Exmo bibliography (2017-06-06)

[achichi2016a] Manel Achichi, Michelle Cheatham, Zlatan Dragisic, Jérôme Euzenat, Daniel Faria, Alfio Ferrara, Giorgos Flouris, Irini Fundulaki, Ian Harrow, Valentina Ivanova, Ernesto Jiménez-Ruiz, Elena Kuss, Patrick Lambrix, Henrik Leopold, Huanyu Li, Christian Meilicke, Stefano Montanelli, Catia Pesquita, Tzanina Saveta, Pavel Shvaiko, Andrea Splendiani, Heiner Stuckenschmidt, Konstantin Todorov, Cássia Trojahn dos Santos, Ond#ej Zamazal,

Results of the Ontology Alignment Evaluation Initiative 2016,

Pavel Shvaiko, Jérôme Euzenat, Ernesto Jiménez-Ruiz, Michelle Cheatham, Oktie Hassanzadeh, Ryutaro Ichise (eds), Proc. 11th ISWC workshop on ontology matching (OM), Kobe (JP), pp73-129, 2016

http://ceur-ws.org/Vol-1766/oaei16_paper0.pdf
http://oaei.ontologymatching.org/2016/results/oaei2016.pdf
https://exmo.inria.fr/files/publications/achichi2016a.pdf

Ontology matching consists of finding correspondences between semantically related entities of two ontologies. OAEI campaigns aim at comparing ontology matching systems on precisely defined test cases. These test cases can use ontologies of different nature (from simple thesauri to expressive OWL ontologies) and use different modalities, e.g., blind evaluation, open evaluation, or consensus. OAEI 2016 offered 9 tracks with 22 test cases, and was attended by 21 participants. This paper is an overall presentation of the OAEI 2016 campaign.

[aguirre2012a] José Luis Aguirre, Bernardo Cuenca Grau, Kai Eckert, Jérôme Euzenat, Alfio Ferrara, Willem Robert van Hage, Laura Hollink, Ernesto Jiménez-Ruiz, Christian Meilicke, Andriy Nikolov, Dominique Ritze, François Scharffe, Pavel Shvaiko, Ond#ej Sváb-Zamazal, Cássia Trojahn dos Santos, Benjamin Zapilko,

Results of the Ontology Alignment Evaluation Initiative 2012,

Pavel Shvaiko, Jérôme Euzenat, Anastasios Kementsietsidis, Ming Mao, Natalya Noy, Heiner Stuckenschmidt (eds), Proc. 7th ISWC workshop on ontology matching (OM), Boston (MA US), pp73-115, 2012

http://ceur-ws.org/Vol-946/oaei12_paper0.pdf
http://oaei.ontologymatching.org/2012/results/oaei2012.pdf
https://exmo.inria.fr/files/publications/aguirre2012a.pdf

Ontology matching consists of finding correspondences between semantically related entities of two ontologies. OAEI campaigns aim at comparing ontology matching systems on precisely defined test cases. These test cases can use ontologies of different nature (from simple thesauri to expressive OWL ontologies) and use different modalities, e.g., blind evaluation, open evaluation, consensus. OAEI 2012 offered 7 tracks with 9 test cases followed by 21 participants. Since 2010, the campaign has been using a new evaluation modality which provides more automation to the evaluation. This paper is an overall presentation of the OAEI 2012 campaign.

[aguirre2012b] José Luis Aguirre, Christian Meilicke, Jérôme Euzenat,

Iterative implementation of services for the automatic evaluation of matching tools (v2),

Deliverable 12.5v2, SEALS, 34p., 2012

https://exmo.inria.fr/files/reports/seals-125v2.pdf

This deliverable reports on the current status of the service implementation for the automatic evaluation of matching tools, and on the final status of those services. These services have been used in the third SEALS evaluation of matching systems, held in Spring 2012 in coordination with the OAEI 2011.5 campaign. We worked mainly on the tasks of modifying the WP12 BPEL work-flow to introduce new features introduced in the RES 1.2 version; testing the modified work-flows on a local installation and on the SEALS Platform; writing transformations of result data to be compliant with the new SEALS ontologies specifications; and finally, extending the SEALS client for ontology matching evaluation for better supporting the automation of WP12 evaluation campaigns and to advance in the integration with SEALS repositories. We report the results obtained while accomplishing these tasks.

[alhulou2002a] Rim Al-Hulou, Olivier Corby, Rose Dieng-Kuntz, Jérôme Euzenat, Carolina Medina Ramirez, Amedeo Napoli, Raphaël Troncy,

Three knowledge representation formalisms for content-based representation of documents,

Proc. KR workshop on Formal ontology, knowledge representation and intelligent systems for the world wide web (SemWeb), Toulouse (FR), 2002

https://exmo.inria.fr/files/publications/alhulou2002.pdf

Documents accessible from the web or from any document base constitute a significant source of knowledge as soon as

the document contents can be represented in an appropriate form. This paper presents the ESCRIRE project, whose objective is to compare three knowledge representation (KR) formalisms, namely conceptual graphs, description logics and objects, for representing and manipulating document contents. The comparison relies on the definition of a pivot language based on XML, allowing the design of a domain ontology, document annotations and queries. Each element has a corresponding translation in each KR formalism, that is used for inferencing and answering queries. In this paper, the principles on which relies the ESCRIRE project and the first results from this original experiment are described. An analysis of problems encountered, advantages and drawbacks of each formalism are studied with the emphasis put on the ontology-based annotations of document contents and on the query answering capabilities.

[albakri2015a] Mustafa Al-Bakri, Manuel Atencia, Steffen Lalande, Marie-Christine Rousset,
Inferring same-as facts from linked data: an iterative import-by-query approach,
Blai Bonet, Sven Koenig (eds), Proc. 29th conference on Conference on Artificial Intelligence (AAAI), Austin (TX US), pp9-15, 2015
https://exmo.inria.fr/files/publications/albakri2015a.pdf
http://www.aaai.org/ocs/index.php/AAAI/AAAI15/paper/view/9508

In this paper we model the problem of data linkage in Linked Data as a reasoning problem on possibly decentralized data. We describe a novel import-by-query algorithm that alternates steps of sub-query rewriting and of tailored querying the Linked Data cloud in order to import data as specific as possible for inferring or contradicting given target same-as facts. Experiments conducted on a real-world dataset have demonstrated the feasibility of this approach and its usefulness in practice for data linkage and disambiguation.

[albakri2016a] Mustafa Al-Bakri, Manuel Atencia, Jérôme David, Steffen Lalande, Marie-Christine Rousset,
Uncertainty-sensitive reasoning for inferring sameAs facts in linked data,
Gal Kaminka, Maria Fox, Paolo Bouquet, Eyke Hüllermeier, Virginia Dignum, Frank Dignum, Frank van Harmelen (eds), Proc. 22nd european conference on artificial intelligence (ECAI), Der Haague (NL), pp698-706, 2016
https://exmo.inria.fr/files/publications/albakri2016a.pdf
http://ebooks.iospress.nl/publication/44816

Discovering whether or not two URIs described in Linked Data -- in the same or different RDF datasets -- refer to the same real-world entity is crucial for building applications that exploit the cross-referencing of open data. A major challenge in data interlinking is to design tools that effectively deal with incomplete and noisy data, and exploit uncertain knowledge. In this paper, we model data interlinking as a reasoning problem with uncertainty. We introduce a probabilistic framework for modelling and reasoning over uncertain RDF facts and rules that is based on the semantics of probabilistic Datalog. We have designed an algorithm, ProbFR, based on this framework. Experiments on real-world datasets have shown the usefulness and effectiveness of our approach for data linkage and disambiguation.

[alkhateeb2005a] Faisal Alkhateeb, Jean-François Baget, Jérôme Euzenat,
Complex path queries for RDF graphs,
Proc. ISWC poster session , Galway (IE), ppPID-52, 2005
https://exmo.inria.fr/files/publications/alkhateeb2005a.pdf

[alkhateeb2007a] Faisal Alkhateeb, Antoine Zimmermann,
Query answering in distributed description logics,
Proc. conference on New technologies, mobility and security (NTMS), Paris (FR), (Houda Labiod, Mohamad Badra (eds), (Proc. conference on New technologies, mobility and security (NTMS)), Springer Verlag, Heidelberg (DE), 2007), pp523-534, 2007
https://exmo.inria.fr/files/publications/alkhateeb2007a.pdf

This paper describes the notion of query answering in a distributed knowledge based system, and gives methods for computing these answers in certain cases. More precisely, given a distributed system (DS) of ontologies and ontology mappings (or bridge rules) written in Distributed Description Logics (DDL), distributed answers are defined for queries written in terms of one particular ontology. These answers may contain individuals from different ABoxes. To compute these answers, the paper provides an algorithm that reduce the problem of distributed query answering to local query answering. This algorithm is proved correct but not complete in the general case.

[alkhateeb2007b] Faisal Alkhateeb, Jean-François Baget, Jérôme Euzenat,
RDF with regular expressions,
Research report 6191, INRIA Rhône-Alpes, Grenoble (FR), 32p., May 2007

http://hal.inria.fr/inria-00144922
https://exmo.inria.fr/files/reports/rr-inria-6191.pdf

RDF is a knowledge representation language dedicated to the annotation of resources within the framework of the semantic web. Among the query languages for querying an RDF knowledge base, some, such as SPARQL, are based on the formal semantics of RDF and the concept of semantic consequence, others, inspired by the work in databases, use regular expressions making it possible to search the paths in the graph associated with the knowledge base. In order to combine the expressivity of these two approaches, we define a mixed language, called PRDF (for "Paths RDF") in which the arcs of a graph can be labeled by regular expressions. We define the syntax and the semantics of these objects, and propose a correct and complete algorithm which, by a kind of homomorphism, calculates the semantic consequence between an RDF graph and a PRDF graph. This algorithm is the heart of query answering for the PSPARQL query language, the extension of the SPARQL query language which we propose and have implemented: a PSPARQL query allows to query an RDF knowledge base using graph patterns whose predicates are regular expressions.

[alkhateeb2007c] Faisal Alkhateeb,
Une extension de RDF avec des expressions régulières,
Actes 8e rencontres nationales sur jeunes chercheurs en inteligence artificielle (RJCIA), Grenoble (FR), pp1-14, 2007

RDF est un langage de représentation de connaissances dédié à l'annotation de ressources dans le cadre du web sémantique. Parmi les langages de requêtes permettant d'interroger une base de connaissances RDF, certains, tels que SPARQL, s'appuient sur la sémantique formelle de RDF et la notion de conséquence sémantique, d'autres, inspirés par des travaux en bases de données, utilisent des expressions régulières permettant de chercher des chemins dans le graphe associé à la base de connaissances. Afin de conjuguer l'expressivité de ces deux approches, nous définissons un langage mixte, appelé PRDF (pour "Paths RDF") dans lequel les arcs d'un graphe peuvent être étiquetés par des expressions régulières. Nous définissons la syntaxe et la sémantique de PRDF, et proposons un algorithme correct et complet qui, par un homomorphisme particulière, calcule la conséquence sémantique entre un graphe RDF et un graphe PRDF. Cet algorithme est au c\oe{}ur de l'extension du langage de requêtes SPARQL que nous proposons et avons implémenté: une requête PSPARQL permet d'interroger une base de connaissances RDF en utilisant des patterns dont les prédicats sont des expressions régulières.

[alkhateeb2007d] Faisal Alkhateeb, Antoine Zimmermann,
Répondre à des requêtes dans un système distribué à base de connaissances,
Yves Demazeau, Jérôme Euzenat, François Jacquenet, Laurent Vercouter (éds), Actes atelier sur Intelligence artificielle et web intelligence (IAWI), Grenoble (FR), ppno pagination, 2007
https://exmo.inria.fr/files/publications/alkhateeb2007d.pdf

Un système distribué à base de connaissances comportent un ensemble d'ontologies, reliée entre elles par des relations sémantiques. Nous nous intéressons aux réponses à une requête posée en termes d'une ontologie d'un tel système. Ces réponses peuvent comporter des individus de différentes ontologies. Pour évaluer ces réponses, nous présentons deux méthodes avec leurs avantages et leurs inconvénients.

[alkhateeb2007e] Faisal Alkhateeb, Jean-François Baget, Jérôme Euzenat,
Constrained regular expressions in SPARQL,
Research report 6360, INRIA Rhône-Alpes, Grenoble (FR), 32p., October 2007
http://hal.inria.fr/inria-00188287
https://exmo.inria.fr/files/reports/rr-inria-6360.pdf

RDF is a knowledge representation language dedicated to the annotation of resources within the Semantic Web. Though RDF itself can be used as a query language for an RDF knowledge base (using RDF consequence), the need for added expressivity in queries has led to the definition of the SPARQL query language. SPARQL queries are defined on top of graph patterns that are basically RDF (and more precisely GRDF) graphs. To be able to characterize paths of arbitrary length in a query (e.g., "does there exist a trip from town A to town B using only trains and buses?"), we have already proposed the PRDF (for Path RDF) language, effectively mixing RDF reasonings with database-inspired regular paths. However, these queries do not allow expressing constraints on the internal nodes (e.g., "Moreover, one of the stops must provide a wireless connection."). To express these constraints, we present here an extension of RDF, called CPRDF (for Constrained paths RDF). For this extension of RDF, we provide an abstract syntax and an extension of RDF semantics. We characterize query answering (the query is a CPRDF graph, the knowledge base is an RDF graph) as a particular case of CPRDF entailment that can be computed using some kind of graph homomorphism. Finally, we use CPRDF graphs to generalize SPARQL graph patterns, defining the CPSPARQL extension of that query language, and prove that the problem of query answering using only CPRDF graphs is an NP-hard problem, and query answering thus remains a PSPACE-complete problem for CPSPARQL.

[alkhateeb2008a] Faisal Alkhateeb, Jean-François Baget, Jérôme Euzenat,

Constrained regular expressions in SPARQL,
Hamid Arabnia, Ashu Solo (eds), Proc. international conference on semantic web and web services (SWWS), Las Vegas (NV US), pp91-99, 2008
https://exmo.inria.fr/files/publications/alkhateeb2008a.pdf

We have proposed an extension of SPARQL, called PSPARQL, to characterize paths of variable lengths in an RDF knowledge base (e.g. "Does there exists a trip from town A to town B?"). However, PSPARQL queries do not allow expressing constraints on internal nodes (e.g. "Moreover, one of the stops must provide a wireless access."). This paper proposes an extension of PSPARQL, called CPSPARQL, that allows expressing constraints on paths. For this extension, we provide an abstract syntax, semantics as well as a sound and complete inference mechanism for answering CPSPARQL queries.

[alkhateeb2008b] Faisal Alkhateeb,
Querying RDF(S) with regular expressions,
Thèse d'informatique, Université Joseph Fourier, Grenoble (FR), June 2008
https://exmo.inria.fr/files/thesis/thesis-alkhateeb.pdf

RDF is a knowledge representation language dedicated to the annotation of resources within the Semantic Web. Though RDF itself can be used as a query language for an RDF knowledge base (using RDF semantic consequence), the need for added expressivity in queries has led to define the SPARQL query language. SPARQL queries are defined on top of graph patterns that are basically RDF graphs with variables. SPARQL queries remain limited as they do not allow queries with unbounded sequences of relations (e.g. "does there exist a trip from town A to town B using only trains or buses?"). We show that it is possible to extend the RDF syntax and semantics defining the PRDF language (for Path RDF) such that SPARQL can overcome this limitation by simply replacing the basic graph patterns with PRDF graphs, effectively mixing RDF reasoning with database-inspired regular paths. We further extend PRDF to CPRDF (for Constrained Path RDF) to allow expressing constraints on the nodes of traversed paths (e.g. "Moreover, one of the correspondences must provide a wireless connection."). We have provided sound and complete algorithms for answering queries (the query is a PRDF or a CPRDF graph, the knowledge base is an RDF graph) based upon a kind of graph homomorphism, along with a detailed complexity analysis. Finally, we use PRDF or CPRDF graphs to generalize SPARQL graph patterns, defining the PSPARQL and CPSPARQL extensions, and provide experimental tests using a complete implementation of these two query languages.

[alkhateeb2008c] Faisal Alkhateeb, Sébastien Laborie,
Towards extending and using SPARQL for modular document generation,
Proc. 8th ACM symposium on document engineering (DocEng), São Paolo (BR), pp164-172, 2008
https://exmo.inria.fr/files/publications/alkhateeb2008c.pdf

RDF is one of the most used languages for resource description and SPARQL has become its standard query language. Nonetheless, SPARQL remains limited to generate automatically documents from RDF repositories, as it can be used to construct only RDF documents. We propose in this paper an extension to SPARQL that allows to generate any kind of XML documents from multiple RDF data and a given XML template. Thanks to this extension, an XML template can itself contain SPARQL queries that can import template instances. Such an approach allows to reuse templates, divide related information into various templates and avoid templates containing mixed languages. Moreover, reasoning capabilities can be exploited using RDF Schema or simply RDFS.

[alkhateeb2009a] Faisal Alkhateeb, Jean-François Baget, Jérôme Euzenat,
Extending SPARQL with regular expression patterns (for querying RDF),
Journal of web semantics 7(2):57-73, 2009
https://exmo.inria.fr/files/publications/alkhateeb2009a.pdf

RDF is a knowledge representation language dedicated to the annotation of resources within the framework of the semantic web. Among the query languages for RDF, SPARQL allows querying RDF through graph patterns, i.e., RDF graphs involving variables. Other languages, inspired by the work in databases, use regular expressions for searching paths in RDF graphs. Each approach can express queries that are out of reach of the other one. Hence, we aim at combining these two approaches. For that purpose, we define a language, called PRDF (for "Path RDF") which extends RDF such that the arcs of a graph can be labeled by regular expression patterns. We provide PRDF with a semantics extending that of RDF, and propose a correct and complete algorithm which, by computing a particular graph homomorphism, decides the consequence between an RDF graph and a PRDF graph. We then define the PSPARQL query language, extending SPARQL with PRDF graph patterns and complying with RDF model theoretic semantics. PRDF thus offers both graph patterns and path expressions. We show that this extension does not increase the computational complexity of SPARQL and, based on the proposed algorithm, we have implemented a correct and complete PSPARQL query engine.

[alkhateeb2012a] Faisal Alkhateeb, Jérôme Euzenat,

Querying RDF data,
In: Sherif Sakr, Eric Pardede (eds), Graph data management: techniques and applications, IGI Global, Hershey (PA US), 2012, pp337-356
http://www.igi-global.com/chapter/querying-rdf-data/58618

This chapter provides an introduction to the RDF language as well as surveys the languages that can be used for querying RDF graphs. Then it reviews some of the languages that can be used for querying RDF and provides a comparison between these query languages.

[alkhateeb2013a] Faisal Alkhateeb, Jérôme Euzenat,
Answering SPARQL queries modulo RDF Schema with paths,
Research report 8394, INRIA Rhône-Alpes, Grenoble (FR), 46p., November 2013
http://hal.inria.fr/hal-00904961
https://exmo.inria.fr/files/reports/rr-inria-8394.pdf
http://arxiv.org/abs/1311.3879

SPARQL is the standard query language for RDF graphs. In its strict instantiation, it only offers querying according to the RDF semantics and would thus ignore the semantics of data expressed with respect to (RDF) schemas or (OWL) ontologies. Several extensions to SPARQL have been proposed to query RDF data modulo RDFS, i.e., interpreting the query with RDFS semantics and/or considering external ontologies. We introduce a general framework which allows for expressing query answering modulo a particular semantics in an homogeneous way. In this paper, we discuss extensions of SPARQL that use regular expressions to navigate RDF graphs and may be used to answer queries considering RDFS semantics. We also consider their embedding as extensions of SPARQL. These SPARQL extensions are interpreted within the proposed framework and their drawbacks are presented. In particular, we show that the PSPARQL query language, a strict extension of SPARQL offering transitive closure, allows for answering SPARQL queries modulo RDFS graphs with the same complexity as SPARQL through a simple transformation of the queries. We also consider languages which, in addition to paths, provide constraints. In particular, we present and compare nSPARQL and our proposal CPSPARQL. We show that CPSPARQL is expressive enough to answer full SPARQL queries modulo RDFS. Finally, we compare the expressiveness and complexity of both nSPARQL and the corresponding fragment of CPSPARQL, that we call cpSPARQL. We show that both languages have the same complexity through cpSPARQL, being a proper extension of SPARQL graph patterns, is more expressive than nSPARQL.

[alkhateeb2014a] Faisal Alkhateeb, Jérôme Euzenat,
Constrained regular expressions for answering RDF-path queries modulo RDFS,
International Journal of Web Information Systems 10(1):24-50, 2014
http://www.emeraldinsight.com/journals.htm?issn=1744-0084&volume=10&issue=1&articleid=17107

The standard SPARQL query language is currently defined for querying RDF graphs without RDFS semantics. Several extensions of SPARQL to RDFS semantics have been proposed. In this paper, we discuss extensions of SPARQL that use regular expressions to navigate RDF graphs and may be used to answer queries considering RDFS semantics. In particular, we present and compare nSPARQL and our proposal CPSPARQL. We show that CPSPARQL is expressive enough to answer full SPARQL queries modulo RDFS. Finally, we compare the expressiveness and complexity of both nSPARQL and the corresponding fragment of CPSPARQL, that we call cpSPARQL. We show that both languages have the same complexity through cpSPARQL, being a proper extension of SPARQL graph patterns, is more expressive than nSPARQL.

[ashpole2005a] Benjamin Ashpole, Marc Ehrig, Jérôme Euzenat, Heiner Stuckenschmidt (eds),
Proceedings K-Cap workshop on integrating ontologies (Proc. K-Cap workshop on integrating ontologies),
105p., 2005
http://ceur-ws.org/Vol-156/
https://exmo.inria.fr/files/reports/KCap2005-intont.pdf

[atencia2011a] Manuel Atencia, Jérôme Euzenat, Giuseppe Pirrò, Marie-Christine Rousset,
Alignment-based trust for resource finding in semantic P2P networks,
Proc. 10th conference on International semantic web conference (ISWC), Bonn (DE), (Lora Aroyo, Christopher Welty, Harith Alani, Jamie Taylor, Abraham Bernstein, Lalana Kagal, Natalya Noy, Eva Blomqvist (eds), The semantic web (Proc. 10th conference on International semantic web conference (ISWC)), *Lecture notes in computer science* 7031, 2011), pp51-66, 2011
https://exmo.inria.fr/files/publications/atencia2011a.pdf

In a semantic P2P network, peers use separate ontologies and rely on alignments between their ontologies for

translating queries. Nonetheless, alignments may be limited -unsound or incomplete- and generate flawed translations, leading to unsatisfactory answers. In this paper we present a trust mechanism that can assist peers to select those in the network that are better suited to answer their queries. The trust that a peer has towards another peer depends on a specific query and represents the probability that the latter peer will provide a satisfactory answer. We have implemented the trust technique and conducted an evaluation. Experimental results showed that trust values converge as more queries are sent and answers received. Furthermore, the use of trust brings a gain in query-answering performance.

[atencia2011b] Manuel Atencia, Jérôme Euzenat, Marie-Christine Rousset,
Exploiting ontologies and alignments for trust in semantic P2P networks,
Research report 18, LIG, Grenoble (FR), 10p., June 2011
https://exmo.inria.fr/files/reports/rr-lig-018.pdf

In a semantic P2P network, peers use separate ontologies and rely on alignments between their ontologies for translating queries. However, alignments may be limited unsound or incomplete and generate flawed translations, and thereby produce unsatisfactory answers. In this paper we propose a trust mechanism that can assist peers to select those in the network that are better suited to answer their queries. The trust that a peer has towards another peer is subject to a specific query and approximates the probability that the latter peer will provide a satisfactory answer. In order to compute trust, we exploit the information provided by peers' ontologies and alignments, along with the information that comes from peers' experience. Trust values are refined over time as more queries are sent and answers received, and we prove that these approximations converge.

[atencia2012a] Manuel Atencia, Marco Schorlemmer,
An interaction-based approach to semantic alignment,
Journal of web semantics 13:131-147, 2012

We tackle the problem of semantic heterogeneity in the context of agent communication and argue that solutions based solely on ontologies and ontology matching do not capture adequately the richness of semantics as it arises in dynamic and open multiagent systems. Current solutions to the semantic heterogeneity problem in distributed systems usually do not address the contextual nuances of the interaction underlying an agent communication. The meaning an agent attaches to its utterances is, in our view, very relative to the particular dialogue in which it may be engaged, and that the interaction model specifying its dialogical structure and its unfolding should not be left out of the semantic alignment mechanism. In this article we provide the formal foundation of a novel, interaction-based approach to semantic alignment, drawing from a mathematical construct inspired from category theory that we call the communication product. In addition, we describe a simple alignment protocol which, combined with a probabilistic matching mechanism, endows an agent with the capacity of bootstrapping --by repeated successful interaction-- the basic semantic relationship between its local vocabulary and that of another agent. We have also implemented the alignment technique based on this approach and prove its viability by means of an abstract experimentation and a thorough statistical analysis.

[atencia2012b] Manuel Atencia, Jérôme David, François Scharffe,
Keys and pseudo-keys detection for web datasets cleansing and interlinking,
Proc. 18th international conference on knowledge engineering and knowledge management (EKAW), Galway (IE), (Annette ten Teije, Johanna Voelker, Siegfried Handschuh, Heiner Stuckenschmidt, Mathieu d'Aquin, Andriy Nikolov, Nathalie Aussenac-Gilles, Nathalie Hernandez (eds), Knowledge engineering and knowledge management, *Lecture notes in computer science* 7603, 2012), pp144-153, 2012
https://exmo.inria.fr/files/publications/atencia2012b.pdf

This paper introduces a method for analyzing web datasets based on key dependencies. The classical notion of a key in relational databases is adapted to RDF datasets. In order to better deal with web data of variable quality, the definition of a pseudo-key is presented. An RDF vocabulary for representing keys is also provided. An algorithm to discover keys and pseudo-keys is described. Experimental results show that even for a big dataset such as DBpedia, the runtime of the algorithm is still reasonable. Two applications are further discussed: (i) detection of errors in RDF datasets, and (ii) datasets interlinking.

[atencia2012c] Manuel Atencia, Alexander Borgida, Jérôme Euzenat, Chiara Ghidini, Luciano Serafini,
A formal semantics for weighted ontology mappings,
Proc. 11th conference on International semantic web conference (ISWC), Boston (MA US), (Philippe Cudré-Mauroux, Jeff Heflin, Evren Sirin, Tania Tudorache, Jérôme Euzenat, Manfred Hauswirth, Josiane Xavier Parreira, James Hendler, Guus Schreiber, Abraham Bernstein, Eva Blomqvist (eds), The semantic web (Proc. 11th conference on International semantic web conference (ISWC)), *Lecture notes in*

computer science 7649, 2012), pp17-33, 2012
https://exmo.inria.fr/files/publications/atencia2012c.pdf

Ontology mappings are often assigned a weight or confidence factor by matchers. Nonetheless, few semantic accounts have been given so far for such weights. This paper presents a formal semantics for weighted mappings between different ontologies. It is based on a classificational interpretation of mappings: if O1 and O2 are two ontologies used to classify a common set X, then mappings between O1 and O2 are interpreted to encode how elements of X classified in the concepts of O1 are re-classified in the concepts of O2, and weights are interpreted to measure how precise and complete re-classifications are. This semantics is justifiable by extensional practice of ontology matching. It is a conservative extension of a semantics of crisp mappings. The paper also includes properties that relate mapping entailment with description logic constructors.

[atencia2015a] Manuel Atencia, Mustafa Al-Bakri, Marie-Christine Rousset,
Trust in networks of ontologies and alignments,
Knowledge and Information Systems 42(2):353-379, 2015

In this paper, we introduce a mechanism of trust adapted to semantic peer-to-peer networks in which every peer is free to organize its local resources as instances of classes of its own ontology. Peers use their ontologies to query other peers, and alignments between peers' ontologies make it possible to reformulate queries from one local peer's vocabulary to another. Alignments are typically the result of manual or (semi)automatic ontology matching. However, resulting alignments may be unsound and/or incomplete, and therefore, query reformulation based on alignments may lead to unsatisfactory answers. Trust can assist peers to select the peers in the network that are better suited to answer their queries. In our model, the trust that a peer has toward another peer depends on a specific query, and it represents the probability that the latter peer will provide a satisfactory answer to the query. In order to compute trust, we perform Bayesian inference that exploits ontologies, alignments and user feedback. We have implemented our method and conducted an evaluation. Experimental results show that trust values converge as more queries are sent and answers received. Furthermore, when query answering is guided by trust, the quality of peers' answers, measured with precision and recall, is improved.

[atencia2014b] Manuel Atencia, Jérôme David, Jérôme Euzenat,
Data interlinking through robust linkkey extraction,
Torsten Schaub, Gerhard Friedrich, Barry O'Sullivan (eds), Proc. 21st european conference on artificial intelligence (ECAI), Praha (CZ), pp15-20, 2014
https://exmo.inria.fr/files/publications/atencia2014b.pdf

Links are important for the publication of RDF data on the web. Yet, establishing links between data sets is not an easy task. We develop an approach for that purpose which extracts weak linkkeys. Linkkeys extend the notion of a key to the case of different data sets. They are made of a set of pairs of properties belonging to two different classes. A weak linkkey holds between two classes if any resources having common values for all of these properties are the same resources. An algorithm is proposed to generate a small set of candidate linkkeys. Depending on whether some of the, valid or invalid, links are known, we define supervised and non supervised measures for selecting the appropriate linkkeys. The supervised measures approximate precision and recall, while the non supervised measures are the ratio of pairs of entities a linkkey covers (coverage), and the ratio of entities from the same data set it identifies (discrimination). We have experimented these techniques on two data sets, showing the accuracy and robustness of both approaches.

[atencia2014c] Manuel Atencia, Michel Chein, Madalina Croitoru, Jérôme David, Michel Leclère, Nathalie Pernelle, Fatiha Saïs, François Scharffe, Danai Symeonidou,
Defining key semantics for the RDF datasets: experiments and evaluations,
Proc. 21st conference on International Conference on Conceptual Structures (ICCS), Iasi (RO), (Graph-Based Representation and Reasoning (Proc. 21st conference on International Conference on Conceptual Structures (ICCS)), *Lecture notes in artificial intelligence* 8577, 2014), pp65-78, 2014
https://exmo.inria.fr/files/publications/atencia2014c.pdf

Many techniques were recently proposed to automate the linkage of RDF datasets. Predicate selection is the step of the linkage process that consists in selecting the smallest set of relevant predicates needed to enable instance comparison. We call keys this set of predicates that is analogous to the notion of keys in relational databases. We explain formally the different assumptions behind two existing key semantics. We then evaluate experimentally the keys by studying how discovered keys could help dataset interlinking or cleaning. We discuss the experimental results and show that the two different semantics lead to comparable results on the studied datasets.

[atencia2014d] Manuel Atencia, Jérôme David, Jérôme Euzenat,
What can FCA do for database linkkey extraction?,

Proc. 3rd ECAI workshop on What can FCA do for Artificial Intelligence? (FCA4AI), Praha (CZ), pp85-92, 2014
http://ceur-ws.org/Vol-1257/paper10.pdf
https://exmo.inria.fr/files/publications/atencia2014d.pdf

Links between heterogeneous data sets may be found by using a generalisation of keys in databases, called linkkeys, which apply across data sets. This paper considers the question of characterising such keys in terms of formal concept analysis. This question is natural because the space of candidate keys is an ordered structure obtained by reduction of the space of keys and that of data set partitions. Classical techniques for generating functional dependencies in formal concept analysis indeed apply for finding candidate keys. They can be adapted in order to find database candidate linkkeys. The question of their extensibility to the RDF context would be worth investigating.

[aubert2006a] Jean-Pierre Aubert, Jean-François Baget, Michel Chein,
Simple concept graphs and simple conceptual graphs,
Proc. 14th international conference on conceptual structure (ICCS), Aalborg (DK), (Henrik Schärfe, Pascal Hitzler, Peter Ohrstrom (eds), , *Lecture notes in computer science* 4068, 2006), pp87-101, 2006

[baget2003a] Jean-François Baget,
Simple conceptual graphs revisited: hypergraphs and conjunctive types for efficient projection algorithms,
Proc. 11th international conference on conceptual sructures (ICCS), Dresden (DE), (Aldo De Moor, Wilfried Lex, Bernhard Ganther (eds), Conceptual structures for knowledge creation and communication, *Lecture notes in computer science* 2746, 2003), pp229-242, 2003
https://exmo.inria.fr/files/publications/baget2003a.pdf

Simple Conceptual Graphs (SGs) form the cornerstone for the "Conceptual Graphs" family of languages. In this model, the subsumptio operation is called projection; it is a labelled graphs homomorphism (a NP-hard problem). Designing efficient algorithms to compute projections between two SGs is thus of uttermost importance for the community building languages on top of this basic model. This paper presents some such algorithms, inspired by those developped for Constraint Satisfaction Problems. In order to benefit from the optimization work done in this community, we have chosen to present an alternate version of SGs, differences being the definition of these graphs as hypergraphs and the use of conjunctive types.

[baget2003b] Jean-François Baget, Étienne Canaud, Jérôme Euzenat, Mohand Saïd-Hacid,
Les langages du web sémantique,
Rapport final, Action spécifique CNRS/STIC « Web sémantique », 2003
https://exmo.inria.fr/files/publications/baget2003b.pdf

La manipulation des resources du web par des machines requiert l'expression ou la description de ces resources. Plusieurs langages sont donc définis à cet effet, ils doivent permettre d'exprimer données et méthadonnées (RDF, Cartes Topiques), de décrire les services et leur fonctionnement (UDDI, WSDL, DAML-S, etc.) et de disposer d'un modèle abstrait de ce qui est décrit grace à l'expression d'ontologies (RDFS, OWL). On présente ci-dessous l'état des travaux visant à doter le web sémantique de tels langages. On évoque aussi les questions importantes qui ne sont pas réglées à l'heure actuelle et qui méritent de plus amples travaux.

[baget2003c] Jean-François Baget,
Homomorphismes d'hypergraphes pour la subsomption en RDF,
Actes 3e journées nationales sur modèles de raisonnement (JNMR), Paris (FR), pp1-24, 2003
https://exmo.inria.fr/files/publications/baget2003c.pdf

[baget2004a] Jean-François Baget,
Homomorphismes d'hypergraphes pour la subsomption en RDF/RDFS,
Actes 10e conférence sur langages et modèles à objets (LMO), Lille (FR), (Jérôme Euzenat, Bernard Carré (éds), Langages et modèles à objets 2004 (actes 10e conférence), *RSTI - L'objet* (numéro spécial) 10(2-3):1-275, 2004), pp203-216, 2004
https://exmo.inria.fr/files/publications/baget2004a.pdf

RDFS is a knowledge representation language developped for the Semantic Web by the World Wide Web Consortium (W3C). Objects of this language (labelled graphs) are given formal model-theoretic semantics, allowing to define the subsumption relation between RDFS documents. In this paper, we reformulate subsumption into a kind of labelled hypergraphs homomorphism called projection. The huge similarities between this projection and the one defined for

conceptual graphs allow us to translate many theoretical results and algorithms.

[baget2004b] Jean-François Baget,
Improving the Forward Chaining Algorithm for Conceptual Graphs Rules,
Didier Dubois, Christopher Welty, Mary-Anne Williams (eds), Proc. 9th international conference on principles of knowledge representation and reasoning (KR), Whistler (CA), pp407-414, 2004
https://exmo.inria.fr/files/publications/baget2004b.pdf

Simple Conceptual Graphs (SGs) are used to represent entities and relations between these entities: they can be translated into positive, conjunctive, existential first-order logics, without function symbols. Sound and complete reasonings w.r.t. associated logic formulas are obtained through a kind of graph homomorphism called projection. Conceptual Graphs Rules (or CG rules) are a standard extension to SGs, keeping sound and complete reasonings w.r.t. associated logic formulas (they have the same form as tuple generating dependencies in database): these graphs represent knowledge of the form ``IF ... THEN''. We present here an optimization of the natural forward chaining algorithm for CG rules. Generating a graph of rules dependencies makes the following sequences of rule applications far more efficient, and the structure of this graph can be used to obtain new decidability results.

[baget2004c] Jean-François Baget, Étienne Canaud, Jérôme Euzenat, Mohand Saïd-Hacid,
Les langages du web sémantique,
Information-Interaction-Intelligence HS2004, 2004
https://www.irit.fr/journal-i3/hors_serie/annee2004/revue_i3_hs2004_01_02.pdf
https://exmo.inria.fr/files/publications/baget2004c.pdf

La manipulation des resources du web par des machines requiert l'expression ou la description de ces resources. Plusieurs langages sont donc définis à cet effet, ils doivent permettre d'exprimer données et méthadonnées (RDF, Cartes Topiques), de décrire les services et leur fonctionnement (UDDI, WSDL, DAML-S, etc.) et de disposer d'un modèle abstrait de ce qui est décrit grace à l'expression d'ontologies (RDFS, OWL). On présente ci-dessous l'état des travaux visant à doter le web sémantique de tels langages. On évoque aussi les questions importantes qui ne sont pas réglées à l'heure actuelle et qui méritent de plus amples travaux.

[baget2005a] Jean-François Baget,
RDF Entailment as a Graph Homomorphism,
Proc. 4th conference on international semantic web conference (ISWC), Galway (EI), (Yolanda Gil, Enrico Motta, Richard Benjamins, Mark Musen (eds), The semantic web - ISWC 2005, *Lecture notes in computer science* 3729, 2005), pp82-96, 2005
https://exmo.inria.fr/files/publications/baget2005a.pdf

Semantic consequence (entailment) in RDF is ususally computed using Pat Hayes Interpolation Lemma. In this paper, we reformulate this mechanism as a graph homomorphism known as projection in the conceptual graphs community. Though most of the paper is devoted to a detailed proof of this result, we discuss the immediate benefits of this reformulation: it is now easy to translate results from different communities (e.g. conceptual graphs, constraint programming,...) to obtain new polynomial cases for the NP-complete RDF entailment problem, as well as numerous algorithmic optimizations.

[baget2006a] Jean-François Baget, Olivier Carloni, Michel Chein, David Genest, Alain Gutierrez, Michel Leclère, Marie-Laure Mugnier, Éric Salvat, Rallou Thomopoulos,
Towards benchmarks for conceptual graphs tools,
Proc. 1st ICCS workshop on Conceptual Structures Tool Interoperability (CS-TIW), Aalborg (DK), (Aldo De Moor, Simon Polovina, Harry Delugach (eds), (Proc. 1st ICCS workshop on Conceptual Structures Tool Interoperability (CS-TIW)), 2006), pp72-86, 2006
http://www.lirmm.fr/~baget/publications/CSTIW06.pdf

This paper reports a collective reflection led in our team about conceptual graph benchmarks. We tackle four issues for which agreement should be obtained before benchmarks can be built: what are the fragments of CGs considered? How is information exchanged? What are the problems to be solved? What kinds of tool properties are evaluated by the benchmarks? We define a basic building block built upon simple conceptual graphs. Finally we propose to provide a first benchmark adapted from an industrial case study. This benchmark is composed on very simple structures and should allow to focus on interoperability issues.

[baget2006b] Jean-François Baget, Éric Salvat,
Rules dependencies in backward chaining of conceptual graphs rules,
Proc. 14th international conference on conceptual structure (ICCS), Aalborg (DK), (Henrik Schärfe,

Pascal Hitzler, Peter Ohrstrom (eds), , *Lecture notes in computer science* 4068, 2006), pp102-116, 2006
http://link.springer.com/content/pdf/10.1007/11787181_8.pdf

Conceptual Graphs Rules were proposed as an extension of Simple Conceptual Graphs (CGs) to represent knowledge of form "if A then B", where A and B are simple CGs. Optimizations of the deduction calculus in this KR formalism include a Backward Chaining that unifies at the same time whole subgraphs of a rule, and a Forward Chaining that relies on compiling dependencies between rules. In this paper, we show that the unification used in the first algorithm is exactly the operation required to compute dependencies in the second one. We also combine the benefits of the two approaches, by using the graph of rules dependencies in a Backward Chaining framework.

[baget2007a] Jean-François Baget, Sébastien Laborie,
Bi-intervals for backtracking on temporal constraint networks,
Proc. 14th international conference on temporal representation and reasoning (TIME), Alicante (SP), (Valentin Goranko, Sean Wang (eds), (Proc. 14th international conference on temporal representation and reasoning (TIME)), IEEE Computer society, Los Alamitos (CA), 2007), pp163-168, 2007
https://exmo.inria.fr/files/publications/baget2007a.pdf

Checking satisfiability of temporal constraint networks involves infinite variables domains. We explore a solution based upon finite partitions of infinite domains. Though a straightforward partition results in a sound and complete backtrack, its extension to forward checking is not complete. Using bi-intervals, we obtain sound and complete backtrack and forward checking algorithms. Moreover, we show that bi-intervals used in a hybrid algorithm which also instantiates constraints improve backtrack efficiency.

[bezerra2008a] Camila Bezerra, Frederico Freitas, Jérôme Euzenat, Antoine Zimmermann,
ModOnto: A tool for modularizing ontologies,
Proc. 3rd workshop on ontologies and their applications (Wonto), Salvador de Bahia (Bahia BR), (26 October) 2008
https://exmo.inria.fr/files/publications/bezerra2008a.pdf
http://ceur-ws.org/Vol-427/paper3.pdf

During the last three years there has been growing interest and consequently active research on ontology modularization. This paper presents a concrete tool that incorporates an approach to ontology modularization that inherits some of the main principles from object-oriented software engineering, which are encapsulation and information hiding. What motivated us to track that direction is the fact that most ontology approaches to the problem focus on linking ontologies (or modules) rather than building modules that can encapsulate foreign parts of ontologies (or other modules) that can be managed more easily.

[bezerra2009a] Camila Bezerra, Frederico Freitas, Jérôme Euzenat, Antoine Zimmermann,
An approach for ontology modularization,
Proc. Brazil/INRIA colloquium on computation: cooperations, advances and challenges (Colibri), Bento-Conçalves (BR), pp184-189, 2009
https://exmo.inria.fr/files/publications/bezerra2009a.pdf

Ontology modularization could help overcome the problem of defining a fragment of an existing ontology to be reused, in order to enable ontology developers to include only those concepts and relations that are relevant for the application they are modeling an ontology for. This paper presents a concrete tool that incorporates an approach to ontology modularization that inherits some of the main principles from object-oriented softwareengineering, which are encapsulation and information hiding. What motivated us to track that direction is the fact that most ontology approaches to the problem focus on linking ontologies rather than building modules that can encapsulate foreign parts of ontologies (or other modules) that can be managed more easily.

[birov2014a] Strahil Birov, Simon Robinson, María Poveda Villalón, Mari Carmen Suárez-Figueroa, Raúl García Castro, Jérôme Euzenat, Luz Maria Priego, Bruno Fies, Andrea Cavallaro, Jan Peters-Anders, Thanasis Tryferidis, Kleopatra Zoi Tsagkari,
Ontologies and datasets for energy measurement and validation interoperability,
Deliverable 3.2, Ready4SmartCities, 72p., September 2014
https://exmo.inria.fr/files/reports/r4sc-32.pdf

[birov2015a] Strahil Birov, Simon Robinson, María Poveda Villalón, Mari Carmen Suárez-Figueroa, Raúl García Castro, Jérôme Euzenat, Bruno Fies, Andrea Cavallaro, Jan Peters-Anders, Thanasis Tryferidis, Kleopatra Zoi Tsagkari,

Ontologies and datasets for energy measurement and validation interoperability,
Deliverable 3.3, Ready4SmartCities, 135p., September 2015
https://exmo.inria.fr/files/reports/r4sc-33.pdf

[blomqvist2009a] Eva Blomqvist, Kurt Sandkuhl, François Scharffe, Vojtech Svátek (eds),
(Proc. 1st ISWC workshop on Ontology pattern (WOP)),
193p., 2009
http://ceur-ws.org/Vol-516/

[bouge2000a] Patrick Bougé, Dominique Deneux, Christophe Lerch, Jérôme Euzenat, Jean-Paul Barthès, Michel Tollenaere,
Localisation des connaissances dans les systèmes de production: approches multiples pour différents types de connaissance,
Jacques Perrin, René Soënen (éds), Actes journées Prosper sur Gestion de connaissances, coopération, méthodologie de recherches interdisciplinaires, Toulouse (FR), pp31-50, 2000
https://exmo.inria.fr/files/publications/bouge2000a.pdf
https://exmo.inria.fr/files/publications/bouge2000a.ps.gz

La gestion des connaissances s'instancie de manière extrèmement variée au sein des entreprises et elle mobilise des disciplines tout aussi variées. Les connaissances considérées par les différentes approches peuvent être très différentes. On peut se demander si cet état de fait est dû aux approches mises en oeuvre ou exigé par la variété des applications englobées par la gestion de connaissance. On considère un ensemble de projets pouvant être considérés comme relevant de la gestion de connaissance restreinte au cadre des systèmes de productions. On observe tout d'abord qu'ils s'attachent à résoudre des problèmes différents par des méthodes différentes. De plus, la corrélation semble faible entre les disciplines et les connaissances d'une part et entre les problèmes et les disciplines d'autre part.

[bouquet2004a] Paolo Bouquet, Jérôme Euzenat, Enrico Franconi, Luciano Serafini, Giorgos Stamou, Sergio Tessaris,
Specification of a common framework for characterizing alignment,
Deliverable 2.2.1, Knowledge web, 21p., June 2004
https://exmo.inria.fr/files/reports/kweb-221.pdf

[bouquet2007a] Paolo Bouquet, Jérôme Euzenat, Chiara Ghidini, Deborah McGuinness, Valeria de Paiva, Luciano Serafini, Pavel Shvaiko, Holger Wache (eds),
(Proc. 3rd Context workshop on Context and ontologies: representation and reasoning (C&O:RR)),
77p., 2007
Also Roskilde University report RU/CS/RR 115
http://ceur-ws.org/Vol-298/
http://www.c-and-o.net
https://exmo.inria.fr/files/reports/Context2007-CORR-ws.pdf

[bouquet2008a] Paolo Bouquet, Jérôme Euzenat, Chiara Ghidini, Deborah McGuinness, Valeria de Paiva, Gulin Qi, Luciano Serafini, Pavel Shvaiko, Holger Wache, Alain Léger (eds),
(Proc. 4th ECAI workshop on Context and ontologies (C&O)),
38p., 2008
http://ceur-ws.org/Vol-390/
http://www.c-and-o.net
https://exmo.inria.fr/files/reports/ECAI2008-cando-ws.pdf

[brunet2000b] Olivier Brunet,
Classifications et treillis,
Actes 5e Rencontres nationales sur de jeunes chercheurs en intelligence artificielle (RJCIA), Lyon (FR), pp29-38, 2000
https://exmo.inria.fr/files/publications/brunet2000b.pdf
https://exmo.inria.fr/files/publications/brunet2000b.ps.gz

Nous présentons un formalisme de traduction de l'Information Flow Theory, une théorie de représentation des transferts d'information développée par J. Barwise et J. Seligman, vers un formalisme standard de correspondances de Galois.

Nous donnons certaines propriétés de cette traduction et montrons que celle-ci est totale et injective mais non surjective, ce qui signifie que cette théorie se traduit exactement sous forme de treillis et de correspondances de Galois mais que l'on peut l'enrichir en utilisant ce formalisme.

[brunet2000a] Olivier Brunet,
Lattice approach to classifications,
Proc. 12th European summer school on logic, language and information (ESSLLI), Birmimgham (UK), pp34-44, 2000
https://exmo.inria.fr/files/publications/brunet2000a.pdf
https://exmo.inria.fr/files/publications/brunet2000a.ps.gz

We present a translation of J. Barwise and J. Seligman's "Information Flow Theory" into a lattice and Galois connection based formalism. We show how to transform the different structures of the theory into this formalism and show that this translation extends the expressivity of the theory.

[brunet2001a] Olivier Brunet,
A model for knowledge representation in distributed systems,
Proc. KI workshop on Modal Logic in AI, Wien (AT), pp3-12, 2001
https://exmo.inria.fr/files/publications/brunet2001a.pdf

[brunet2002a] Olivier Brunet,
A modal logic for observation-based knowledge representation,
Proc. FLoC workshop on Intuitionistic modal logic and applications (IMLA 2002), Copenhagen (DK), (Rajeev Goré, Michael Mendler, Valeria de Paiva (eds), Intuitionistic modal logic and applications, Technical report 61, Bamberger Beitrage zur Wirtschaftsinformatik und Angewandten Informatik, Bamberg (DE), 2002), pp69-81, 2002
https://exmo.inria.fr/files/publications/brunet2002a.pdf

In this paper, we introduce and explore ways to include a notion of partiality of information in knowledge representation formalisms. This leads to the definition of an algebraic structure based on observation and partial representation, and to the study of the logical behaviour of those structures, with the characterization of a new modal logic called OL.

[brunet2002b] Olivier Brunet,
Étude de la connaissance dans le cadre d'observations partielles: la logique de l'observation,
Thèse d'informatique, Université Joseph Fourier, Grenoble (FR), 212p., octobre 2002
https://exmo.inria.fr/files/thesis/these-brunet.pdf

On s'intéresse à la connaissance que l'on peut avoir d'un système en se basant uniquement sur des observations que l'on peut en faire et où certaines informations peuvent rester cachées. On peut structurer ces observations en comparant leur contenu et la quantité d'informations qu'elles fournissent, pour obtenir ce que nous nommons des représentations. On peut de plus étudier les relations existant entre les différentes façons d'observer un même système, pour obtenir certaines fonctions reliant les représentations entre elles. Avec ce formalisme, on se livre à une étude logique du comportement de l'information pour cette approche. Le premier résultat est que l'on se base sur la logique intuitionniste, puisque les propositions que l'on considère expriment des connaissances sûres, et que l'ajout d'information n'en modifie pas la véracité. On étend cette logique en utilisant des opérateurs "modaux" pour symboliser les différentes façons d'observer le système et exprimer le fait qu'une information est accessible ou non depuis le point de vue correspondant. Suivant les contraintes que l'on impose, on obtient plusieurs comportements de ces opérateurs dont découlent plusieurs logiques proches de la logique nommée IS4. Le postulat de base utilisé (on étudie un système en l'observant) est très général. Or, notre étude montre que cela impose une logique relativement faible, puisque ni le tiers-exclus, ni l'axiome modal 5 ne sont vérifiés, et ne peuvent l'être même en ajoutant des hypothèses. Cela signifie que seuls les éléments que l'on manipule, soit les résultats d'observations, sont importants. On est donc obligé de raisonner de façon constructive à partir de ceux-ci et la non-observation d'un fait de permet pas d'en déduire sa négation. Ainsi, les seuls éléments dont il faut tenir compte dans l'observation et l'étude de la nature sont les observations que l'on en fait et toute connaissance s'obtient de façon strictement déductive à partir de celles-ci.

[cavallaro2014a] Andrea Cavallaro, Federico Di Gennaro, Jérôme Euzenat, Jan Peters-Anders, Anna Osello,
Vision of energy systems for smart cities,
Deliverable 5.2, Ready4SmartCities, 35p., November 2014
https://exmo.inria.fr/files/reports/r4sc-52.pdf

[charre2002a] Bruno Charre,
Web sémantique et recherche d'informations personnelles,
DESS d'intelligence artificielle, Université Pierre et Marie Curie, Paris (FR), septembre 2002
https://exmo.inria.fr/files/reports/dessia-charre.pdf

[cerbah2000a] Farid Cerbah, Jérôme Euzenat,
Using terminology extraction techniques for improving traceability from formal models to textual requirements,
Proc. 5th international conference on applications of natural language to information systems (NLDB), Versailles (FR), (Mokrane Bouzeghoub, Zoubida Kedad, Élisabeth Métais (eds), Natural Language Processing and Information Systems, *Lecture notes in computer science* 1959, 2001), pp115-126, 2000
https://exmo.inria.fr/files/publications/cerbah2000a.pdf
https://exmo.inria.fr/files/publications/cerbah2000a.ps.gz

This article deals with traceability in sotfware engineering. More precisely, we concentrate on the role of terminological knowledge the mapping between (informal) textual requirements and (formal) object models. We show that terminological knowledge facilitates production of traceability links, provided that language processing technologies allow to elaborate semi-automatically the required terminological resources. The presented system is one step towards incremental formalization from textual knowledge.

[cerbah2000b] Farid Cerbah, Jérôme Euzenat,
Integrating textual knowledge and formal knowledge for improving traceability,
Proc. ECAI workshop on Knowledge Management and Organizational Memory, Berlin (DE), pp10-16, 2000
http://www-sop.inria.fr/acacia/WORKSHOPS/ECAI2000-OM/Papers/ecai2000-cerbah.ps
https://exmo.inria.fr/files/publications/cerbah2000b.pdf
https://exmo.inria.fr/files/publications/cerbah2000b.ps.gz

This article deals with traceability in knowledge repositories. More precisely, we concentrate on the role of terminological knowledge in the mapping between (informal) textual requirements and (formal) object models. We show that terminological knowledge facilitates the production of traceability links, provided that language processing technologies allow to elaborate semi-automatically the required terminological resources. The presented system is one step towards incremental formalization from textual knowledge. As such, it is a valuable tool for building knowledge repositories.

[cerbah2000c] Farid Cerbah, Jérôme Euzenat,
Integrating textual knowledge and formal knowledge for improving traceability,
Proc. 12th international conference on knowledge engineering and knowledge management (EKAW), Juan-les-Pins (FR), (Rose Dieng, Olivier Corby (eds), Knowledge engineering and knowledge management: methods, models and tools, *Lecture notes in computer science* 1937, 2000), pp296-303, 2000
https://exmo.inria.fr/files/publications/cerbah2000c.pdf
https://exmo.inria.fr/files/publications/cerbah2000c.ps.gz

Knowledge engineering often concerns the translation of informal knowledge into a formal representation. This translation process requires support for itself and for its We pretend that inserting a terminological structure between informal textual documents and their formalization serves both of these goals. Modern terminology extraction tools support the process where the terms are a first sketch of formalized concepts. Moreover, the terms can be used for linking the concepts and the pieces of texts. This is exemplified through the presentation of an implemented system.

[cerbah2001a] Farid Cerbah, Jérôme Euzenat,
Traceability between models and texts through terminology,
Data and knowledge engineering 38(1):31-43, 2001
https://exmo.inria.fr/files/publications/cerbah2001a.pdf

Modeling often concerns the translation of informal texts into representations. This translation process requires support for itself and for its traceability. We pretend that inserting a terminology between informal textual documents and their formalization can help to serve both of these goals. Modern terminology extraction tools support the formalization process by using terms as a first sketch of formalized concepts. Moreover, the terms can be employed for linking the concepts and the textual sources. They act as a powerful navigation structure. This is exemplified through the presentation of a fully implemented system.

[cheatham2016a] Michelle Cheatham, Zlatan Dragisic, Jérôme Euzenat, Daniel Faria, Alfio Ferrara, Giorgos Flouris, Irini Fundulaki, Roger Granada, Valentina Ivanova, Ernesto Jiménez-Ruiz, Patrick Lambrix, Stefano Montanelli, Catia Pesquita, Tzanina Saveta, Pavel Shvaiko, Alessandro Solimando, Cássia Trojahn dos Santos, Ond#ej Zamazal,

Results of the Ontology Alignment Evaluation Initiative 2015,

Pavel Shvaiko, Jérôme Euzenat, Ernesto Jiménez-Ruiz, Michelle Cheatham, Oktie Hassanzadeh (eds), Proc. 10th ISWC workshop on ontology matching (OM), Bethlehem (PA US), pp60-115, 2016

http://ceur-ws.org/Vol-1545/oaei15_paper0.pdf
http://oaei.ontologymatching.org/2015/results/oaei2015.pdf
https://exmo.inria.fr/files/publications/cheatham2016a.pdf

Ontology matching consists of finding correspondences between semantically related entities of two ontologies. OAEI campaigns aim at comparing ontology matching systems on precisely defined test cases. These test cases can use ontologies of different nature (from simple thesauri to expressive OWL ontologies) and use different modalities, e.g., blind evaluation, open evaluation and consensus. OAEI 2015 offered 8 tracks with 15 test cases followed by 22 participants. Since 2011, the campaign has been using a new evaluation modality which provides more automation to the evaluation. This paper is an overall presentation of the OAEI 2015 campaign.

[cruz2001a] Isabel Cruz, Stefan Decker, Jérôme Euzenat, Deborah McGuinness (eds),

Semantic web working symposium (Proc. conference on Semantic Web Working Symposium (SWWS)),

597p., 2001

http://www.semanticweb.org/SWWS/program/full/SWWSProceedings.pdf
https://exmo.inria.fr/files/reports/SWWSProceedings.pdf

[cudremauroux2012a] Philippe Cudré-Mauroux, Jeff Heflin, Evren Sirin, Tania Tudorache, Jérôme Euzenat, Manfred Hauswirth, Josiane Xavier Parreira, James Hendler, Guus Schreiber, Abraham Bernstein, Eva Blomqvist (eds),

The semantic web (Proc. 11th conference on International semantic web conference (ISWC)),

Lecture notes in computer science 7649, 2012

http://www.springer.com/computer/ai/book/978-3-642-35175-4

[cudremauroux2012b] Philippe Cudré-Mauroux, Jeff Heflin, Evren Sirin, Tania Tudorache, Jérôme Euzenat, Manfred Hauswirth, Josiane Xavier Parreira, James Hendler, Guus Schreiber, Abraham Bernstein, Eva Blomqvist (eds),

The semantic web (Proc. 11th conference on International semantic web conference (ISWC)),

Lecture notes in computer science 7650, 2012

http://www.springer.com/computer/ai/book/978-3-642-35172-3

[dragisic2014a] Zlatan Dragisic, Kai Eckert, Jérôme Euzenat, Daniel Faria, Alfio Ferrara, Roger Granada, Valentina Ivanova, Ernesto Jiménez-Ruiz, Andreas Oskar Kempf, Patrick Lambrix, Stefano Montanelli, Heiko Paulheim, Dominique Ritze, Pavel Shvaiko, Alessandro Solimando, Cássia Trojahn dos Santos, Ond#ej Zamazal, Bernardo Cuenca Grau,

Results of the Ontology Alignment Evaluation Initiative 2014,

Pavel Shvaiko, Jérôme Euzenat, Ming Mao, Ernesto Jiménez-Ruiz, Juanzi Li, Axel-Cyrille Ngonga Ngomo (eds), Proc. 9th ISWC workshop on ontology matching (OM), Riva del Garda (IT), pp61-104, 2014

http://ceur-ws.org/Vol-1317/oaei14_paper0.pdf
http://oaei.ontologymatching.org/2014/results/oaei2014.pdf
https://exmo.inria.fr/files/publications/dragisic2014a.pdf

Ontology matching consists of finding correspondences between semantically related entities of two ontologies. OAEI campaigns aim at comparing ontology matching systems on precisely defined test cases. These test cases can use ontologies of different nature (from simple thesauri to expressive OWL ontologies) and use different modalities, e.g., blind evaluation, open evaluation and consensus. OAEI 2014 offered 7 tracks with 9 test cases followed by 14 participants. Since 2010, the campaign has been using a new evaluation modality which provides more automation to the evaluation. This paper is an overall presentation of the OAEI 2014 campaign.

[cuencagrau2013a] Bernardo Cuenca Grau, Zlatan Dragisic, Kai Eckert, Jérôme Euzenat, Alfio Ferrara, Roger Granada, Valentina Ivanova, Ernesto Jiménez-Ruiz, Andreas Oskar Kempf, Patrick Lambrix, Andriy Nikolov, Heiko Paulheim, Dominique Ritze, François Scharffe, Pavel Shvaiko, Cássia Trojahn dos Santos, Ond#ej Zamazal,

Results of the Ontology Alignment Evaluation Initiative 2013,

Pavel Shvaiko, Jérôme Euzenat, Kavitha Srinivas, Ming Mao, Ernesto Jiménez-Ruiz (eds), Proc. 8th ISWC workshop on ontology matching (OM), Sydney (NSW AU), pp61-100, 2013

http://ceur-ws.org/Vol-1111/oaei13_paper0.pdf
http://oaei.ontologymatching.org/2013/results/oaei2013.pdf
https://exmo.inria.fr/files/publications/cuencagrau2013a.pdf

Ontology matching consists of finding correspondences between semantically related entities of two ontologies. OAEI campaigns aim at comparing ontology matching systems on precisely defined test cases. These test cases can use ontologies of different nature (from simple thesauri to expressive OWL ontologies) and use different modalities, e.g., blind evaluation, open evaluation and consensus. OAEI 2013 offered 6 tracks with 8 test cases followed by 23 participants. Since 2010, the campaign has been using a new evaluation modality which provides more automation to the evaluation. This paper is an overall presentation of the OAEI 2013 campaign.

[euzenat2002f] Jérôme Euzenat, Asunción Gómez Pérez, Nicola Guarino, Heiner Stuckenschmidt (eds),

Ontologies and semantic interoperability (Proc. ECAI workshop on Ontologies and semantic interoperability),

597p., 2002

http://ceur-ws.org/Vol-64/
https://exmo.inria.fr/files/reports/ECAI2002-OIS-ws.pdf

[deneux2002a] Dominique Deneux, Christophe Lerch, Jérôme Euzenat, Jean-Paul Barthès,

Pluralité des connaissances dans les systèmes industriels,

In: René Soënen, Jacques Perrin (éds), Coopération et connaissance dans les systèmes industriels : une approche interdisciplinaire, Hermès Science publisher, Paris (FR), 2002, pp115-129

https://exmo.inria.fr/files/publications/deneux2002a.pdf

[cruz2002a] Isabel Cruz, Stefan Decker, Jérôme Euzenat, Deborah McGuinness (eds),

The emerging semantic web,

IOS press, Amsterdam (NL), 302p., 2002

http://exmo.inria.fr/papers/emerging/
http://www.iospress.nl/book/the-emerging-semantic-web/

The World Wide Web has been the main source of an important shift in the way people get information and order services. However, the current Web is aimed at people only. The Semantic Web is a Web defined and linked in a way that it can be used by machines not just for display purposes, but also for automation, integration and reuse of data across various applications. Facilities and technologies to put machine understandable data on the Web are rapidly becoming a high priority for many communities. In order for computers to provide more help to people, the Semantic Web augments the current Web with formalized knowledge and data that can be processed by computers. It thus needs a language for expressing knowledge. This knowledge is used to describe the content of information sources, through ontologies, and the condition of operation of Web services. One of the challenges of the current Semantic Web development is the design of a framework that allows these resources to interoperate. This book presents the state of the art in the development of the principles and technologies that will allow for the Semantic Web to become a reality. It contains revised versions of a selection of papers presented at the International Semantic Web Working Symposium that address the issues of languages, ontologies, services, and interoperability.

[david2008a] Jérôme David, Jérôme Euzenat,

Comparison between ontology distances (preliminary results),

Proc. 7th conference on international semantic web conference (ISWC), Karlsruhe (DE), (Amit Sheth, Steffen Staab, Mike Dean, Massimo Paolucci, Diana Maynard, Timothy Finin, Krishnaprasad Thirunarayan (eds), The semantic web, *Lecture notes in computer science* 5318, 2008), pp245-260, 2008

https://exmo.inria.fr/files/publications/david2008a.pdf

There are many reasons for measuring a distance between ontologies. In particular, it is useful to know quickly if two ontologies are close or remote before deciding to match them. To that extent, a distance between ontologies must be

quickly computable. We present constraints applying to such measures and several possible ontology distances. Then we evaluate experimentally some of them in order to assess their accuracy and speed.

[david2010b] Jérôme David, Jérôme Euzenat, Ond#ej Sváb-Zamazal,
Ontology similarity in the alignment space,
Proc. 9th conference on international semantic web conference (ISWC), Shanghai (CN), (Peter Patel-Schneider, Yue Pan, Pascal Hitzler, Peter Mika, Lei Zhang, Jeff Pan, Ian Horrocks, Birte Glimm (eds), The semantic web, *Lecture notes in computer science* 6496, 2010), pp129-144, 2010
https://exmo.inria.fr/files/publications/david2010b.pdf

Measuring similarity between ontologies can be very useful for different purposes, e.g., finding an ontology to replace another, or finding an ontology in which queries can be translated. Classical measures compute similarities or distances in an ontology space by directly comparing the content of ontologies. We introduce a new family of ontology measures computed in an alignment space: they evaluate the similarity between two ontologies with regard to the available alignments between them. We define two sets of such measures relying on the existence of a path between ontologies or on the ontology entities that are preserved by the alignments. The former accounts for known relations between ontologies, while the latter reflects the possibility to perform actions such as instance import or query translation. All these measures have been implemented in the OntoSim library, that has been used in experiments which showed that entity preserving measures are comparable to the best ontology space measures. Moreover, they showed a robust behaviour with respect to the alteration of the alignment space.

[david2010c] Jérôme David, Jérôme Euzenat,
Linked data from your pocket: The Android RDFContentProvider,
Proc. 9th demonstration track on international semantic web conference (ISWC), Shanghai (CN), pp129-132, 2010
http://ceur-ws.org/Vol-658/paper492.pdf
https://exmo.inria.fr/files/publications/david2010c.pdf

[david2011a] Jérôme David, Jérôme Euzenat, François Scharffe, Cássia Trojahn dos Santos,
The Alignment API 4.0,
Semantic web journal 2(1):3-10, 2011
http://www.semantic-web-journal.net/content/new-submission-alignment-api-40
https://exmo.inria.fr/files/publications/david2011a.pdf

Alignments represent correspondences between entities of two ontologies. They are produced from the ontologies by ontology matchers. In order for matchers to exchange alignments and for applications to manipulate matchers and alignments, a minimal agreement is necessary. The Alignment API provides abstractions for the notions of network of ontologies, alignments and correspondences as well as building blocks for manipulating them such as matchers, evaluators, renderers and parsers. We recall the building blocks of this API and present here the version 4 of the Alignment API through some of its new features: ontology proxys, the expressive alignment language EDOAL and evaluation primitives.

[david2012a] Jérôme David, Jérôme Euzenat, Maria Ro#oiu,
Linked data from your pocket,
Christophe Guéret, Stefan Schlobach, Florent Pigout (eds), Proc. 1st ESWC workshop on downscaling the semantic web, Hersounissos (GR), pp6-13, 2012
http://ceur-ws.org/Vol-844/paper_3.pdf
https://exmo.inria.fr/files/publications/david2012a.pdf

The paper describes a lightweight general purpose RDF framework for Android. It allows to deal uniformly with RDF, whether it comes from the web or from applications inside the device. It extends the Android content provider framework and introduces a transparent URI dereferencing scheme allowing for exposing device content as linked data.

[david2012b] Jérôme David, François Scharffe,
Détection de clefs pour l'interconnexion et le nettoyage de jeux de données,
Actes 23e journées francophones sur Ingénierie des connaissances (IC), Paris (FR), pp401, 2012
https://exmo.inria.fr/files/publications/david2012b.pdf

Cet article propose une méthode d'analyse de jeux de données du Web publiés en RDF basée sur les dépendances de clefs. Ce type particulier de dépendances fonctionnelles, largement étudié dans la théorie des bases de données, permet d'évaluer si un ensemble de propriétés constitue une clef pour l'ensemble de données considéré. Si c'est le cas, il n'y aura alors pas deux instances possédant les mêmes valeurs pour ces propriétés. Après avoir donné les définitions

nécessaires, nous proposons un algorithme de détection des clefs minimales sur un jeu de données RDF. Nous utilisons ensuite cet algorithme pour détecter les clefs de plusieurs jeux de données publiées sur le Web et appliquons notre approche pour deux applications: (1) réduire le nombre de propriétés à comparer dans le but de détecter des ressources identiques entre deux jeux de données, et (2) détecter des erreursà l'intérieur d'un jeu de données.

[david2012c] Jérôme David, Jérôme Euzenat, Jason Jung,
Experimenting with ontology distances in semantic social networks: methodological remarks,
Proc. 2nd IEEE international conference on systems, man, and cybernetics (SMC), Seoul (KR), pp2909-2914, 2012
https://exmo.inria.fr/files/publications/david2012c.pdf

Semantic social networks are social networks using ontologies for characterising resources shared within the network. It has been postulated that, in such networks, it is possible to discover social affinities between network members through measuring the similarity between the ontologies or part of ontologies they use. Using similar ontologies should reflect the cognitive disposition of the subjects. The main concern of this paper is the methodological aspect of experimenting in order to validate or invalidate such an hypothesis. Indeed, given the current lack of broad semantic social networks, it is difficult to rely on available data and experiments have to be designed from scratch. For that purpose, we first consider experimental settings that could be used and raise practical and methodological issues faced with analysing their results. We then describe a full experiments carried out according to some identified modalities and report the obtained results. The results obtained seem to invalidate the proposed hypothesis. We discuss why this may be so.

[david2012d] Jérôme David, Jérôme Euzenat, Maria Ro#oiu,
Mobile API for linked data,
Deliverable 6.3, Datalift, 19p., 2012
https://exmo.inria.fr/files/reports/datalift-63.pdf

This report presents a mobile API for manipulating linked data under the Android platform.

[david2015a] Jérôme David, Jérôme Euzenat, Manuel Atencia,
Language-independent link key-based data interlinking,
Deliverable 4.1, Lindicle, 21p., March 2015
https://exmo.inria.fr/files/reports/lindicle-41.pdf

Links are important for the publication of RDF data on the web. Yet, establishing links between data sets is not an easy task. We develop an approach for that purpose which extracts weak link keys. Link keys extend the notion of a key to the case of different data sets. They are made of a set of pairs of properties belonging to two different classes. A weak link key holds between two classes if any resources having common values for all of these properties are the same resources. An algorithm is proposed to generate a small set of candidate link keys. Depending on whether some of the, valid or invalid, links are known, we define supervised and non supervised measures for selecting the appropriate link keys. The supervised measures approximate precision and recall, while the non supervised measures are the ratio of pairs of entities a link key covers (coverage), and the ratio of entities from the same data set it identifies (discrimination). We have experimented these techniques on two data sets, showing the accuracy and robustness of both approaches.

[djoufak2007a] Jean-François Djoufak-Kengue, Jérôme Euzenat, Petko Valtchev,
OLA in the OAEI 2007 evaluation contest,
Pavel Shvaiko, Jérôme Euzenat, Fausto Giunchiglia, Bin He (eds), Proc. 2nd ISWC workshop on ontology matching (OM), Busan (KR), pp188-195, 2007
http://ceur-ws.org/Vol-304/paper16.pdf
https://exmo.inria.fr/files/publications/djouffak2007a.pdf

Similarity has become a classical tool for ontology confrontation motivated by alignment, mapping or merging purposes. In the definition of an ontology-based measure one has the choice between covering a single facet (e.g., URIs, labels, instances of an entity, etc.), covering all of the facets or just a subset thereof. In our matching tool, OLA, we had opted for an integrated approach towards similarity, i.e., calculation of a unique score for all candidate pairs based on an aggregation of all facet-wise comparison results. Such a choice further requires effective means for the establishment of importance ratios for facets, or weights, as well as for extracting an alignment out of the ultimate similarity matrix. In previous editions of the competition OLA has relied on a graph representation of the ontologies to align, OL-graphs, that reflected faithfully the syntactic structure of the OWL descriptions. A pair of OL-graphs was exploited to form and solve a system of equations whose approximate solutions were taken as the similarity scores. OLA2 is a new version of OLA which comprises a less integrated yet more homogeneous graph representation that allows similarity to be expressed as graph matching and further computed through matrix multiplying. Although OLA2 lacks key optimization tools from the previous one, while a semantic grounding in the form of WORDNET engine is missing, its results in the competition, at least for the benchmark test suite, are perceivably better.

[caraciolo2008a] Caterina Caraciolo, Jérôme Euzenat, Laura Hollink, Ryutaro Ichise, Antoine Isaac, Véronique Malaisé, Christian Meilicke, Juan Pane, Pavel Shvaiko, Heiner Stuckenschmidt, Ond#ej Sváb, Vojtech Svátek,

Results of the Ontology Alignment Evaluation Initiative 2008,

Pavel Shvaiko, Jérôme Euzenat, Fausto Giunchiglia, Heiner Stuckenschmidt (eds), Proc. 3rd ISWC workshop on ontology matching (OM), Karlsruhe (DE), pp73-119, 2008

http://ceur-ws.org/Vol-431/oaei08_paper0.pdf
http://oaei.ontologymatching.org/2008/results/oaei2008.pdf
https://exmo.inria.fr/files/publications/caraciolo2008a.pdf

Ontology matching consists of finding correspondences between ontology entities. OAEI campaigns aim at comparing ontology matching systems on precisely defined test sets. Test sets can use ontologies of different nature (from expressive OWL ontologies to simple directories) and use different modalities, e.g., blind evaluation, open evaluation, consensus. OAEI-2008 builds over previous campaigns by having 4 tracks with 8 test sets followed by 13 participants. Following the trend of previous years, more participants reach the forefront. The official results of the campaign are those published on the OAEI web site.

[chaves2010a] Marcírio Chaves, Cássia Trojahn dos Santos,

Towards a multilingual ontology for ontology-driven content mining in social web sites,

Proc. ISWC workshop on Cross-cultural and cross-lingual aspects of the semantic web, Shanghai (CN), 2010

http://ceur-ws.org/Vol-687/paper1.pdf
https://exmo.inria.fr/files/publications/chaves2010a.pdf

Social Semantic Web aims at combining approaches and technologies from both Social and Semantic Web. While Social Web sites provide a rich source of unstructured information, what makes its automatic processing very limited, Semantic Web aims at giving a welldefined meaning to the Web information, facilitating its sharing and processing. Multilinguality is an emergent aspect to be considered in Social Semantic Web and its realization is highly dependent on the development of multilingual ontologies. This paper presents Hontology, a multilingual ontology for the hotel domain. Hontology has been proposed in the context of a framework for ontology-driven mining of Social Web sites content. Comments are annotated with concepts of Hontology, which are labeled in three different languages. This approach facilitates the task of comments mining, helping managers in their decision-making process.

[daquin2009a] Mathieu d'Aquin, Jérôme Euzenat, Chan Le Duc, Holger Lewen,

Sharing and reusing aligned ontologies with cupboard,

Proc. K-Cap poster session , Redondo Beach (CA US), pp179-180, 2009

https://exmo.inria.fr/files/publications/daquin2009a.pdf

This demo presents the Cupboard online system for sharing and reusing ontologies linked together with alignments, and that are attached to rich metadata and reviews.

[david2008b] Jérôme David, Jérôme Euzenat,

On fixing semantic alignment evaluation measures,

Pavel Shvaiko, Jérôme Euzenat, Fausto Giunchiglia, Heiner Stuckenschmidt (eds), Proc. 3rd ISWC workshop on ontology matching (OM), Karlsruhe (DE), pp25-36, 2008

http://ceur-ws.org/Vol-431/om2008_Tpaper3.pdf
https://exmo.inria.fr/files/publications/david2008b.pdf

The evaluation of ontology matching algorithms mainly consists of comparing a produced alignment with a reference one. Usually, this evaluation relies on the classical precision and recall measures. This evaluation model is not satisfactory since it does not take into account neither the closeness of correspondances, nor the semantics of alignments. A first solution consists of generalizing the precision and recall measures in order to solve the problem of rigidity of classical model. Another solution aims at taking advantage of the semantic of alignments in the evaluation. In this paper, we show and analyze the limits of these evaluation models. Given that measures values depend on the syntactic form of the alignment, we first propose an normalization of alignment. Then, we propose two new sets of evaluation measures. The first one is a semantic extension of relaxed precision and recall. The second one consists of bounding the alignment space to make ideal semantic precision and recall applicable.

[david2008c] Jérôme David,

AROMA results for OAEI 2008,

Pavel Shvaiko, Jérôme Euzenat, Fausto Giunchiglia, Heiner Stuckenschmidt (eds), Proc. 3rd ISWC

workshop on ontology matching (OM), Karlsruhe (DE), pp128-131, 2008
http://ceur-ws.org/Vol-431/oaei08_paper2.pdf
https://exmo.inria.fr/files/publications/david2008c.pdf

This paper presents the results obtained by AROMA for its first participation to OAEI. AROMA is an hybrid, extensional and asymmetric ontology alignment method which makes use of the association paradigm and a statistical interstingness measure, the implication intensity.

[david2009a] Jérôme David,
AROMA results for OAEI 2009,
Pavel Shvaiko, Jérôme Euzenat, Fausto Giunchiglia, Heiner Stuckenschmidt, Natalya Noy, Arnon Rosenthal (eds), Proc. 4th ISWC workshop on ontology matching (OM), Chantilly (VA US), pp147-152, 2009
http://ceur-ws.org/Vol-551/oaei09_paper3.pdf
https://exmo.inria.fr/files/reports/david2009a.pdf

This paper presents the results obtained by AROMA for its second participation to OAEI. AROMA is an hybrid, extensional and asymmetric ontology alignment method that makes use of the association paradigm and a statistical interestingness measure, the implication intensity. AROMA performs a post-processing step that includes a terminological matcher. This year we modify this matcher in order to improve the recall obtained on real-case ontology, i.e. anatomy and 3xx tests.

[djoufak2008a] Jean-François Djoufak-Kengue, Jérôme Euzenat, Petko Valtchev,
Alignement d'ontologies dirigé par la structure,
Actes 14e journées nationales sur langages et modèles à objets (LMO), Montréal (CA), pp43-57, 2008
https://exmo.inria.fr/files/publications/djoufak2008a.pdf

L'alignement d'ontologies met en évidence les relations sémantiques entre les entités de deux ontologies à confronter. L'outil de choix pour l'alignement est une mesure de similarité sur les couples d'entités. Certaines méthodes d'alignement performantes font dépendre la similarité d'un couple de celles des couples voisins. La circularité dans les définitions résultantes est traitée par le calcul itératif d'un point fixe. Nous proposons un cadre unificateur, appelé alignement dirigé par la structure, qui permet de décrire ces méthodes en dépit de divergences d'ordre technique. Celui-ci combine l'appariement de graphes et le calcul matriciel. Nous présentons son application à la ré-implémentation de l'algorithme OLA, baptisée OLA2.

[ehrig2005a] Marc Ehrig, Jérôme Euzenat,
Relaxed precision and recall for ontology matching,
Benjamin Ashpole, Jérôme Euzenat, Marc Ehrig, Heiner Stuckenschmidt (eds), Proc. K-Cap workshop on integrating ontology, Banff (CA), pp25-32, 2005
http://ceur-ws.org/Vol-156/paper5.pdf
https://exmo.inria.fr/files/publications/ehrig2005a.pdf

In order to evaluate the performance of ontology matching algorithms it is necessary to confront them with test ontologies and to compare the results. The most prominent criteria are precision and recall originating from information retrieval. However, it can happen that an alignment be very close to the expected result and another quite remote from it, and they both share the same precision and recall. This is due to the inability of precision and recall to measure the closeness of the results. To overcome this problem, we present a framework for generalizing precision and recall. This framework is instantiated by three different measures and we show in a motivating example that the proposed measures are prone to solve the problem of rigidity of classical precision and recall.

[ehrig2005b] Marc Ehrig, Jérôme Euzenat,
Generalizing precision and recall for evaluating ontology matching,
Proc. 4th ISWC poster session , Galway (IE), ppPID-54, 2005
https://exmo.inria.fr/files/publications/ehrig2005b.pdf

We observe that the precision and recall measures are not able to discriminate between very bad and slightly out of target alignments. We propose to generalise these measures by determining the distance between the obtained alignment and the expected one. This generalisation is done so that precision and recall results are at least preserved. In addition, the measures keep some tolerance to errors, i.e., accounting for some correspondences that are close to the target instead of out of target.

[euzenat2000a] Jérôme Euzenat,
XML est-il le langage de représentation de connaissance de l'an 2000?,

Actes 6e journées sur langages et modèles à objets (LMO), Mont Saint-Hilaire (CA), pp59-74, 2000
https://exmo.inria.fr/files/publications/euzenat2000a.pdf
https://exmo.inria.fr/files/publications/euzenat2000a.ps.gz

De nombreuses applications (représentation du contenu, définition de vocabulaire) utilisent XML pour transcrire la connaissance et la communiquer telle quelle ou dans des contextes plus larges. Le langage XML est considéré comme un langage universel et sa similarité avec les systèmes à objets a été remarquée. XML va-t-il donc remplacer les langages de représentation de connaissance? Un exemple concret permet de présenter quelques questions et problèmes posés par la transcription d'un formalisme de représentation de connaissance par objets en XML. Les solutions possibles de ces problèmes sont comparées. L'avantage et la lacune principale d'XML étant son absence de sémantique, une solution à ce problème est ébauchée.

[euzenat2000c] Jérôme Euzenat,
Problèmes d'intelligibilité et solutions autour de XML,
Paul Kopp (éd), Actes séminaire CNES sur Valorisation des données, Labège (FR), 2000
https://exmo.inria.fr/files/publications/euzenat2000c.pdf
https://exmo.inria.fr/files/publications/euzenat2000c.ps.gz

Les problèmes d'intelligibilité et d'interopérabilité que pose et que résout le langage XML sont examinés en explorant progressivement les travaux destinés à les résoudre: XML en tant que langage universel, permet théoriquement l'interopérabilité. Mais XML, métalangage sans sémantique, n'offre aucune possibilité d'intelligibilité pour qui (humain ou programme) ne connaît pas le contenu. XML-Schéma n'améliore que l'interopérabilité en définissant très précisément les types de données (et parfois leurs unités). RDF, langage de description de ressources, est destiné à "ajouter de la sémantique" mais n'en dispose pas lui-même. Il sera donc très difficile (lire impossible) pour un programme de l'interpréter. Plusieurs initiatives indépendantes du W3C s'attachent à produire des langages de descriptions de contenu cette fois-ci dotés d'une sémantique rigoureuse. Ce faisant, ces langages réduisent drastiquement leurs champs d'utilisation et par conséquent les possibilités d'interopérabilité des documents les utilisant. Si le temps est suffisant, on pourra présenter brièvement (a) une proposition de langage de description de la sémantique destiné à préserver l'interopérabilité en améliorant l'intelligibilité ainsi que (b) un projet, actuellement en cours, de comparaison de plusieurs formalismes de représentation de connaissance pour la représentation du contenu.

[euzenat2000d] Jérôme Euzenat,
Towards formal knowledge intelligibility at the semiotic level,
Proc. ECAI workshop on applied semiotics: control problems, Berlin (DE), pp59-61, 2000
http://www.iitp.ru/asc2000/ps/12_EUZEN.PS
https://exmo.inria.fr/files/publications/euzenat2000d.pdf
https://exmo.inria.fr/files/publications/euzenat2000d.ps.gz

Exchange of formalised knowledge through computers is developing fast. It is assumed that using knowledge will increase the efficiency of the systems by providing a better understanding of exchanged information. However, intelligibility is by no way ensured by the use of a semantically defined language. This statement of interest explains why and calls for the involvement of the semioticians for tackling this problem.

[euzenat2000e] Jérôme Euzenat,
Vers une plate-forme de diffusion de textes sur internet : étude préliminaire,
Rapport de conseil, 63p., juin 2000

[euzenat2001a] Jérôme Euzenat,
Construction collaborative de bases de connaissance et de documents pour la capitalisation,
In: Manuel Zacklad, Michel Grundstein (éds), Ingénierie et capitalisation des connaissances, Hermès Science publisher, Paris (FR), 2001, pp25-48
https://exmo.inria.fr/files/publications/euzenat2001a.pdf
https://exmo.inria.fr/files/publications/euzenat2001a.ps.gz

L'activité de "mémoire technique" est destinée à recevoir la connaissance technique utilisée par les ingénieurs de l'entreprise. Ces mémoires techniques participent de la problématique de la gestion des connaissances ("knowledge management") en ce qu'elles permettent d'accroître les capacités de capitalisation et de gestion de la connaissance et des expériences au sein des entreprises. Une telle mémoire se doit d'être vivante si elle doit être utilisée ou enrichie. Elle doit donc être cohérente et intelligible. L'approche de la mémoire technique présentée ici est nourrie de notre expérience de la construction de bases de connaissance. À cette fin, trois principes sont ici mis en avant : la mémoire technique doit être autant que possible formalisée, elle doit être liée aux sources de connaissance informelle, elle doit exprimer le consensus d'une communauté. On présente brièvement comment le prototype CO4 répond à ces exigences en permettant l'édition de connaissance formalisée sur le world-wide web, la référence des entités modélisées vers des sources informelles et la mise en oeuvre d'un protocole de collaboration destiné à encourager le consensus entre les

acteurs.

[euzenat2001b] Jérôme Euzenat,
Towards a principled approach to semantic interoperability,
Asunción Gómez Pérez, Michael Gruninger, Heiner Stuckenschmidt, Michael Uschold (eds), Proc. IJCAI workshop on ontology and information sharing, Seattle (WA US), pp19-25, 2001
http://ceur-ws.org/Vol-47/euzenat.pdf
https://exmo.inria.fr/files/publications/euzenat2001b.pdf
https://exmo.inria.fr/files/publications/euzenat2001b.ps.gz

Semantic interoperability is the faculty of interpreting knowledge imported from other languages at the semantic level, i.e. to ascribe to each imported piece of knowledge the correct interpretation or set of models. It is a very important requirement for delivering a worldwide semantic web. This paper presents preliminary investigations towards developing a unified view of the problem. It proposes a definition of semantic interoperability based on model theory and shows how it applies to already existing works in the domain. Then, new applications of this definition to family of languages, ontology patterns and explicit description of semantics are presented.

[euzenat2001c] Jérôme Euzenat,
L'annotation formelle de documents en huit (8) questions,
Jean Charlet (éd), Actes 6e journées sur ingénierie des connaissances (IC), Grenoble (FR), pp95-110, 2001
https://exmo.inria.fr/files/publications/euzenat2001c.pdf
https://exmo.inria.fr/files/publications/euzenat2001c.ps.gz

Annoter un ensemble de documents informels à l'aide de représentations formelles appelle plusieurs questions qui doivent trouver une réponse si l'on veut développer un système cohérent. Ces questions sont liées à la forme et à l'objet des représentations retenues, à la nécessité d'utiliser de la connaissance indépendante du contenu des documents (ontologies, connaissance de contexte) et au statut du système résultant (grande base de connaissance ou éléments de connaissance distribués). Ces questions sont décrites et illustrées par la tentative d'annotation de résumés d'articles en génétique moléculaire.

[euzenat2001d] Jérôme Euzenat, Laurent Tardif,
XML transformation flow processing,
Proc. 2nd conference on extreme markup languages, Montréal (CA), pp61-72, 2001
https://moex.gitlabpages.inria.fr/transmorpher/wpaper/
http://www.mulberrytech.com/Extreme/Proceedings/html/2001/Euzenat01/EML2001Euzenat01.html
https://exmo.inria.fr/files/publications/euzenat2001d.pdf

The XSLT language is both complex to use in simple cases (like tag renaming or element hiding) and restricted in complex ones (requiring the processing of multiple stylesheets with complex information flows). We propose a framework improving on XSLT. It provides simple-to-use and easy-to-analyze macros for the basic common transformation tasks. It provides a superstructure for composing multiple stylesheets, with multiple input and output documents, in ways that are not accessible within XSLT. Having the whole transformation description in an integrated format allows to control and to analyze the complete transformation.

[euzenat2001e] Jérôme Euzenat,
Preserving modularity in XML encoding of description logics,
Deborah McGuinness, Peter Patel-Schneider, Carole Goble, Ralph Möller (eds), Proc. 14th workshop on description logics (DL), Stanford (CA US), pp20-29, 2001
http://ceur-ws.org/Vol-49/Euzenat-20start.ps
https://exmo.inria.fr/files/publications/euzenat2001e.pdf
https://exmo.inria.fr/files/publications/euzenat2001e.ps.gz

Description logics have been designed and studied in a modular way. This has allowed a methodic approach to complexity evaluation. We present a way to preserve this modularity in encoding description logics in XML and show how it can be used for building modular transformations and assembling them easily.

[euzenat2001f] Jérôme Euzenat,
An infrastructure for formally ensuring interoperability in a heterogeneous semantic web,
Proc. 1st conference on semantic web working symposium (SWWS), Stanford (CA US), pp345-360, 2001
http://www.semanticweb.org/SWWS/program/full/paper16a.pdf
https://exmo.inria.fr/files/publications/euzenat2001f.pdf

Because different applications and different communities require different features, the semantic web might have to face

the heterogeneity of the languages for expressing knowledge. Yet, it will be necessary for many applications to use knowledge coming from different sources. In such a context, ensuring the correct understanding of imported knowledge on a semantic ground is very important. We present here an infrastructure based on the notions of transformations from one language to another and of properties satisfied by transformations. We show, in the particular context of semantic properties and description logics markup language, how it is possible (1) to define properties of transformations, (2) to express, in a form easily processed by machine, the proof of a property and (3) to construct by composition a proof of properties satisfied by compound transformations. All these functions are based on extensions of current web standard languages.

[euzenat2001g] Jérôme Euzenat,
Granularity in relational formalisms with application to time and space representation,
Computational intelligence 17(4):703-737, 2001
https://exmo.inria.fr/files/publications/euzenat2001g.pdf

Temporal and spatial phenomena can be seen at a more or less precise granularity, depending on the kind of perceivable details. As a consequence, the relationship between two objects may differ depending on the granularity considered. When merging representations of different granularity, this may raise problems. This paper presents general rules of granularity conversion in relation algebras. Granularity is considered independently of the specific relation algebra, by investigating operators for converting a representation from one granularity to another and presenting six constraints that they must satisfy. The constraints are shown to be independent and consistent and general results about the existence of such operators are provided. The constraints are used to generate the unique pairs of operators for converting qualitative temporal relationships (upward and downward) from one granularity to another. Then two fundamental constructors (product and weakening) are presented: they permit the generation of new qualitative systems (e.g. space algebra) from existing ones. They are shown to preserve most of the properties of granularity conversion operators.

[euzenat2001h] Jérôme Euzenat (ed),
1st international semantic web working symposium (SWWS-1),
Deliverable 7.6, Ontoweb, 30p., September 2001
https://exmo.inria.fr/files/reports/ontoweb-del7.6.pdf

[euzenat2003m] Jérôme Euzenat (ed),
1st International Semantic Web Conference (ISWC 2002),
Deliverable 7.9, Ontoweb, 19p., January 2003
https://exmo.inria.fr/files/reports/ontoweb-del7.9.pdf

[euzenat2003n] Jérôme Euzenat (ed),
2nd International Semantic Web Conference (ISWC 2003),
Deliverable 7.11, Ontoweb, 21p., December 2003
https://exmo.inria.fr/files/reports/ontoweb-del7.11.pdf

[euzenat2002a] Jérôme Euzenat (ed),
Research challenges and perspectives of the Semantic web,
EU-NSF Strategic report, ERCIM, Sophia Antipolis (FR), 82p., January 2002
http://www.ercim.org/EU-NSF/semweb.html
http://www.ercim.org/EU-NSF/Semweb.pdf
https://exmo.inria.fr/files/reports/eunsf-semweb.pdf

[euzenat2002b] Jérôme Euzenat,
Eight questions about semantic web annotations,
IEEE Intelligent systems 17(2):55-62, 2002
https://exmo.inria.fr/files/publications/euzenat2002b.pdf

Improving information retrieval is annotation¹s central goal. However, without sufficient planning, annotation - especially when running a robot and attaching automatically extracted content - risks producing incoherent information. The author recommends answering eight questions before you annotate. He provides a practical application of this approach, and discusses applying the questions to other systems.

[euzenat2002c] Jérôme Euzenat, Laurent Tardif,
XML transformation flow processing,

Markup languages: theory and practice 3(3):285-311, 2002
https://exmo.inria.fr/files/publications/euzenat2002c.pdf

The XSLT language is both complex to use in simple cases (like tag renaming or element hiding) and restricted in complex ones (requiring the processing of multiple stylesheets with complex information flows). We propose a framework improving on XSLT. It provides simple-to-use and easy-to-analyze macros for the basic common transformation tasks. It provides a superstructure for composing multiple stylesheets, with multiple input and output documents, in ways that are not accessible within XSLT. Having the whole transformation description in an integrated format allows to control and to analyze the complete transformation.

[euzenat2002d] Jérôme Euzenat,
An infrastructure for formally ensuring interoperability in a heterogeneous semantic web,
In: Isabel Cruz, Stefan Decker, Jérôme Euzenat, Deborah McGuinness (eds), The emerging semantic web, IOS press, Amsterdam (NL), 302p., 2002, pp245-260
https://exmo.inria.fr/files/publications/euzenat2002d.pdf

Because different applications and different communities require different features, the semantic web might have to face the heterogeneity of languages for expressing knowledge. Yet, it will be necessary for many applications to use knowledge coming from different sources. In such a context, ensuring the correct understanding of imported knowledge on a semantic ground is very important. We present here an infrastructure based on the notions of transformations from one language to another and of properties satisfied by transformations. We show, in the particular context of semantic properties and description logics markup language, how it is possible (1) to define transformation properties, (2) to express, in a form easily processed by machine, the proof of a property and (3) to construct by composition a proof of properties satisfied by compound transformations. All these functions are based on extensions of current web standard languages.

[euzenat2002g] Jérôme Euzenat (ed),
Semantic web special issue,
36p., October 2002
ERCIM News n°51
http://www.ercim.org/publication/Ercim_News/enw51/
https://exmo.inria.fr/files/reports/ErcimNews51.pdf

[euzenat2002i] Jérôme Euzenat,
Personal information management and the semantic web,
3p., octobre 2002
Text for the SWAD-Europe workshop on semantic web calendaring
http://www.w3.org/2001/sw/Europe/200210/calendar/SyncLink.html

[euzenat2002ln] Jérôme Euzenat,
Sémantique des représentations de connaissance,
Notes de cours, université Joseph Fourier, Grenoble (FR), 125p., décembre 1998
https://exmo.inria.fr/files/reports/src.pdf

[napoli2000a] Amedeo Napoli, Jérôme Euzenat, Roland Ducournau,
Les représentations de connaissances par objets,
Techniques et science informatique 19(1-3):387-394, 2000
https://exmo.inria.fr/files/publications/napoli2000a.pdf
https://exmo.inria.fr/files/publications/napoli2000a.ps.gz

La finalité des systèmes de représentation des connaissances par objets est de représenter des connaissances autour de la notion centrale d'objet. Cet article décrit l'origine et l'évolution de ces systèmes, ainsi que la place et l'avenir qui leurs sont réservés.

[napoli2004a] Amedeo Napoli, Bernard Carré, Roland Ducournau, Jérôme Euzenat, François Rechenmann,
Objet et représentation, un couple en devenir,
RSTI - L'objet 10(4):61-81, 2004

Cet article propose une étude et discussion sur la place des objets en représentation des connaissances. Il n'apporte pas de réponse complète et définitive à la question, mais se veut plutôt une synthèse constructive des travaux sur les représentations par objets réalisés jusqu'à présent. Cet article est également écrit à l'intention particulière de

Jean-François Perrot, en essayant de débattre avec entrain et brio de la question actuelle des représentations par objets, des recherches et des résultats établis, des directions de recherche envisageables et de ce qui pourrait ou devrait être attendu.

[euzenat2002e] Jérôme Euzenat, Heiner Stuckenschmidt,
The `family of languages' approach to semantic interoperability,
Borys Omelayenko, Michel Klein (eds), Proc. ECAI workshop on Knowledge Transformation for the Semantic Web, Lyon (FR), pp92-99, 2002
https://exmo.inria.fr/files/publications/euzenat2002e.pdf

Exchanging knowledge via the web might lead to the use of different representation languages because different applications could take advantage of this knowledge. In order to function properly, the interoperability of these languages must be established on a semantic ground (i.e., based on the models of the representations). Several solutions can be used for ensuring this interoperability. We present a new approach based on a set of knowledge representation languages partially ordered with regard to the transformability from one language to another by preserving a particular property. The advantages of the family of languages approach are the opportunity to choose the language in which a representation will be imported and the possibility to compose the transformations available between the members of the family. For the same set of languages, there can be several structures depending on the property used for structuring the family. We focus here on semantic properties of different strength that allow us to perform practicable but well founded transformations.

[euzenat2002h] Jérôme Euzenat,
Research challenges and perspectives of the semantic web,
IEEE Intelligent systems 17(5):86-88, 2002
IEEE Intelligent systems 17(5):86-88
https://exmo.inria.fr/files/reports/euzenat2002h.pdf

Accessing documents and services on today's Web requires human intelligence. The interface to these documents and services is the Web page, written in natural language, which humans must understand and act upon. The paper discusses the Semantic Web which will augment the current Web with formalized knowledge and data that computers can process. In the future, some services will mix human-readable and structured data so that both humans and computers can use them. Others will support formalized knowledge that only machines will use.

[euzenat2003a] Jérôme Euzenat, Heiner Stuckenschmidt,
The `family of languages' approach to semantic interoperability,
In: Borys Omelayenko, Michel Klein (eds), Knowledge transformation for the semantic web, IOS press, Amsterdam (NL), 2003, pp49-63
https://exmo.inria.fr/files/publications/euzenat2003a.pdf

Different knowledge representation languages can be used for different semantic web applications. Exchanging knowledge thus requires specific techniques established on a semantic ground. We present the `family of languages' approach based on a set of knowledge representation languages whose partial ordering depends on the transformability from one language to another by preserving a particular property. For the same set of languages, there can be several such structures based on the property selected for structuring the family. Properties of different strength allow performing practicable but well founded transformations. The approach offers the choice of the language in which a representation will be imported and the composition of available transformations between the members of the family.

[euzenat2003b] Jérôme Euzenat, Nabil Layaïda, Victor Dias,
A semantic framework for multimedia document adaptation,
Proc. 18th International Joint Conference on Artificial Intelligence (IJCAI), Acapulco (MX), pp31-36, 2003
http://ijcai.org/Past%20Proceedings/IJCAI-2003/PDF/005.pdf
https://exmo.inria.fr/files/publications/euzenat2003b.pdf

With the proliferation of heterogeneous devices (desktop computers, personal digital assistants, phones), multimedia documents must be played under various constraints (small screens, low bandwidth). Taking these constraints into account with current document models is impossible. Hence, generic source documents must be transformed into documents compatible with the target contexts. Currently, the design of transformations is left to programmers. We propose here a semantic framework, which accounts for multimedia document adaptation in very general terms. A model of a multimedia document is a potential execution of this document and a context defines a particular class of models. The adaptation should then retain the source document models that belong to the class defined by the context if such models exist. Otherwise, the adaptation should produce a document whose models belong to this class and are ``close'' to those of the source documents. We focus on the temporal dimension of multimedia documents and show how

adaptation can take advantage of temporal reasoning techniques. Several metrics are given for assessing the proximity of models.

[euzenat2003c] Jérôme Euzenat,
De la sémantique formelle à une approche computationelle de l'interprétation,
Actes journées AS 'Web sémantique' CNRS sur Web sémantique et sciences de l'homme et de la société, Ivry-sur-Seine (FR), 2003
http://exmo.inria.fr/cooperation/asws/wsshs.html
https://exmo.inria.fr/files/publications/euzenat2003c.pdf

[euzenat2003d] Jérôme Euzenat,
Les avancées du web sémantique (Qu'est-ce que le web sémantique?),
Archimag(165):22-26, 2003
Archimag n°165
https://exmo.inria.fr/files/publications/euzenat2003d.pdf

[euzenat2003e] Jérôme Euzenat,
A theory of computer semiotics par Peter Bøgh Andersen,
Bulletin de l'AFIA 55:55-58, 2003
https://exmo.inria.fr/files/publications/euzenat2003e.pdf

[euzenat2003f] Jérôme Euzenat, Amedeo Napoli, Jean-François Baget,
XML et les objets (Objectif XML),
RSTI - L'objet 9(3):11-37, 2003
https://exmo.inria.fr/files/publications/euzenat2003f.pdf

Le langage XML et les objets ont en commun la perspective de partage et de réutilisation de leur contenu grace à une plus grande structuration de celui-ci. On présente la galaxie XML : la base de XML (XML, espaces de noms, DTD et représentations internes), une structuration plus proche des modàles à objets (XMI, XML-Schema et Xquery) et des outils de modélisation apparentés aux représentations de connaissances (RDF, RDF-Schema, cartes topiques et OWL). Chaque langage présenté est mis en relation avec les efforts analogues au sein des objets.

[euzenat2003g] Jérôme Euzenat, Amedeo Napoli (éds),
XML et les objets. La voie vers le web sémantique?,
RSTI - L'objet (numéro spécial) 9(3):1-122, 2003

[euzenat2003h] Jérôme Euzenat, Petko Valtchev,
An integrative proximity measure for ontology alignment,
Proc. ISWC workshop on semantic information integration, Sanibel Island (FL US), pp33-38, 2003
https://exmo.inria.fr/files/publications/euzenat2003h.pdf
http://ceur-ws.org/Vol-82/SI_paper_06.pdf

Integrating heterogeneous resources of the web will require finding agreement between the underlying ontologies. A variety of methods from the literature may be used for this task, basically they perform pair-wise comparison of entities from each of the ontologies and select the most similar pairs. We introduce a similarity measure that takes advantage of most of the features of OWL-Lite ontologies and integrates many ontology comparison techniques in a common framework. Moreover, we put forth a computation technique to deal with one-to-many relations and circularities in the similarity definitions.

[euzenat2003i] Jérôme Euzenat,
Towards composing and benchmarking ontology alignments,
Proc. ISWC workshop on semantic information integration, Sanibel Island (FL US), pp165-166, 2003
https://exmo.inria.fr/files/publications/euzenat2003i.pdf

[euzenat2003j] Jérôme Euzenat, Amedeo Napoli,
Spinning the semantic web: bringing the world wide web to its full potential par Dieter Fensel, James Hendler, Henry Lieberman and Wolfgang Wahlster,
Bulletin de l'AFIA 56-57:18-21, 2003
https://exmo.inria.fr/files/publications/euzenat2003j.pdf

[euzenat2003k] Jérôme Euzenat, Amedeo Napoli,
The semantic web: year one (Spinning the semantic web: bringing the world wide web to its full potential by Dieter Fensel, James Hendler, Henry Lieberman and Wolfgang Wahlster),
IEEE Intelligent systems 18(6):76-78, 2003
https://exmo.inria.fr/files/publications/euzenat2003k.pdf

[euzenat2004a] Jérôme Euzenat, Bernard Carré (éds),
Langages et modèles à objets 2004 (actes 10e conférence),
RSTI - L'objet (numéro spécial) 10(2-3):1-275, 2004
https://exmo.inria.fr/files/reports/lmo2004.pdf

[euzenat2004b] Jérôme Euzenat,
Chouette un langage d'ontologies pour le web!,
Actes 6e journées sur ingénierie des connaissances (IC), Lyon (FR), 2004
https://exmo.inria.fr/files/publications/euzenat2004b.pdf

[euzenat2004c] Jérôme Euzenat, Petko Valtchev,
Similarity-based ontology alignment in OWL-Lite,
Ramon López de Mantaras, Lorenza Saitta (eds), Proc. 16th european conference on artificial intelligence (ECAI), Valencia (ES), pp333-337, 2004
https://exmo.inria.fr/files/publications/euzenat2004c.pdf

Interoperability of heterogeneous systems on the Web will be admittedly achieved through an agreement between the underlying ontologies. However, the richer the ontology description language, the more complex the agreement process, and hence the more sophisticated the required tools. Among current ontology alignment paradigms, similarity-based approaches are both powerful and flexible enough for aligning ontologies expressed in languages like OWL. We define a universal measure for comparing the entities of two ontologies that is based on a simple and homogeneous comparison principle: Similarity depends on the type of entity and involves all the features that make its definition (such as superclasses, properties, instances, etc.). One-to-many relationships and circularity in entity descriptions constitute the key difficulties in this context: These are dealt with through local matching of entity sets and iterative computation of recursively dependent similarities, respectively.

[euzenat2004d] Jérôme Euzenat, David Loup, Mohamed Touzani, Petko Valtchev,
Ontology alignment with OLA,
York Sure, Óscar Corcho, Jérôme Euzenat, Todd Hughes (eds), Proc. 3rd ISWC2004 workshop on Evaluation of Ontology-based tools (EON), Hiroshima (JP), pp59-68, 2004
http://ceur-ws.org/Vol-128/EON2004_EXP_Euzenat.pdf
https://exmo.inria.fr/files/publications/euzenat2004d.pdf

Using ontologies is the standard way to achieve interoperability of heterogeneous systems within the Semantic web. However, as the ontologies underlying two systems are not necessarily compatible, they may in turn need to be aligned. Similarity-based approaches to alignment seems to be both powerful and flexible enough to match the expressive power of languages like OWL. We present an alignment tool that follows the similarity-based paradigm, called OLA. OLA relies on a universal measure for comparing the entities of two ontologies that combines in a homogeneous way the entire amount of knowledge used in entity descriptions. The measure is computed by an iterative fixed-point-bound process producing subsequent approximations of the target solution. The alignments produce by OLA on the contest ontology pairs and the way they relate to the expected alignments is discussed and some preliminary conclusions about the relevance of the similarity-based approach as well as about the experimental settings of the contest are drawn.

[euzenat2004e] Jérôme Euzenat, Raphaël Troncy,
Web sémantique et pratiques documentaires,
In: Jean-Claude Le Moal, Bernard Hidoine, Lisette Calderan (éds), Publier sur internet, ABDS, Paris (FR), 2004, pp157-188
https://exmo.inria.fr/files/publications/euzenat2004e.pdf

Le web sémantique a l'ambition de construire pour les machines l'infrastructure correspondant au web actuel et d'offrir aux humains la puissance des machines pour gérer l'information disponible dans ce web. Les technologies du web sémantique ont donc beaucoup à offrir pour assister les pratiques documentaires à venir. On présentera les technologies destinées à décrire les ressources du web et leurs ontologies dans la perspective de leur utilisation à des

fins de gestion documentaires. On présentera certaines ressources déjà existantes pouvant être utilisées dans ce but ainsi qu'une application à l'indexation de données multimédia et audiovisuelles.

[euzenat2004f] Jérôme Euzenat,
An API for ontology alignment,
Proc. 3rd conference on international semantic web conference (ISWC), Hiroshima (JP), (Frank van Harmelen, Sheila McIlraith, Dimitris Plexousakis (eds), The semantic web, *Lecture notes in computer science* 3298, 2004), pp698-712, 2004
https://exmo.inria.fr/files/publications/euzenat2004f.pdf

Ontologies are seen as the solution to data heterogeneity on the web. However, the available ontologies are themselves source of heterogeneity. This can be overcome by aligning ontologies, or finding the correspondence between their components. These alignments deserve to be treated as objects: they can be referenced on the web as such, be completed by an algorithm that improves a particular alignment, be compared with other alignments and be transformed into a set of axioms or a translation program. We present here a format for expressing alignments in RDF, so that they can be published on the web. Then we propose an implementation of this format as an Alignment API, which can be seen as an extension of the OWL API and shares some design goals with it. We show how this API can be used for effectively aligning ontologies and completing partial alignments, thresholding alignments or generating axioms and transformations.

[euzenat2004g] Jérôme Euzenat, Thanh Le Bach, Jesús Barrasa, Paolo Bouquet, Jan De Bo, Rose Dieng-Kuntz, Marc Ehrig, Manfred Hauswirth, Mustafa Jarrar, Rubén Lara, Diana Maynard, Amedeo Napoli, Giorgos Stamou, Heiner Stuckenschmidt, Pavel Shvaiko, Sergio Tessaris, Sven Van Acker, Ilya Zaihrayeu,
State of the art on ontology alignment,
Deliverable 2.2.3, Knowledge web, 80p., June 2004
http://knowledgeweb.semanticweb.org/semanticportal/servlet/download?ontology=Documentation+
https://exmo.inria.fr/files/reports/kweb-223.pdf

[euzenat2004l] Jérôme Euzenat, Marc Ehrig, Raúl García Castro,
Specification of a benchmarking methodology for alignment techniques,
Deliverable 2.2.2, Knowledge web, 48p., December 2004
http://knowledgeweb.semanticweb.org/semanticportal/home.jsp?_origin=%2Fhome.jsp&instance=D2
https://exmo.inria.fr/files/reports/kweb-222.pdf

This document considers potential strategies for evaluating ontology alignment algorithms. It identifies various goals for such an evaluation. In the context of the Knowledge web network of excellence, the most important objective is the improvement of existing methods. We examine general evaluation strategies as well as efforts that have already been undergone in the specific field of ontology alignment. We then put forward some methodological and practical guidelines for running such an evaluation.

[euzenat2004h] Jérôme Euzenat,
Introduction to the EON Ontology alignment contest,
York Sure, Óscar Corcho, Jérôme Euzenat, Todd Hughes (eds), Proc. 3rd ISWC2004 workshop on Evaluation of Ontology-based tools (EON), Hiroshima (JP), pp47-50, 2004
http://ceur-ws.org/Vol-128/EON2004_EXP_Introduction.pdf
https://exmo.inria.fr/files/publications/euzenat2004h.pdf

[euzenat2004i] Jérôme Euzenat,
Evaluating ontology alignment methods,
Proc. Dagstuhl seminar on Semantic interoperability and integration, Wadern (DE), (Yannis Kalfoglou, Marco Schorlemmer, Amit Sheth, Steffen Staab, Michael Uschold (eds), Semantic interoperability and integration, *Dagstuhl seminar proceedings*(04391), 2005), 2005
https://drops.dagstuhl.de/opus/volltexte/2005/36/
https://exmo.inria.fr/files/publications/euzenat2004i.pdf

Many different methods have been designed for aligning ontologies. These methods use such different techniques that they can hardly be compared theoretically. Hence, it is necessary to compare them on common tests. We present two initiatives that led to the definition and the performance of the evaluation of ontology alignments during 2004. We draw lessons from these two experiments and discuss future improvements.

[euzenat2004j] Jérôme Euzenat, Dieter Fensel, Asunción Gómez Pérez, Rubén Lara,
Knowledge web: realising the semantic web... all the way to knowledge-enhanced multimedia documents,
Paola Hobson, Ebroul Izquierdo, Yiannis Kompatsiaris, Noel O'Connor (eds), Proc. European workshop on Integration of knowledge, semantic and digital media technologies, London (UK), pp343-350, 2004
https://exmo.inria.fr/files/publications/euzenat2004j.pdf

The semantic web and semantic web services are major efforts in order to spread and to integrate knowledge technology to the whole web. The Knowledge Web network of excellence aims at supporting their developments at the best and largest European level and supporting industry in adopting them. It especially investigates the solution of scalability, heterogeneity and dynamics obstacles to the full development of the semantic web. We explain how Knowledge Web results should benefit knowledge-enhanced multimedia applications.

[euzenat2004k] Jérôme Euzenat, Carole Goble, Asunción Gómez Pérez, Manolis Koubarakis, David De Roure, Mike Wooldridge (eds),
Semantic intelligent middleware for the web and the grid (Proc. ECAI workshop on Semantic intelligent middleware for the web and the grid (SIM)),
2004
http://ceur-ws.org/Vol-111/

[euzenat2005a] Jérôme Euzenat, Angelo Montanari,
Time granularity,
In: Michael Fisher, Dov Gabbay, Lluis Vila (eds), Handbook of temporal reasoning in artificial intelligence, Elsevier, Amsterdam (NL), 2005, pp59-118
https://exmo.inria.fr/files/publications/euzenat2005a.pdf
http://cgi.csc.liv.ac.uk/~michael/handbook.html
http://www.elsevier.com/books/handbook-of-temporal-reasoning-in-artificial-intelligence/fis

A temporal situation can be described at different levels of abstraction depending on the accuracy required or the available knowledge. Time granularity can be defined as the resolution power of the temporal qualification of a statement. Providing a formalism with the concept of time granularity makes it possible to model time information with respect to differently grained temporal domains. This does not merely mean that one can use different time units - e.g., months and days - to represent time quantities in a unique flat temporal model, but it involves more difficult semantic issues related to the problem of assigning a proper meaning to the association of statements with the different temporal domains of a layered temporal model and of switching from one domain to a coarser/finer one. Such an ability of providing and relating temporal representations at different "grain levels" of the same reality is both an interesting research theme and a major requirement for many applications (e.g. agent communication or integration of layered specifications). After a presentation of the general properties required by a multi-granular temporal formalism, we discuss the various issues and approaches to time granularity proposed in the literature. We focus on the main existing formalisms for representing and reasoning about quantitative and qualitative time granularity: the general set-theoretic framework for time granularity developed by Bettini et al and Montanari's metric and layered temporal logic for quantitative time granularity, and Euzenat's relational algebra granularity conversion operators for qualitative time granularity. The relationships between these systems and others are then explored. At the end, we briefly describe some applications exploiting time granularity, and we discuss related work on time granularity in the areas of formal specifications of real-time systems, temporal databases, and data mining.

[euzenat2005b] Jérôme Euzenat,
Pas d'objets à sens unique!,
1p., mars 2005
Tract distributed at the 11th LMO conference, Bern (CH)
http://exmo.inria.fr/papers/TractLMO2005/euzenat2005b.html
https://exmo.inria.fr/files/publications/euzenat2005b.pdf

[euzenat2005c] Jérôme Euzenat,
L'annotation formelle de documents en (8) questions,
In: Régine Teulier, Jean Charlet, Pierre Tchounikine (éds), Ingénierie des connaissances, L'Harmattan, Paris (FR), 2005, pp251-271
https://exmo.inria.fr/files/publications/euzenat2005c.pdf

Annoter un ensemble de documents informels à l'aide de représentations formelles appelle plusieurs questions qui

doivent trouver une réponse si l'on veut développer un système cohérent. Ces questions sont liées à la forme et à l'objet des représentations retenues, à la nécessité d'utiliser de la connaissance indépendante du contenu des documents (ontologies, connaissance de contexte) et au statut du système résultant (grande base de connaissance ou éléments de connaissance distribués). Ces questions sont décrites et illustrées par l'annotation de résumés d'articles en génétique moléculaire.

[euzenat2005d] Jérôme Euzenat, Heiner Stuckenschmidt, Mikalai Yatskevich,
Introduction to the Ontology Alignment Evaluation 2005,
Benjamin Ashpole, Jérôme Euzenat, Marc Ehrig, Heiner Stuckenschmidt (eds), Proc. K-Cap workshop on integrating ontology, Banff (ALB CA), pp61-71, 2005
http://oaei.ontologymatching.org/2005/results/oaei2005.pdf
http://ceur-ws.org/Vol-156/paper10.pdf
https://exmo.inria.fr/files/publications/euzenat2005d.pdf

[euzenat2005e] Jérôme Euzenat, Philippe Guégan, Petko Valtchev,
OLA in the OAEI 2005 alignment contest,
Benjamin Ashpole, Jérôme Euzenat, Marc Ehrig, Heiner Stuckenschmidt (eds), Proc. K-Cap workshop on integrating ontology, Banff (CA), pp97-102, 2005
http://ceur-ws.org/Vol-156/paper15.pdf
https://exmo.inria.fr/files/publications/euzenat2005e.pdf

Among the variety of alignment approaches (e.g., using machine learning, subsumption computation, formal concept analysis, etc.) similarity-based ones rely on a quantitative assessment of pair-wise likeness between entities. Our own alignment tool, OLA, features a similarity model rooted in principles such as: completeness on the ontology language features, weighting of different feature contributions and mutual influence between related ontology entities. The resulting similarities are recursively defined hence their values are calculated by a step-wise, fixed-point-bound approximation process. For the OAEI 2005 contest, OLA was provided with an additional mechanism for weight determination that increases the autonomy of the system.

[euzenat2005f] Jérôme Euzenat,
Alignment infrastructure for ontology mediation and other applications,
Martin Hepp, Axel Polleres, Frank van Harmelen, Michael Genesereth (eds), Proc. 1st ICSOC international workshop on Mediation in semantic web services, Amsterdam (NL), pp81-95, 2005
http://ceur-ws.org/Vol-168/MEDIATE2005-paper6.pdf
https://exmo.inria.fr/files/publications/euzenat2005f.pdf

[euzenat2005g] Jérôme Euzenat, Loredana Laera, Valentina Tamma, Alexandre Viollet,
Negociation/argumentation techniques among agents complying to different ontologies,
Deliverable 2.3.7, Knowledge web, 43p., December 2005
https://exmo.inria.fr/files/reports/kweb-237.pdf

This document presents solutions for agents using different ontologies, to negotiate the meaning of terms used. The described solutions are based on standard agent technologies as well as alignment techniques developed within Knowledge web. They can be applied for other interacting entities such as semantic web services.

[euzenat2005h] Jérôme Euzenat, François Scharffe, Luciano Serafini,
Specification of the delivery alignment format,
Deliverable 2.2.6, Knowledge web, 46p., December 2005
https://exmo.inria.fr/files/reports/kweb-226.pdf

This deliverable focusses on the definition of a delivery alignment format for tools producing alignments (mapping tools). It considers the many formats that are currently available for expressing alignments and evaluate them with regard to criteria that such formats would satisfy. It then proposes some improvements in order to produce a format satisfying more needs.

[euzenat2006a] Jérôme Euzenat, Jérôme Pierson, Fano Ramparany,
Gestion dynamique de contexte pour l'informatique pervasive,
Actes 15e conférence AFIA-AFRIF sur reconnaissance des formes et intelligence artificielle (RFIA), Tours (FR), pp113, 2006
https://exmo.inria.fr/files/publications/euzenat2006a.pdf

L'informatique pervasive a pour but d'offrir des services fondés sur la possibilité pour les humains d'interagir avec leur

environnement (y compris les objets et autres humains qui l'occupent). Les applications dans ce domaine doivent être capable de considérer le contexte dans lequel les utilisateurs évoluent (qu'il s'agisse de leur localisation physique, leur position sociale ou hiérarchique ou leurs tâches courantes ainsi que des informations qui y sont liées). Ces applications doivent gérer dynamiquement l'irruption dans la scène de nouveaux éléments (utilisateurs ou appareils) même inconnus et produire de l'information de contexte utile à des applications non envisagées. Après avoir examiné les différents modèles de contexte étudiés en intelligence artificielle et en informatique pervasive, nous montrons en quoi ils ne répondent pas directement à ces besoins dynamiques. Nous décrivons une architecture dans laquelle les informations de contexte sont distribuées dans l'environnement et où les gestionnaires de contexte utilisent les technologies développées pour le web sémantique afin d'identifier et de caractériser les ressources disponibles. L'information de contexte est exprimée en RDF et décrite par des ontologies en OWL. Les dispositifs de l'environnement maintiennent leur propre contexte et peuvent communiquer cette information à d'autres dispositifs. Ils obéissent à un protocole simple permettant de les identifier et de déterminer quelles informations ils sont susceptibles d'apporter. Nous montrons en quoi une telle architecture permet d'ajouter de nouveaux dispositifs et de nouvelles applications sans interrompre ce qui fonctionne. En particulier, l'ouverture des langages de description d'ontologies permettent d'étendre les descriptions et l'alignement des ontologies permet de considérer des ontologies indépendantes.

[euzenat2006b] Jérôme Euzenat, Jérôme Pierson, Fano Ramparany,
A context information manager for pervasive environments,
Proc. 2nd ECAI workshop on contexts and ontologies (C&O), Riva del Garda (IT), pp25-29, 2006
https://exmo.inria.fr/files/publications/euzenat2006b.pdf

In a pervasive computing environment, heterogeneous devices need to communicate in order to provide services adapted to the situation of users. So, they need to assess this situation as their context. We have developed an extensible context model using semantic web technologies and a context information management component that enable the interaction between context information producer devices and context information consumer devices and as well as their insertion in an open environment.

[euzenat2006c] Jérôme Euzenat, Jérôme Pierson, Fano Ramparany,
A context information manager for dynamic environments,
Proc. 4th international conference on pervasive computing poster session , Dublin (EI), (Tom Pfeifer, Albrecht Schmidt, Woontack Woo, Gavin Doherty, Frédéric Vernier, Kieran Delaney, Bill Yerazunis, Matthew Chalmers, Joe Kiniry (eds), Advances in pervasive computing, Technical report 207, Österreichische computer geselschaft, Wien (OS), 2006), pp79-83, 2006
https://exmo.inria.fr/files/publications/euzenat2006c.pdf

In a pervasive environment, heterogeneous devices need to communicate in order to provide services adapted to users. We have developed an extensible context model using semantic web technologies and a context information management component that enable the interaction between context information producer devices and context information consumer devices and as well as their insertion in an open environment.

[euzenat2006d] Jérôme Euzenat, John Domingue (eds),
Artificial intelligence: methodology, systems and applications (Proc. 12th conference on Artificial intelligence: methodology, systems and applications (AIMSA)),
Lecture notes in computer science 4183, 2006
http://www.springeronline.com/3-540-40930-0
http://www.springerlink.com/content/978-3-540-40930-4/

[euzenat2006e] Jérôme Euzenat, Malgorzata Mochol, Pavel Shvaiko, Heiner Stuckenschmidt, Ond#ej Sváb, Vojtech Svátek, Willem Robert van Hage, Mikalai Yatskevich,
Results of the Ontology Alignment Evaluation Initiative 2006,
Pavel Shvaiko, Jérôme Euzenat, Natalya Noy, Heiner Stuckenschmidt, Richard Benjamins, Michael Uschold (eds), Proc. 1st ISWC 2006 international workshop on ontology matching (OM), Athens (GA US), pp73-95, (5 November) 2006
http://ceur-ws.org/Vol-225/paper7.pdf
http://oaei.ontologymatching.org/2006/results/oaei2006.pdf
https://exmo.inria.fr/files/publications/euzenat2006e.pdf

We present the Ontology Alignment Evaluation Initiative 2006 campaign as well as its results. The OAEI campaign aims at comparing ontology matching systems on precisely defined test sets. OAEI-2006 built over previous campaigns by having 6 tracks followed by 10 participants. It shows clear improvements over previous results. The final and official results of the campaign are those published on the OAEI web site.

[euzenat2006f] Jérôme Euzenat, Marc Ehrig, Anja Jentzsch, Malgorzata Mochol, Pavel Shvaiko,
Case-based recommendation of matching tools and techniques,
Deliverable 1.2.2.2.1, Knowledge web, 78p., December 2006
https://exmo.inria.fr/files/reports/kweb-126.pdf

Choosing a matching tool adapted to a particular application can be very difficult. This document analyses the choice criteria from the application viewpoint and their fulfilment by the candidate matching systems. Different methods (paper analysis, questionnaire, empirical evaluation and decision making techniques) are used for assessing them. We evaluate how these criteria can be combined and how they can help particular users to decide in favour or against some matching system.

[euzenat2007a] Jérôme Euzenat,
Semantic precision and recall for ontology alignment evaluation,
Proc. 20th International Joint Conference on Artificial Intelligence (IJCAI), Hyderabad (IN), pp348-353, 2007
http://ijcai.org/Past%20Proceedings/IJCAI-2007/PDF/IJCAI07-054.pdf
https://exmo.inria.fr/files/publications/euzenat2007a.pdf

In order to evaluate ontology matching algorithms it is necessary to confront them with test ontologies and to compare the results with some reference. The most prominent comparison criteria are precision and recall originating from information retrieval. Precision and recall are thought of as some degree of correction and completeness of results. However, when the objects to compare are semantically defined, like ontologies and alignments, it can happen that a fully correct alignment has low precision. This is due to the restricted set-theoretic foundation of these measures. Drawing on previous syntactic generalizations of precision and recall, semantically justified measures that satisfy maximal precision and maximal recall for correct and complete alignments is proposed. These new measures are compatible with classical precision and recall and can be computed.

[euzenat2007b] Jérôme Euzenat, Pavel Shvaiko,
Ontology matching,
Springer-Verlag, Heidelberg (DE), 333p., 2007
http://book.ontologymatching.org/1sted/

[euzenat2007c] Jérôme Euzenat, Jean-Marc Petit, Marie-Christine Rousset (éds),
(Actes atelier EGC 2007 sur Passage à l'échelle des techniques de découverte de correspondances (DECOR)),
83p., 2007
https://exmo.inria.fr/files/reports/EGC2007-decor-ws.pdf

[euzenat2007d] Jérôme Euzenat, Antoine Zimmermann, Marta Sabou, Mathieu d'Aquin,
Matching ontologies for context,
Deliverable 3.3.1, NeOn, 42p., 2007
https://exmo.inria.fr/files/reports/neon-331.pdf

[euzenat2007e] Jérôme Euzenat, François Scharffe, Antoine Zimmermann,
Expressive alignment language and implementation,
Deliverable 2.2.10, Knowledge web, 60p., 2007
https://exmo.inria.fr/files/reports/kweb-2210.pdf

This deliverable provides the description of an alignment language which is both expressive and independent from ontology languages. It defines the language through its abstract syntax and semantics depending on ontology language semantics. It then describes two concrete syntax: an exchange syntax in RDF/XML and a surface syntax for human consumption. Finally, it presents the current implementation of this expressive language within the Alignment API taking advantage of the OMWG implementation.

[euzenat2007f] Jérôme Euzenat, Antoine Zimmermann, Frederico Freitas,
Alignment-based modules for encapsulating ontologies,
Bernardo Cuenca Grau, Vasant Honavar, Anne Schlicht, Frank Wolter (eds), Proc. 2nd workshop on Modular ontologies (WoMO), Whistler (BC CA), pp32-45, 2007
https://exmo.inria.fr/files/publications/euzenat2007f.pdf

Ontology engineering on the web requires a well-defined ontology module system that allows sharing knowledge. This involves declaring modules that expose their content through an interface which hides the way concepts are modeled. We provide a straightforward syntax for such modules which is mainly based on ontology alignments. We show how to adapt a generic semantics of alignments so that it accounts for the hiding of non-exported elements, but honor the semantics of the encapsulated ontologies. The generality of this framework allows modules to be reused within different contexts built upon various logical formalisms.

[euzenat2007g] Jérôme Euzenat, Antoine Isaac, Christian Meilicke, Pavel Shvaiko, Heiner Stuckenschmidt, Ond#ej Sváb, Vojtech Svátek, Willem Robert van Hage, Mikalai Yatskevich,
Results of the Ontology Alignment Evaluation Initiative 2007,
Pavel Shvaiko, Jérôme Euzenat, Fausto Giunchiglia, Bin He (eds), Proc. 2nd ISWC 2007 international workshop on ontology matching (OM), Busan (KR), pp96-132, (11 November) 2007
http://ceur-ws.org/Vol-304/paper9.pdf
https://exmo.inria.fr/files/publications/euzenat2007g.pdf
http://oaei.ontologymatching.org/2007/results/oaei2007.pdf

We present the Ontology Alignment Evaluation Initiative 2007 campaign as well as its results. The OAEI campaign aims at comparing ontology matching systems on precisely defined test sets. OAEI-2007 builds over previous campaigns by having 4 tracks with 7 test sets followed by 17 participants. This is a major increase in the number of participants compared to the previous years. Also, the evaluation results demonstrate that more participants are at the forefront. The final and official results of the campaign are those published on the OAEI web site.

[euzenat2007h] Jérôme Euzenat,
Semantic web semantics,
Lecture notes, université Joseph Fourier, Grenoble (FR), 190p., 2007
http://exmo.inria.fr/teaching/swxo/poly/semwebsem.pdf

[euzenat2008a] Jérôme Euzenat, Adrian Mocan, François Scharffe,
Ontology alignments: an ontology management perspective,
In: Martin Hepp, Pieter De Leenheer, Aldo De Moor, York Sure (eds), Ontology management: semantic web, semantic web services, and business applications, Springer, New-York (NY US), 2008, pp177-206
https://exmo.inria.fr/files/publications/euzenat2008a.pdf

Relating ontologies is very important for many ontology-based applications and more important in open environments like the semantic web. The relations between ontology entities can be obtained by ontology matching and represented as alignments. Hence, alignments must be taken into account in ontology management. This chapter establishes the requirements for alignment management. After a brief introduction to matching and alignments, we justify the consideration of alignments as independent entities and provide the life cycle of alignments. We describe the important functions of editing, managing and exploiting alignments and illustrate them with existing components.

[euzenat2008b] Jérôme Euzenat,
Quelques pistes pour une distance entre ontologies,
Marie-Aude Aufaure, Omar Boussaid, Pascale Kuntz (éds), Actes 1er atelier EGC 2008 sur similarité sémantique, Sophia-Antipolis (FR), pp51-66, 2008
https://exmo.inria.fr/files/publications/euzenat2008b.pdf

Il y a plusieurs raisons pour lesquelles il est utile de mesurer une distance entre ontologies. En particulier, il est important de savoir rapidement si deux ontologies sont proches où éloignées afin de déterminer s'il est utile de les aligner ou non. Dans cette perspective, une distance entre ontologies doit pouvoir se calculer rapidement. Nous présentons les contraintes qui pèsent sur de telles mesures et nous explorons diverses manières d'établir de telles distances. Des mesures peuvent être fondées sur les ontologies elles-même, en particulier sur leurs caractéristiques terminologiques, structurelles, extensionnelles ou sémantiques; elles peuvent aussi être fondées sur des alignements préalables, en particulier sur l'existence ou la qualité de tels alignments. Comme on peut s'y attendre, il n'existe pas de distance possédant toutes les qualités désirées, mais une batterie de techniques qui méritent d'être expérimentées.

[euzenat2008c] Jérôme Euzenat, Jérôme Pierson, Fano Ramparany,
Dynamic context management for pervasive applications,
Knowledge engineering review 23(1):21-49, 2008
https://www.cambridge.org/core/services/aop-cambridge-core/content/view/041406608195FD860F6
https://exmo.inria.fr/files/publications/euzenat2008c.pdf

Pervasive computing aims at providing services for human beings that interact with their environment, encompassing

objects and humans who reside in it. Applications must be able to take into account the context in which users evolve, e.g., physical location, social or hierarchical position, current tasks as well as related information. These applications have to deal with the dynamic integration in the environment of new, and sometimes unexpected, elements (users or devices). In turn, the environment has to provide context information to newly designed applications. We describe an architecture in which context information is distributed in the environment and context managers use semantic web technologies in order to identify and characterize available resources. The components in the environment maintain their own context expressed in RDF and described through OWL ontologies. They may communicate this information to other components, obeying a simple protocol for identifying them and determining the information they are capable to provide. We show how this architecture allows the introduction of new components and new applications without interrupting what is working. In particular, the openness of ontology description languages makes possible the extension of context descriptions and ontology matching helps dealing with independently developed ontologies.

[euzenat2008d] Jérôme Euzenat, François Scharffe, Axel Polleres,
Processing ontology alignments with SPARQL (Position paper),
Proc. IEEE international workshop on Ontology alignment and visualization (OAaV), Barcelona (ES), pp913-917, 2008
https://exmo.inria.fr/files/publications/euzenat2008d.pdf

Solving problems raised by heterogeneous ontologies can be achieved by matching the ontologies and processing the resulting alignments. This is typical of data mediation in which the data must be translated from one knowledge source to another. We propose to solve the data translation problem, i.e. the processing part, using the SPARQL query language. Indeed, such a language is particularly adequate for extracting data from one ontology and, through its CONSTRUCT statement, for generating new data. We present examples of such transformations, but we also present a set of example correspondences illustrating the needs for particular representation constructs, such as aggregates, value-generating built-in functions and paths, which are missing from SPARQL. Hence, we advocate the use of two SPARQL extensions providing these missing features.

[euzenat2008e] Jérôme Euzenat,
Algebras of ontology alignment relations,
Proc. 7th conference on international semantic web conference (ISWC), Karlsruhe (DE), (Amit Sheth, Steffen Staab, Mike Dean, Massimo Paolucci, Diana Maynard, Timothy Finin, Krishnaprasad Thirunarayan (eds), The semantic web, *Lecture notes in computer science* 5318, 2008), pp387-402, 2008
https://exmo.inria.fr/files/publications/euzenat2008e.pdf

Correspondences in ontology alignments relate two ontology entities with a relation. Typical relations are equivalence or subsumption. However, different systems may need different kinds of relations. We propose to use the concepts of algebra of relations in order to express the relations between ontology entities in a general way. We show the benefits in doing so in expressing disjunctive relations, merging alignments in different ways, amalgamating alignments with relations of different granularity, and composing alignments.

[euzenat2008f] Jérôme Euzenat, Jérôme David, Chan Le Duc, Marko Grobelnik, Bostjan Pajntar, Dunja Mladenic,
Integration of OntoLight with the Alignment server,
Deliverable 3.3.3, NeOn, 25p., 2008
https://exmo.inria.fr/files/reports/neon-333.pdf

This deliverable describes the integration of the OntoLight matcher within the Alignment server and the NeOn toolkit. This integration uses a web service connection from the Alignment server to an OntoLight web service interface.

[euzenat2008g] Jérôme Euzenat, François Scharffe, Axel Polleres,
SPARQL Extensions for processing alignments,
IEEE Intelligent systems 23(6):82-84, 2008
https://exmo.inria.fr/files/publications/euzenat2008g.pdf

[euzenat2009a] Jérôme Euzenat, Onyeari Mbanefo, Arun Sharma,
Sharing resources through ontology alignment in a semantic peer-to-peer system,
In: Yannis Kalfoglou (ed), Cases on semantic interoperability for information systems integration: practice and applications, IGI Global, Hershey (PA US), 2009, pp107-126
http://www.igi-global.com/chapter/sharing-resources-through-ontology-alignments/38041
https://exmo.inria.fr/files/publications/euzenat2009a.pdf

Relating ontologies is very important for many ontology-based applications and more important in open environments

like the semantic web. The relations between ontology entities can be obtained by ontology matching and represented as alignments. Hence, alignments must be taken into account in ontology management. This chapter establishes the requirements for alignment management. After a brief introduction to matching and alignments, we justify the consideration of alignments as independent entities and provide the life cycle of alignments. We describe the important functions of editing, managing and exploiting alignments and illustrate them with existing components.

[euzenat2009b] Jérôme Euzenat, Carlo Allocca, Jérôme David, Mathieu d'Aquin, Chan Le Duc, Ond#ej Sváb-Zamazal,

Ontology distances for contextualisation,

Deliverable 3.3.4, NeOn, 50p., 2009

https://exmo.inria.fr/files/reports/neon-334.pdf

Distances between ontologies are useful for searching, matching or visualising ontologies. We study the various distances that can be defined across ontologies and provide them in a NeOn toolkit plug-in, OntoSim, which is a library of distances that can be used for recontextualising.

[euzenat2009c] Jérôme Euzenat, Alfio Ferrara, Laura Hollink, Antoine Isaac, Cliff Joslyn, Véronique Malaisé, Christian Meilicke, Andriy Nikolov, Juan Pane, Marta Sabou, François Scharffe, Pavel Shvaiko, Vassilis Spiliopoulos, Heiner Stuckenschmidt, Ond#ej Sváb-Zamazal, Vojtech Svátek, Cássia Trojahn dos Santos, George Vouros, Shenghui Wang,

Results of the Ontology Alignment Evaluation Initiative 2009,

Pavel Shvaiko, Jérôme Euzenat, Fausto Giunchiglia, Heiner Stuckenschmidt, Natalya Noy, Arnon Rosenthal (eds), Proc. 4th ISWC workshop on ontology matching (OM), Chantilly (VA US), pp73-126, 2009

http://ceur-ws.org/Vol-551/oaei09_paper0.pdf
http://oaei.ontologymatching.org/2009/results/oaei2009.pdf
https://exmo.inria.fr/files/publications/euzenat2009c.pdf

Ontology matching consists of finding correspondences between ontology entities. OAEI campaigns aim at comparing ontology matching systems on precisely defined test cases. Test cases can use ontologies of different nature (from expressive OWL ontologies to simple directories) and use different modalities, e.g., blind evaluation, open evaluation, consensus. OAEI-2009 builds over previous campaigns by having 5 tracks with 11 test cases followed by 16 participants. This paper is an overall presentation of the OAEI 2009 campaign.

[euzenat2010a] Jérôme Euzenat, Philipp Cimiano, John Domingue, Siegfried Handschuh, Hannes Werthner,

Personal infospheres,

Proc. Dagstuhl seminar on Semantic web reflections and future directions, Wadern (DE), (John Domingue, Dieter Fensel, James Hendler, Rudi Studer (eds), Semantic web reflections and future directions, *Dagstuhl seminar proceedings*(09271), 2010), pp12-17, 2010

http://drops.dagstuhl.de/opus/volltexte/2010/2533/
https://exmo.inria.fr/files/publications/euzenat2010a.pdf

[euzenat2010b] Jérôme Euzenat, Alfio Ferrara, Christian Meilicke, Andriy Nikolov, Juan Pane, François Scharffe, Pavel Shvaiko, Heiner Stuckenschmidt, Ond#ej Sváb-Zamazal, Vojtech Svátek, Cássia Trojahn dos Santos,

Results of the Ontology Alignment Evaluation Initiative 2010,

Pavel Shvaiko, Jérôme Euzenat, Fausto Giunchiglia, Heiner Stuckenschmidt, Ming Mao, Isabel Cruz (eds), Proc. 5th ISWC workshop on ontology matching (OM), Shanghai (CN), pp85-117, 2010

http://ceur-ws.org/Vol-689/oaei10_paper0.pdf
http://oaei.ontologymatching.org/2010/results/oaei2010.pdf
https://exmo.inria.fr/files/publications/euzenat2010b.pdf

Ontology matching consists of finding correspondences between entities of two ontologies. OAEI campaigns aim at comparing ontology matching systems on precisely defined test cases. Test cases can use ontologies of different nature (from simple directories to expressive OWL ontologies) and use different modalities, e.g., blind evaluation, open evaluation, consensus. OAEI-2010 builds over previous campaigns by having 4 tracks with 6 test cases followed by 15 participants. This year, the OAEI campaign introduces a new evaluation modality in association with the SEALS project. A subset of OAEI test cases is included in this new modality which provides more automation to the evaluation and more direct feedback to the participants. This paper is an overall presentation of the OAEI 2010 campaign.

[euzenat2010c] Jérôme Euzenat, Christian Meilicke, Heiner Stuckenschmidt, Cássia Trojahn dos Santos,

A web-based evaluation service for ontology matching,
Proc. 9th demonstration track on international semantic web conference (ISWC), Shanghai (CN), pp93-96, 2010
http://ceur-ws.org/Vol-658/paper468.pdf
https://exmo.inria.fr/files/publications/euzenat2010c.pdf

Evaluation of semantic web technologies at large scale, including ontology matching, is an important topic of semantic web research. This paper presents a web-based evaluation service for automatically executing the evaluation of ontology matching systems. This service is based on the use of a web service interface wrapping the functionality of a matching tool to be evaluated and allows developers to launch evaluations of their tool at any time on their own. Furthermore, the service can be used to visualise and manipulate the evaluation results. The approach allows the execution of the tool on the machine of the tool developer without the need for a runtime environment.

[euzenat2011a] Jérôme Euzenat,
L'intelligence du web: l'information utile à portée de lien,
Bulletin de l'AFIA 72:13-16, 2011
https://exmo.inria.fr/files/publications/euzenat2011a.pdf

[euzenat2011b] Jérôme Euzenat, Christian Meilicke, Pavel Shvaiko, Heiner Stuckenschmidt, Cássia Trojahn dos Santos,
Ontology Alignment Evaluation Initiative: six years of experience,
Journal on data semantics XV(6720):158-192, 2011
https://exmo.inria.fr/files/publications/euzenat2011b.pdf

In the area of semantic technologies, benchmarking and systematic evaluation is not yet as established as in other areas of computer science, e.g., information retrieval. In spite of successful attempts, more effort and experience are required in order to achieve such a level of maturity. In this paper, we report results and lessons learned from the Ontology Alignment Evaluation Initiative (OAEI), a benchmarking initiative for ontology matching. The goal of this work is twofold: on the one hand, we document the state of the art in evaluating ontology matching methods and provide potential participants of the initiative with a better understanding of the design and the underlying principles of the OAEI campaigns. On the other hand, we report experiences gained in this particular area of semantic technologies to potential developers of benchmarking for other kinds of systems. For this purpose, we describe the evaluation design used in the OAEI campaigns in terms of datasets, evaluation criteria and workflows, provide a global view on the results of the campaigns carried out from 2005 to 2010 and discuss upcoming trends, both specific to ontology matching and generally relevant for the evaluation of semantic technologies. Finally, we argue that there is a need for a further automation of benchmarking to shorten the feedback cycle for tool developers.

[euzenat2011c] Jérôme Euzenat,
Semantic technologies and ontology matching for interoperability inside and across buildings,
Proc. 2nd CIB workshop on eeBuildings data models, Sophia-Antipolis (FR), pp22-34, 2011
https://exmo.inria.fr/files/publications/euzenat2011c.pdf

There are many experiments with buildings that communicate information to and react to instructions from inhabiting systems. Fortunately, the life of people does not stop at the door of those buildings. It is thus very important that from one building to another, from a building to its outside, and from a building considered as a whole to specific rooms, continuity in the perceived information and potential actions be ensured. One way to achieve this would be by standardising representation vocabularies that any initiative should follow. But, at such an early stage, this would be an obstacle to innovation, because experimenters do not know yet what is needed in their context. We advocate that semantic technologies, in addition to be already recognised as a key component in communicating building platforms, are adequate tools for ensuring interoperability between building settings. For that purpose, we first present how these technologies (RDF, OWL, SPARQL, Alignment) can be used within ambient intelligent applications. Then, we review several solutions for ensuring interoperability between heterogeneous building settings, in particular through online embedded matching, alignment servers or collaborative matching. We describe the state of the art in ontology matching and how it can be used for providing interoperability between semantic descriptions.

[euzenat2011d] Jérôme Euzenat, Alfio Ferrara, Willem Robert van Hague, Laura Hollink, Christian Meilicke, Andriy Nikolov, François Scharffe, Pavel Shvaiko, Heiner Stuckenschmidt, Ond#ej Sváb-Zamazal, Cássia Trojahn dos Santos,
Results of the Ontology Alignment Evaluation Initiative 2011,
Pavel Shvaiko, Isabel Cruz, Jérôme Euzenat, Tom Heath, Ming Mao, Christoph Quix (eds), Proc. 6th ISWC workshop on ontology matching (OM), Bonn (DE), pp85-110, 2011

http://ceur-ws.org/Vol-814/oaei11_paper0.pdf
http://oaei.ontologymatching.org/2011/results/oaei2011.pdf
https://exmo.inria.fr/files/publications/euzenat2011d.pdf

Ontology matching consists of finding correspondences between entities of two ontologies. OAEI campaigns aim at comparing ontology matching systems on precisely defined test cases. Test cases can use ontologies of different nature (from simple directories to expressive OWL ontologies) and use different modalities, e.g., blind evaluation, open evaluation, consensus. OAEI-2011 builds over previous campaigns by having 4 tracks with 6 test cases followed by 18 participants. Since 2010, the campaign introduces a new evaluation modality in association with the SEALS project. A subset of OAEI test cases is included in this new modality which provides more automation to the evaluation and more direct feedback to the participants. This paper is an overall presentation of the OAEI 2011 campaign.

[euzenat2011e] Jérôme Euzenat, Nathalie Abadie, Bénédicte Bucher, Zhengjie Fan, Houda Khrouf, Michael Luger, François Scharffe, Raphaël Troncy,

Dataset interlinking module,

Deliverable 4.2, Datalift, 32p., 2011
https://exmo.inria.fr/files/reports/datalift-421.pdf

This report presents the first version of the interlinking module for the Datalift platform as well as strategies for future developments.

[euzenat2012a] Jérôme Euzenat, Chan Le Duc,

Methodological guidelines for matching ontologies,

In: Maria Del Carmen Suárez Figueroa, Asunción Gómez Pérez, Enrico Motta, Aldo Gangemi (eds), Ontology engineering in a networked world, Springer, Heidelberg (DE), 2012, pp257-278
http://www.springer.com/computer/ai/book/978-3-642-24793-4
https://exmo.inria.fr/files/publications/euzenat2012a.pdf

Finding alignments between ontologies is a very important operation for ontology engineering. It allows for establishing links between ontologies, either to integrate them in an application or to relate developed ontologies to context. It is even more critical for networked ontologies. Incorrect alignments may lead to unwanted consequences throughout the whole network and incomplete alignments may fail to provide the expected consequences. Yet, there is no well established methodology available for matching ontologies. We propose methodological guidelines that build on previously disconnected results and experiences.

[euzenat2012b] Jérôme Euzenat,

A modest proposal for data interlinking evaluation,

Pavel Shvaiko, Jérôme Euzenat, Anastasios Kementsietsidis, Ming Mao, Natalya Noy, Heiner Stuckenschmidt (eds), Proc. 7th ISWC workshop on ontology matching (OM), Boston (MA US), pp234-235, 2012
http://ceur-ws.org/Vol-946/om2012_poster1.pdf
https://exmo.inria.fr/files/publications/euzenat2012b.pdf

Data interlinking is a very important topic nowadays. It is sufficiently similar to ontology matching that comparable evaluation can be overtaken. However, it has enough differences, so that specific evaluations may be designed. We discuss such variations and design.

[euzenat2013a] Jérôme Euzenat, Maria Ro#oiu, Cássia Trojahn dos Santos,

Ontology matching benchmarks: generation, stability, and discriminability,

Journal of web semantics 21:30-48, 2013
https://exmo.inria.fr/files/publications/euzenat2013a.pdf

The OAEI Benchmark test set has been used for many years as a main reference to evaluate and compare ontology matching systems. However, this test set has barely varied since 2004 and has become a relatively easy task for matchers. In this paper, we present the design of a flexible test generator based on an extensible set of alterators which may be used programmatically for generating different test sets from different seed ontologies and different alteration modalities. It has been used for reproducing Benchmark both with the original seed ontology and with other ontologies. This highlights the remarkable stability of results over different generations and the preservation of difficulty across seed ontologies, as well as a systematic bias towards the initial Benchmark test set and the inability of such tests to identify an overall winning matcher. These were exactly the properties for which Benchmark had been designed. Furthermore, the generator has been used for providing new test sets aiming at increasing the difficulty and discriminability of Benchmark. Although difficulty may be easily increased with the generator, attempts to increase discriminability proved unfruitful. However, efforts towards this goal raise questions about the very nature of discriminability.

[euzenat2013b] Jérôme Euzenat,
Uncertainty in crowdsourcing ontology matching,
Pavel Shvaiko, Jérôme Euzenat, Kavitha Srinivas, Ming Mao, Ernesto Jiménez-Ruiz (eds), Proc. 8th ISWC workshop on ontology matching (OM), Sydney (NSW AU), pp221-222, 2013
http://ceur-ws.org/Vol-1111/om2013_poster2.pdf
https://exmo.inria.fr/files/publications/euzenat2013b.pdf

[euzenat2013c] Jérôme Euzenat, Pavel Shvaiko,
Ontology matching,
Springer-Verlag, Heidelberg (DE), 520p., 2013
http://book.ontologymatching.org

[euzenat2014a] Jérôme Euzenat, Marie-Christine Rousset,
Web sémantique,
In: Pierre Marquis, Odile Papini, Henri Prade (éds), L'IA: frontières et applications, Cepadues, Toulouse (FR), 2014,
Le web sémantique ambitionne de rendre le contenu du web accessible au calcul. Il ne s'agit rien moins que de représenter de la connaissance à l'échelle du web. Les principales technologies utilisées dans ce cadre sont: la représentation de connaissance assertionnelle à l'aide de graphes, la définition du vocabulaire de ces graphes à l'aide d'ontologies, la connexion des représentations à travers le web, et leur appréhension pour interpréter la connaissance ainsi exprimée et répondre à des requêtes. Les techniques d'intelligence artificielle, et principalement de représentation de connaissances, y sont donc mises à contribution et à l'épreuve. En effet, elles sont confrontées à des problèmes typiques du web tels que l'échelle, l'hétérogénéité, l'incomplétude, l'incohérence et la dynamique. Ce chapitre propose une courte présentation de l'état du domaine et renvoie aux autres chapitres concernant les technologies mises en oeuvre dans le web sémantique.

[euzenat2014b] Jérôme Euzenat,
First experiments in cultural alignment repair,
Proc. 3rd ESWC workshop on Debugging ontologies and ontology mappings (WoDOOM), Hersounisos (GR), pp3-14, 2014
http://ceur-ws.org/Vol-1162/paper1.pdf
https://exmo.inria.fr/files/publications/euzenat2014b.pdf
Alignments between ontologies may be established through agents holding such ontologies attempting at communicating and taking appropriate action when communication fails. This approach has the advantage of not assuming that everything should be set correctly before trying to communicate and of being able to overcome failures. We test here the adaptation of this approach to alignment repair, i.e., the improvement of incorrect alignments. For that purpose, we perform a series of experiments in which agents react to mistakes in alignments. The agents only know about their ontologies and alignments with others and they act in a fully decentralised way. We show that such a society of agents is able to converge towards successful communication through improving the objective correctness of alignments. The obtained results are on par with a baseline of a priori alignment repair algorithms.

[euzenat2014c] Jérôme Euzenat,
First experiments in cultural alignment repair (extended version),
In: Valentina Presutti, Eva Blomqvist, Raphaël Troncy, Harald Sack, Ioannis Papadakis, Anna Tordai (eds), ESWC 2014 satellite events revised selected papers, Springer Verlag, Heidelberg (DE), 2014, pp115-130
https://exmo.inria.fr/files/publications/euzenat2014c.pdf
Alignments between ontologies may be established through agents holding such ontologies attempting at communicating and taking appropriate action when communication fails. This approach, that we call cultural repair, has the advantage of not assuming that everything should be set correctly before trying to communicate and of being able to overcome failures. We test here the adaptation of this approach to alignment repair, i.e., the improvement of incorrect alignments. For that purpose, we perform a series of experiments in which agents react to mistakes in alignments. The agents only know about their ontologies and alignments with others and they act in a fully decentralised way. We show that cultural repair is able to converge towards successful communication through improving the objective correctness of alignments. The obtained results are on par with a baseline of a priori alignment repair algorithms.

[euzenat2014d] Jérôme Euzenat,
The category of networks of ontologies,
Research report 8652, INRIA, Grenoble (FR), 19p., December 2014
https://hal.inria.fr/hal-01093207
https://exmo.inria.fr/files/reports/rr-inria-8652.pdf
http://arxiv.org/abs/1412.3279

The semantic web has led to the deployment of ontologies on the web connected through various relations and, in particular, alignments of their vocabularies. There exists several semantics for alignments which make difficult interoperation between different interpretation of networks of ontologies. Here we present an abstraction of these semantics which allows for defining the notions of closure and consistency for networks of ontologies independently from the precise semantics. We also show that networks of ontologies with specific notions of morphisms define categories of networks of ontologies.

[euzenat2015c] Jérôme Euzenat, Jérôme David, Angela Locoro, Armen Inants,
Context-based ontology matching and data interlinking,
Deliverable 3.1, Lindicle, 21p., July 2015
https://exmo.inria.fr/files/reports/lindicle-31.pdf

Context-based matching finds correspondences between entities from two ontologies by relating them to other resources. A general view of context-based matching is designed by analysing existing such matchers. This view is instantiated in a path-driven approach that (a) anchors the ontologies to external ontologies, (b) finds sequences of entities (path) that relate entities to match within and across these resources, and (c) uses algebras of relations for combining the relations obtained along these paths. Parameters governing such a system are identified and made explicit. We discuss the extension of this approach to data interlinking and its benefit to cross-lingual data interlinking. First, this extension would require an hybrid algebra of relation that combines relations between individual and classes. However, such an algebra may not be particularly useful in practice as only in a few restricted case it could conclude that two individuals are the same. But it can be used for finding mistakes in link sets.

[euzenat2015a] Jérôme Euzenat,
Revision in networks of ontologies,
Artificial intelligence 228:195-216, 2015
https://exmo.inria.fr/files/publications/euzenat2015a.pdf

Networks of ontologies are made of a collection of logic theories, called ontologies, related by alignments. They arise naturally in distributed contexts in which theories are developed and maintained independently, such as the semantic web. In networks of ontologies, inconsistency can come from two different sources: local inconsistency in a particular ontology or alignment, and global inconsistency between them. Belief revision is well-defined for dealing with ontologies; we investigate how it can apply to networks of ontologies. We formulate revision postulates for alignments and networks of ontologies based on an abstraction of existing semantics of networks of ontologies. We show that revision operators cannot be simply based on local revision operators on both ontologies and alignments. We adapt the partial meet revision framework to networks of ontologies and show that it indeed satisfies the revision postulates. Finally, we consider strategies based on network characteristics for designing concrete revision operators.

[euzenat2016a] Jérôme Euzenat,
Extraction de clés de liage de données (résumé étendu),
Actes 16e conférence internationale francophone sur extraction et gestion des connaissances (EGC), Reims (FR), (Bruno Crémilleux, Cyril de Runz (éds), (Actes 16e conférence internationale francophone sur extraction et gestion des connaissances (EGC)), *Revue des nouvelles technologies de l'information* E30, 2016), pp9-12, 2016
https://exmo.inria.fr/files/publications/euzenat2016a.pdf

De grandes quantités de données sont publiées sur le web des données. Les lier consiste à identifier les mêmes ressources dans deux jeux de données permettant l'exploitation conjointe des données publiées. Mais l'extraction de liens n'est pas une tâche facile. Nous avons développé une approche qui extrait des clés de liage (link keys). Les clés de liage étendent la notion de clé de l'algèbre relationnelle à plusieurs sources de données. Elles sont fondées sur des ensembles de couples de propriétés identifiant les objets lorsqu'ils ont les mêmes valeurs, ou des valeurs communes, pour ces propriétés. On présentera une manière d'extraire automatiquement les clés de liage candidates à partir de données. Cette opération peut être exprimée dans l'analyse formelle de concepts. La qualité des clés candidates peut-être évaluée en fonction de la disponibilité (cas supervisé) ou non (cas non supervisé) d'un échantillon de liens. La pertinence et de la robustesse de telles clés seront illustrées sur un exemple réel.

[exmo2001a] action Exmo, société FluxMedia,
Transmorpher 1.0,
Reference manual, INRIA Rhône-Alpes/FluxMedia, Grenoble (FR), 2001
https://moex.gitlabpages.inria.fr/transmorpher/refman/

[fan2012a] Zhengjie Fan,
Data linking with ontology alignment,
Proc. 9th conference on European semantic web conference (ESWC), Heraklion (GR), (Elena Simperl, Philipp Cimiano, Axel Polleres, Óscar Corcho, Valentina Presutti (eds), The semantic web: research and applications (Proc. 9th European semantic web conference poster session), *Lecture notes in computer science* 7295, 2012), pp854-858, 2012
https://exmo.inria.fr/files/publications/fan2012a.pdf

It is a trend to publish RDF data on the web, so that users can share information semantically. Then, linking isolated data sets together is highly needed. I would like to reduce the comparison scale by isolating the types of resources to be compared, so that it enhances the accuracy of the linking process. I propose a data linking method for linked data on the web. Such a method can interlink linked data automatically by referring to an ontology alignment between linked data sets. Alignments can provide them entities to compare.

[fan2013a] Zhengjie Fan, Thin Dong Ngoc Nguyen, Jérôme Euzenat, Fayçal Hamdi, François Scharffe,
Dataset interlinking module,
Deliverable 4.2, Datalift, 34p., 2013
https://exmo.inria.fr/files/reports/datalift-422.pdf

This report presents the second version of the interlinking module for the Datalift platform as well as strategies for future developments.

[fan2014a] Zhengjie Fan,
Concise pattern learning for RDF data sets interlinking,
Thèse d'informatique, Université de Grenoble, Grenoble (FR), April 2014
https://exmo.inria.fr/files/thesis/thesis-fan.pdf

There are many data sets being published on the web with Semantic Web technology. The data sets contain analogous data which represent the same resources in the world. If these data sets are linked together by correctly building links, users can conveniently query data through a uniform interface, as if they are querying one data set. However, finding correct links is very challenging because there are many instances to compare. Many existing solutions have been proposed for this problem. (1) One straight-forward idea is to compare the attribute values of instances for identifying links, yet it is impossible to compare all possible pairs of attribute values. (2) Another common strategy is to compare instances according to attribute correspondences found by instance-based ontology matching, which can generate attribute correspondences based on instances. However, it is hard to identify the same instances across data sets, because there are the same instances whose attribute values of some attribute correspondences are not equal. (3) Many existing solutions leverage Genetic Programming to construct interlinking patterns for comparing instances, while they suffer from long running time. In this thesis, an interlinking method is proposed to interlink the same instances across different data sets, based on both statistical learning and symbolic learning. The input is two data sets, class correspondences across the two data sets and a set of sample links that are assessed by users as either "positive" or "negative". The method builds a classifier that distinguishes correct links and incorrect links across two RDF data sets with the set of assessed sample links. The classifier is composed of attribute correspondences across corresponding classes of two data sets, which help compare instances and build links. The classifier is called an interlinking pattern in this thesis. On the one hand, our method discovers potential attribute correspondences of each class correspondence via a statistical learning method, the K-medoids clustering algorithm, with instance value statistics. On the other hand, our solution builds the interlinking pattern by a symbolic learning method, Version Space, with all discovered potential attribute correspondences and the set of assessed sample links. Our method can fulfill the interlinking task that does not have a conjunctive interlinking pattern that covers all assessed correct links with a concise format. Experiments confirm that our interlinking method with only 1% of sample links already reaches a high F-measure (around 0.94-0.99). The F-measure quickly converges, being improved by nearly 10% than other approaches.

[fan2014b] Zhengjie Fan, Jérôme Euzenat, François Scharffe,
Learning concise pattern for interlinking with extended version space,
Dominik l zak, Hung Son Nguyen, Marek Reformat, Eugene Santos (eds), Proc. 13th IEEE/WIC/ACM international conference on web intelligence (WI), Warsaw (PL), pp70-77, 2014

https://exmo.inria.fr/files/publications/fan2014b.pdf

Many data sets on the web contain analogous data which represent the same resources in the world, so it is helpful to interlink different data sets for sharing information. However, finding correct links is very challenging because there are many instances to compare. In this paper, an interlinking method is proposed to interlink instances across different data sets. The input is class correspondences, property correspondences and a set of sample links that are assessed by users as either "positive" or "negative". We apply a machine learning method, Version Space, in order to construct a classifier, which is called interlinking pattern, that can justify correct links and incorrect links for both data sets. We improve the learning method so that it resolves the no-conjunctive-pattern problem. We call it Extended Version Space. Experiments confirm that our method with only 1% of sample links already reaches a high F-measure (around 0.96-0.99). The F-measure quickly converges, being improved by nearly 10% than other comparable approaches.

[fionda2011a] Valeria Fionda, Giuseppe Pirrò,

BioTRON: A biological workflow management system,

William Chu, Eric Wong, Mathew Palakal, Chih-Cheng Hung (eds), Proc. 26th ACM symposium on applied computing (SAC), Taipei (TW), pp77-82, 2011

Bioinformatics tasks may become very complex and usually require to manually integrate both data and results from different knowledge sources and tools. In this scenario, an integrated environment for designing and executing complex biological workflows is a must. Even though several efforts are trying to cope with this aspects, they mostly focus on gene or protein sequence analysis underestimating more complex biological data such as molecular interaction data. The aim of this paper is to present the BioTRON system, which supports biologists in the various steps necessary to perform complex biological tasks such as biological network comparison. BioTRON also features a mechanism to automatically integrate even existing on-line Web services. We present the BioTRON architecture along with a real example, which shows the suitability of the tool.

[gangemi2008a] Aldo Gangemi, Jérôme Euzenat (eds),

Knowledge engineering: practice and patterns (Proc. 16th International conference on knowledge engineering and knowledge management (EKAW)),

Lecture notes in artificial intelligence 5268, 2008

http://www.springerlink.com/content/978-3-540-87695-3/

[garciacastro2014a] Raúl García Castro, María Poveda Villalón, Filip Radulovic, Asunción Gómez Pérez, Jérôme Euzenat, Luz Maria Priego, Georg Vogt, Simon Robinson, Strahil Birov, Bruno Fies, Jan Peters-Anders,

Strategy for energy measurement and interoperability,

Deliverable 3.1, Ready4SmartCities, 28p., January 2014

https://exmo.inria.fr/files/reports/r4sc-31.pdf

[gmati2016a] Maroua Gmati, Manuel Atencia, Jérôme Euzenat,

Tableau extensions for reasoning with link keys,

Pavel Shvaiko, Jérôme Euzenat, Ernesto Jiménez-Ruiz, Michelle Cheatham, Oktie Hassanzadeh, Ryutaro Ichise (eds), Proc. 11th ISWC workshop on ontology matching (OM), Kobe (JP), pp37-48, 2016

http://ceur-ws.org/Vol-1766/om2016_Tpaper4.pdf
https://exmo.inria.fr/files/publications/gmati2016a.pdf

Link keys allow for generating links across data sets expressed in different ontologies. But they can also be thought of as axioms in a description logic. As such, they can contribute to infer ABox axioms, such as links, or terminological axioms and other link keys. Yet, no reasoning support exists for link keys. Here we extend the tableau method designed for ALC to take link keys into account. We show how this extension enables combining link keys with terminological reasoning with and without ABox and TBox and generate non trivial link keys.

[gomez-perez2005a] Asunción Gómez Pérez, Jérôme Euzenat (eds),

The semantic web: research and applications (Proc. 2nd conference on european semantic web conference (ESWC)),

Lecture notes in computer science 3532, 2005

http://www.springeronline.com/3-540-26124-9

[hauswirth2010a] Manfred Hauswirth, Jérôme Euzenat, Owen Friel, Keith Griffin, Pat Hession, Brendan Jennings, Tudor Groza, Siegfried Handschuh, Ivana Podnar Zarko, Axel Polleres, Antoine Zimmermann,

Towards consolidated presence,
Proc. 6th International conference on collaborative computing: networking, applications and worksharing (CollaborateCom), Chicago (IL US), pp1-10, 2010
http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=5767052
https://exmo.inria.fr/files/publications/hauswirth2010a.pdf

Presence management, i.e., the ability to automatically identify the status and availability of communication partners, is becoming an invaluable tool for collaboration in enterprise contexts. In this paper, we argue for efficient presence management by means of a holistic view of both physical context and virtual presence in online communication channels. We sketch the components for enabling presence as a service integrating both online information as well as physical sensors, discussing benefits, possible applications on top, and challenges of establishing such a service.

[hitzler2005a] Pascal Hitzler, Jérôme Euzenat, Markus Krötzsch, Luciano Serafini, Heiner Stuckenschmidt, Holger Wache, Antoine Zimmermann,
Integrated view and comparison of alignment semantics,
Deliverable 2.2.5, Knowledge web, 32p., December 2005
https://exmo.inria.fr/files/reports/kweb-225.pdf

We take a general perspective on alignment in order to develop common theoretical foundations for the subject. The deliverable comprises a comparative study of different mapping languages by means of distributed first-order logic, and a study on category-theoretical modelling of alignment and merging by means of pushout-combinations.

[hoffmann2010a] Patrick Hoffmann, Mathieu d'Aquin, Jérôme Euzenat, Chan Le Duc, Marta Sabou, François Scharffe,
Context-based matching revisited,
Deliverable 3.3.5, NeOn, 39p., 2010
https://exmo.inria.fr/files/reports/neon-335.pdf

Matching ontologies can be achieved by first recontextualising ontologies and then using this context information in order to deduce the relations between ontology entities. In Deliverable 3.3.1, we introduced the Scarlet system which uses ontologies on the web as context for matching ontologies. In this deliverable, we push this further by systematising the parameterisation of Scarlet. We develop a framework for expressing context-based matching parameters and implement most of them within Scarlet. This allows for evaluating the impact of each of these parameters on the actual results of context-based matching.

[hori2003a] Masahiro Hori, Jérôme Euzenat, Peter Patel-Schneider,
OWL Web Ontology Language XML Presentation Syntax,
Note, Worldwide web consortium, Cambridge (MA US), 2003
http://www.w3.org/TR/owl-xmlsyntax
http://exmo.inrialpes.fr/papers/owl-xmlsyntax

This document describes an XML presentation syntax and XML Schemas for OWL 1.0 sublanguages: OWL Lite, OWL DL, and OWL Full. This document has been written to meet the requirement that OWL 1.0 should have an XML serialization syntax (R15 in [OWL Requirement]). It is not intended to be a normative specification. Instead, it represents a suggestion of one possible XML presentation syntax for OWL.

[hukkalainen2015a] Mari Hukkalainen, Matti Hannus, Kalevi Piira, Elina Grahn, Ha Hoang, Andrea Cavallaro, Raúl García Castro, Bruno Fies, Thanasis Tryferidis, Kleopatra Zoi Tsagkari, Jérôme Euzenat, Florian Judex, Daniele Basciotti, Charlotte Marguerite, Ralf-Roman Schmidt, Strahil Birov, Simon Robinson, Georg Vogt,
Innovation and research roadmap,
Deliverable 5.6, Ready4SmartCities, 63p., September 2015
https://exmo.inria.fr/files/reports/r4sc-56.pdf

[inants2015a] Armen Inants, Jérôme Euzenat,
An algebra of qualitative taxonomical relations for ontology alignments,
Proc. 14th conference on International semantic web conference (ISWC), Bethleem (PA US), (Marcelo Arenas, Óscar Corcho, Elena Simperl, Markus Strohmaier, Mathieu d'Aquin, Kavitha Srinivas, Paul Groth, Michel Dumontier, Jeff Heflin, Krishnaprasad Thirunarayan, Steffen Staab (eds), The Semantic Web - ISWC 2015. 14th International Semantic Web Conference, Bethlehem, Pennsylvania, United

States, October 11-15, 2015, *Lecture notes in computer science* 9366, 2015), pp253-268, 2015
https://exmo.inria.fr/files/publications/inants2015a.pdf

Algebras of relations were shown useful in managing ontology alignments. They make it possible to aggregate alignments disjunctively or conjunctively and to propagate alignments within a network of ontologies. The previously considered algebra of relations contains taxonomical relations between classes. However, compositional inference using this algebra is sound only if we assume that classes which occur in alignments have nonempty extensions. Moreover, this algebra covers relations only between classes. Here we introduce a new algebra of relations, which, first, solves the limitation of the previous one, and second, incorporates all qualitative taxonomical relations that occur between individuals and concepts, including the relations "is a" and "is not". We prove that this algebra is coherent with respect to the simple semantics of alignments.

[inants2016a] Armen Inants,

Qualitative calculi with heterogeneous universes,

Thèse d'informatique, Université de Grenoble, Grenoble (FR), April 2016
https://exmo.inria.fr/files/thesis/thesis-inants.pdf

Qualitative representation and reasoning operate with non-numerical relations holding between objects of some universe. The general formalisms developed in this field are based on various kinds of algebras of relations, such as Tarskian relation algebras. All these formalisms, which are called qualitative calculi, share an implicit assumption that the universe is homogeneous, i.e., consists of objectsof the same kind. However, objects of different kinds may also entertain relations. The state of the art of qualitative reasoning does not offer a general combination operation of qualitative calculi for different kinds of objects into a single calculus. Many applications discriminate between different kinds of objects. For example, some spatial models discriminate between regions, lines and points, and different relations are used for each kind of objects. In ontology matching, qualitative calculi were shown useful for expressing alignments between only one kind of entities, such as concepts or individuals. However, relations between individuals and concepts, which impose additional constraints, are not exploited. This dissertation introduces modularity in qualitative calculi and provides a methodology for modeling qualitative calculi with heterogeneous universes. Our central contribution is a framework based on a special class of partition schemes which we call modular. For a qualitative calculus generated by a modular partition scheme, we define a structure that associates each relation symbol with an abstract domain and codomain from a Boolean lattice of sorts. A module of such a qualitative calculus is a sub-calculus restricted to a given sort, which is obtained through an operation called relativization to a sort. Of a greater practical interest is the opposite operation, which allows for combining several qualitative calculi into a single calculus. We define an operation called combination modulo glue, which combines two or more qualitative calculi over different universes, provided some glue relations between these universes. The framework is general enough to support most known qualitative spatio-temporal calculi.

[inants2016b] Armen Inants, Manuel Atencia, Jérôme Euzenat,

Algebraic calculi for weighted ontology alignments,

Proc. 15th conference on International semantic web conference (ISWC), Kobe (JP), (Paul Groth, Elena Simperl, Alasdair Gray, Marta Sabou, Markus Krötzsch, Freddy Lécué, Fabian Flöck, Yolanda Gil (eds), The Semantic Web - ISWC 2016, *Lecture notes in computer science* 9981, 2016), pp360-375, 2016
https://exmo.inria.fr/files/publications/inants2016b.pdf

Alignments between ontologies usually come with numerical attributes expressing the confidence of each correspondence. Semantics supporting such confidences must generalise the semantics of alignments without confidence. There exists a semantics which satisfies this but introduces a discontinuity between weighted and non-weighted interpretations. Moreover, it does not provide a calculus for reasoning with weighted ontology alignments. This paper introduces a calculus for such alignments. It is given by an infinite relation-type algebra, the elements of which are weighted taxonomic relations. In addition, it approximates the non-weighted case in a continuous manner.

[jung2005a] Jason Jung, Inay Ha, Geun-Sik Jo,

BlogGrid: towards an efficient information pushing service on blogspaces,

Proc. 4th conference on International Conference on Grid and Cooperative Computing (GCC), Beijing (CN), (Hai Zhuge, Geoffrey Fox (eds), Grid and cooperative computing, *Lecture notes in computer science* 3795, 2005), pp178-183, 2005

With increasing concerns about the personalized information space, users have been posting various types of information on their own blogs. Due to the domain-specific properties of blogging systems, however, searching relevant information is too difficult. In this paper, we focus on analyzing the user behaviors on blogspace, so that the channel between two similar users can be virtually generated. Eventually, social grid environment can be constructed on blog organization. We therefore propose a BlogGrid framework to provide the information pushing service without any user intervention.

[jung2006a] Jason Jung, Jérôme Euzenat,
From Personal Ontologies to Socialized Semantic Space,
Proc. 3rd ESWC poster session , Budva (ME), 2006
https://exmo.inria.fr/files/publications/jung2006a.pdf

We have designed a three-layered model which involves the networks between people, the ontologies they use, and the concepts occurring in these ontologies. We propose how relationships in one network can be extracted from relationships in another one based on analysis techniques relying on this network specificity. For instance, similarity in the ontology layer can be extracted from a similarity measure on the concept layer.

[jung2006b] Jason Jung, Jérôme Euzenat,
Measuring semantic centrality based on building consensual ontology on social network,
Proc. 2nd ESWS workshop on semantic network analysis (SNA), Budva (ME), pp27-39, 2006
https://exmo.inria.fr/files/publications/jung2006b.pdf

We have been focusing on three-layered socialized semantic space, consisting of social, ontology, and concept layers. In this paper, we propose a new measurement of semantic centrality of people, meaning the power of semantic bridging, on this architecture. Thereby, the consensual ontologies are discovered by semantic alignment-based mining process in the ontology and concept layer. It is represented as the maximal semantic substructures among personal ontologies of semantically interlinked community. Finally, we have shown an example of semantic centrality applied to resource annotation on social network, and discussed our assumptions used in formulation of this measurement.

[jung2007a] Jason Jung, Jérôme Euzenat,
Towards semantic social networks,
Proc. 4th conference on European semantic web conference (ESWC), Innsbruck (AT), (Enrico Franconi, Michael Kifer, Wolfgang May (eds), The semantic web: research and applications (Proc. 4th conference on European semantic web conference (ESWC)), *Lecture notes in computer science* 4273, 2007), pp267-280, 2007
https://exmo.inria.fr/files/publications/jung2007a.pdf

Computer manipulated social networks are usually built from the explicit assertion by users that they have some relation with other users or by the implicit evidence of such relations (e.g., co-authoring). However, since the goal of social network analysis is to help users to take advantage of these networks, it would be convenient to take more information into account. We introduce a three-layered model which involves the network between people (social network), the network between the ontologies they use (ontology network) and a network between concepts occurring in these ontologies. We explain how relationships in one network can be extracted from relationships in another one based on analysis techniques relying on this network specificity. For instance, similarity in the ontology network can be extracted from a similarity measure on the concept network. We illustrate the use of these tools for the emergence of consensus ontologies in the context of semantic peer-to-peer systems.

[jung2007b] Jason Jung, Antoine Zimmermann, Jérôme Euzenat,
Concept-based query transformation based on semantic centrality in semantic peer-to-peer environment,
Proc. 9th Conference on Asia-Pacific web (APWeb), Huang Shan (CN), (Guozhu Dong, Xuemin Lin, Wei Wang, Yun Yang, Jeffrey Xu Yu (eds), Advances in data and web management (Proc. 9th Conference on Asia-Pacific web (APWeb)), *Lecture notes in computer science* 4505, 2007), pp622-629, 2007
https://exmo.inria.fr/files/publications/jung2007b.pdf

Query transformation is a serious hurdle on semantic peer-to-peer environment. The problem is that the transformed queries might lose some information from the original one, as continuously traveling p2p networks. We mainly consider two factors; i) number of transformations and// ii) quality of ontology alignment. In this paper, we propose semantic centrality (SC) measurement meaning the power of semantic bridging on semantic p2p environment. Thereby, we want to build semantically cohesive user subgroups, and find out the best peers for query transformation, i.e., minimizing information loss. We have shown an example for retrieving image resources annotated on p2p environment by using query transformation based on SC.

[kovalenko2016a] Olga Kovalenko, Jérôme Euzenat,
Semantic matching of engineering data structures,
In: Stefan Biffl, Marta Sabou (eds), Semantic web technologies for intelligent engineering applications,

Springer, Heidelberg (DE), 2016, pp137-157
http://link.springer.com/chapter/10.1007%2F978-3-319-41490-4_6
https://exmo.inria.fr/files/publications/kovalenko2016a.pdf

An important element of implementing a data integration solution in multi-disciplinary engineering settings, consists in identifying and defining relations between the different engineering data models and data sets that need to be integrated. The ontology matching field investigates methods and tools for discovering relations between semantic data sources and representing them. In this chapter, we look at ontology matching issues in the context of integrating engineering knowledge. We first discuss what types of relations typically occur between engineering objects in multi-disciplinary engineering environments taking a use case in the power plant engineering domain as a running example. We then overview available technologies for mappings definition between ontologies, focusing on those currently most widely used in practice and briefly discuss their capabilities for mapping representation and potential processing. Finally, we illustrate how mappings in the sample project in power plant engineering domain can be generated from the definitions in the Expressive and Declarative Ontology Alignment Language (EDOAL).

[laborie2004a] Sébastien Laborie,
Adaptation de documents multimédia : Approche sémantique de la dimension spatiotemporelle des documents SMIL,
Mémoire de mastère d'informatique, Université Joseph Fourier-INPG, Grenoble (FR), 2004
https://exmo.inria.fr/files/reports/m2r-laborie.pdf

L'essor du multimédia permet le développement de nombreuses applications mariant les technologies de l'écrit, de l'image et du son. D'autre part, les récentes avancées technologiques permettent aux documents multimédia d'être présent sur de nombreuses plates-formes (téléphones portables, PDA, ordinateurs de bureau...). Cette diversification des utilisations et des supports a entraîné un besoin d'adaptation des documents à leur contexte d'exécution. Pour assurer la proximité entre un document adapté et son document source, une approche sémantique a été développée à partir de spécifications qualitatives des documents multimédia. Notre travail consiste à étendre cette approche à un langage exécutable de documents : SMIL. Un document SMIL ne pouvant être directement adapté avec l'approche proposée, nous introduisons diverses transformations des spécifications de documents en SMIL vers des descriptions qualitatives dont nous montrons quÕelles assurent la propriété de neutralité. De plus, l'approche sémantique ayant été initialement appliquée uniquement à la dimension temporelle, nous l'appliquons par la suite à la dimension spatio-temporelle des documents SMIL. Enfin, nous raffinons les mesures de proximité à l'aide de graphes de voisinage adaptés au type d'objets multimédia manipulés ainsi qu'au type de langage de spécification utilisé.

[laborie2005a] Sébastien Laborie, Jérôme Euzenat, Nabil Layaïda,
Adapter temporellement un document SMIL,
Actes atelier plate-forme AFIA 2005 sur Connaissance et document temporel, Nice (FR), pp47-58, 2005
https://exmo.inria.fr/files/publications/laborie2005a.pdf

Les récentes avancées technologiques permettent aux documents multimédia d'être présentés sur de nombreuses plates-formes (ordinateurs de bureau, PDA, téléphones portables...). Cette diversification des supports a entraîné un besoin d'adaptation des documents à leur contexte d'exécution. Dans [Euzenat2003b], une approche sémantique d'adaptation de documents multimédia a été proposée et temporellement définie à l'aide de l'algèbre d'intervalles d'Allen. Cet article étend ces précédents travaux en les appliquant au langage de spécification de documents multimédia SMIL. Pour cela, des fonctions de traduction de SMIL vers l'algèbre de Allen (et inversement) ont été définies. Celles-ci préservent la proximité entre le document adapté et le document initial. Enfin, ces fonctions ont été articulées avec [Euzenat2003b].

[laborie2006a] Sébastien Laborie, Jérôme Euzenat, Nabil Layaïda,
Adaptation spatiale efficace de documents SMIL,
Actes 15e conférence AFIA-AFRIF sur reconnaissance des formes et intelligence artificielle (RFIA), Tours (FR), pp127, 2006
https://exmo.inria.fr/files/publications/laborie2006a.pdf

La multiplication des supports de présentation multimédia entraîne un besoin d'adaptation des documents à leur contexte d'exécution. Nous avons proposé une approche sémantique d'adaptation de documents multimédia qui a été temporellement définie à l'aide de l'algèbre d'intervalles d'Allen. Cet article étend ces précédents travaux à la dimension spatiale des documents SMIL. Notre objectif est de trouver une représentation spatiale qualitative permettant de calculer un ensemble de solutions d'adaptation proche du document initial. La qualité d'une adaptation se mesure à deux niveaux: expressivité des solutions d'adaptation et rapidité de calcul. Dans ce contexte, nous caractérisons la qualité de l'adaptation selon plusieurs types de représentations spatiales existantes. Nous montrons que ces représentations ne permettent pas d'avoir une qualité d'adaptation optimale. Nous proposons alors une nouvelle représentation spatiale suffisament expressive permettant d'adapter rapidement des documents multimédia SMIL.

[laborie2006b] Sébastien Laborie,
Spatio-temporal proximities for multimedia document adaptation,
Proc. 12th conference on Artificial intelligence: methodology, systems and applications (AIMSA), Varna (BG), (Jérôme Euzenat, John Domingue (eds), Artificial intelligence: methodology, systems and applications (Proc. 12th conference on Artificial intelligence: methodology, systems and applications (AIMSA)), *Lecture notes in computer science* 4183, 2006), pp128-137, 2006
The multiplication of execution contexts for multimedia documents requires the adaptation of the document specification to the particularities of the contexts. In this paper, we propose to apply a semantic approach for multimedia document adaptation to the spatio-temporal dimension of documents. To guarantee that the adapted document is close to the initial one respecting adaptation constraints, we define proximities for adapting static documents (i.e., documents without animations) and animated documents. Moreover, we show that these proximities can be refined according to multimedia object properties (e.g., images, videos...). The approach is illustrated by an example.

[laborie2006c] Sébastien Laborie, Jérôme Euzenat, Nabil Layaïda,
A spatial algebra for multimedia document adaptation,
Yannis Avrithis, Yiannis Kompatsiaris, Steffen Staab, Noel O'Connor (eds), Proc. 1st International Conference on Semantic and Digital Media Technologies poster session (SAMT), Athens (GR), pp7-8, 2006
The multiplication of execution contexts for multimedia documents requires the adaptation of document specifications. This paper instantiates our previous semantic approach for multimedia document adaptation to the spatial dimension of multimedia documents. Our goal is to find a qualitative spatial representation that computes, in a reasonable time, a set of adaptation solutions close to the initial document satisfying a profile. The quality of an adaptation can be regarded in two respects: expressiveness of adaptation solutions and computation speed. In this context, we propose a new spatial representation sufficiently expressive to adapt multimedia documents faster.

[laborie2006d] Sébastien Laborie, Jérôme Euzenat,
Adapting the hypermedia structure in a generic multimedia adaptation framework,
Phivos Mylonas, Manolis Wallace, Marios Angelides (eds), Proc. 1st International Workshop on Semantic Media Adaptation and Personalization (SMAP), Athens (GR), pp62-67, 2006
The multiplication of execution contexts for multimedia documents requires the adaptation of document specifications. We proposed a semantic approach for multimedia document adaptation. This paper extends this framework to the hypermedia dimension of multimedia documents, i.e., hypermedia links between multimedia objects. By considering hypermedia links as particular objects of the document, it is possible to adapt the hypermedia dimension with other dimensions like the temporal one. However, due to the hypermedia structure, several specifications have to be considered. Thus, to preserve our adaptation framework, we propose a first straightforward strategy that consists of adapting all specifications generated by the hypermedia structure. However, we show that this one has several drawbacks, e.g., its high computational costs. Hence, we propose to adapt document specifications step by step according to the user interactions.

[laborie2006e] Sébastien Laborie, Jérôme Euzenat, Nabil Layaïda,
Adaptation sémantique de documents SMIL,
Actes journées de travail interdisciplinaire sur autour des documents structurés, Giens (FR), pp1-5, 2006
https://exmo.inria.fr/files/publications/laborie2006e.pdf

[laborie2007a] Sébastien Laborie, Jérôme Euzenat, Nabil Layaïda,
Multimedia document summarization based on a semantic adaptation framework,
Proc. 1st international workshop on Semantically aware document processing and indexing (SADPI), Montpellier (FR), (Henri Betaille, Jean-Yves Delort, Peter King, Marie-Laure Mugnier, Jocelyne Nanard, Marc Nanard (eds), (Proc. 1st international workshop on Semantically aware document processing and indexing (SADPI)), ACM Press, 2007), pp87-94, 2007
https://exmo.inria.fr/files/publications/laborie2007a.pdf
The multiplication of presentation contexts (such as mobile phones, PDAs) for multimedia documents requires the adaptation of document specifications. In an earlier work, a semantic framework for multimedia document adaptation was proposed. This framework deals with the semantics of the document composition by transforming the relations between multimedia objects. However, it was lacking the capability of suppressing multimedia objects. In this paper, we extend the proposed adaptation with this capability. Thanks to this extension, we present a method for summarizing multimedia documents. Moreover, when multimedia objects are removed, the resulted document satisfies some

properties such as presentation contiguity. To validate our framework, we adapt standard multimedia documents such as SMIL documents.

[laborie2007b] Sébastien Laborie, Antoine Zimmermann,
A framework for media adaptation using the web and the semantic web,
Proc. 2nd international workshop on semantic media adaptation and personalization (SMAP), London (UK), (Phivos Mylonas, Manolis Wallace, Marios Angelides (eds), (Proc. 2nd international workshop on semantic media adaptation and personalization (SMAP)), IEEE Computer society, Los Alamitos (CA US), 2007), pp32-37, 2007
Best paper award
https://exmo.inria.fr/files/publications/laborie2007b.pdf

The World Wide Web can be accessed through a number of different devices, each having its own capabilities and limitations. Additionally, the content of the Web is increasing tremendously in size and variety. Yet, many devices do not embed support for all types of media and formats. Therefore, in order to provide as much information as possible to all kind of devices, media items have to be adapted. In this paper, we propose to adapt them by replacing incompatible media items by others found on the Web. The adapted media items must convey the same message as the original ones, while satisfying the target profile. We present a possible architecture to implement this and we show that search engines can already achieve this to a limited extent. Nonetheless, some results are unsatisfactory because media annotations lack semantics, are partial and are heterogeneous. Hence, we propose to use Semantic Web technologies, such as RDF descriptions, ontologies, ontology merging and matching, in order to select better alternatives, thus improving this adaptation framework.

[laborie2008a] Sébastien Laborie, Jérôme Euzenat,
An incremental framework for adapting the hypermedia structure of multimedia documents,
In: Manolis Wallace, Marios Angelides, Phivos Mylonas (eds), Advances in Semantic Media Adaptation and Personalization, Springer, Heidelberg (DE), 2008, pp157-176
https://exmo.inria.fr/files/publications/laborie2008a.pdf

The multiplication of presentation contexts (such as mobile phones, PDAs) for multimedia documents requires the adaptation of document specifications. In an earlier work, a semantic approach for multimedia document adaptation was proposed. This framework deals with the semantics of the document composition by transforming the relations between multimedia objects. In this chapter, we apply the defined framework to the hypermedia dimension of documents, i.e., hypermedia links between multimedia objects. By considering hypermedia links as particular objects of the document, we adapt the hypermedia dimension with the temporal dimension. However, due to the non-deterministic character of the hypermedia structure, the document is organized in several loosely dependent sub-specifications. To preserve the adaptation framework, we propose a first straightforward strategy that consists of adapting all sub-specifications generated by the hypermedia structure. Nevertheless, this strategy has several drawbacks, e.g., the profile is not able to change between user interactions. Hence, we propose an incremental approach which adapts document sub-specifications step by step according to these interactions. To validate this framework, we adapt real standard multimedia documents such as SMIL documents.

[laborie2008b] Sébastien Laborie,
Adaptation sémantique de documents multimédia,
Thèse d'informatique, Université Joseph Fourier, Grenoble (FR), mai 2008
https://exmo.inria.fr/files/thesis/these-laborie.pdf

Un document multimédia marie les technologies de l'écrit, de l'image et du son. Actuellement, les documents multimédia doivent pouvoir être exécutés sur de nombreuses plates-formes (téléphones portables, PDA, ordinateurs de bureau, lecteurs de salon...). Cette diversification des utilisations et des supports nécessite l'adaptation des documents à leur contexte d'exécution, parfois imprévisible au moment de la conception du document. Pour s'affranchir des langages ou formats de description multimédia, nous abstrayons les documents en une structure exprimant l'ensemble des relations entre objets du document. Les relations entre objets sont d'ordre temporel, spatial, hypermédia voire inter-dimensionnel, et peuvent être de nature qualitative. Cette structure capture la sémantique des documents car elle est capable de couvrir chacune de ses exécutions potentielles. Dans ce contexte, adapter va consister à calculer un ensemble d'exécutions le plus proche possible de ces exécutions potentielles qui satisfont les contraintes d'adaptation imposées par une plate-forme cible. À cet effet, les relations de la structure abstraite sont modifiées de sorte de satisfaire ces contraintes d'adaptation. Nous montrons, pour chaque dimension du document, comment réaliser ceci de manière réaliste. Afin de montrer l'applicabilité d'une telle approche, nous la développons dans un cadre adapté au standard SMIL pour lequel nous déclinons les adaptations spatiales, temporelles, spatio-temporelles et hypermédia. Nous sommes amenés à développer des techniques spécifiques pour les représentations spatiales et temporelles efficaces. Nous explorons aussi des approches impliquant la suppression d'objets.

[laborie2008c] Sébastien Laborie, Jérôme Euzenat, Nabil Layaïda,
Adaptation spatio-temporelle et hypermédia de documents multimédia,
Actes atelier sur représentation et raisonnement sur le temps et l'espace (RTE), Montpellier (FR), pp1-13, 2008
https://exmo.inria.fr/files/publications/laborie2008c.pdf

[laborie2009a] Sébastien Laborie, Jérôme Euzenat, Nabil Layaïda,
Semantic multimedia document adaptation with functional annotations,
Proc. 4th international workshop on Semantic Media Adaptation and Personalization (SMAP2009), San Sebastián (ES), pp44-49, 2009
https://exmo.inria.fr/files/publications/laborie2009a.pdf

The diversity of presentation contexts (such as mobile phones, PDAs) for multimedia documents requires the adaptation of document specifications. In an earlier work, we have proposed a semantic adaptation framework for multimedia documents. This framework captures the semantics of the document composition and transforms the relations between multimedia objects according to adaptation constraints. In this paper, we show that capturing only the document composition for adaptation is unsatisfactory because it leads to a limited form of adapted solutions. Hence, we propose to guide adaptation with functional annotations, i.e., annotations related to multimedia objects which express a function in the document. In order to validate this framework, we propose to use RDF descriptions from SMIL documents and adapt such documents with our interactive adaptation prototype.

[laborie2011a] Sébastien Laborie, Jérôme Euzenat, Nabil Layaïda,
Semantic adaptation of multimedia documents,
Multimedia tools and applications 55(3):379-398, 2011
https://exmo.inria.fr/files/publications/laborie2011a.pdf

Multimedia documents have to be played on multiple device types. Hence, usage and platform diversity requires document adaptation according to execution contexts, not generally predictable at design time. In an earlier work, a semantic framework for multimedia document adaptation was proposed. In this framework, a multimedia document is interpreted as a set of potential executions corresponding to the author specification. To each target device corresponds a set of possible executions complying with the device constraints. In this context, adapting requires to select an execution that satisfies the target device constraints and which is as close as possible from the initial composition. This theoretical adaptation framework does not specifically consider the main multimedia document dimensions, i.e., temporal, spatial and hypermedia. In this paper, we propose a concrete application of this framework on standard multimedia documents. For that purpose, we first define an abstract structure that captures the spatio-temporal and hypermedia dimensions of multimedia documents, and we develop an adaptation algorithm which transforms in a minimal way such a structure according to device constraints. Then, we show how this can be used for adapting concrete multimedia documents in SMIL through converting the documents in the abstract structure, using the adaptation algorithm, and converting it back in SMIL. This can be used for other document formats without modifying the adaptation algorithm.

[laera2006a] Loredana Laera, Valentina Tamma, Trevor Bench-Capon, Jérôme Euzenat,
Agent-based argumentation for ontology alignments,
Proc. 6th ECAI workshop on Computational models of natural argument (CMNA), Riva del Garda (IT), pp40-46, 2006
https://exmo.inria.fr/files/publications/laera2006a.pdf

When agents communicate they do not necessarily use the same vocabulary or ontology. For them to interact successfully they must find correspondences between the terms used in their ontologies. While many proposals for matching two agent ontologies have been presented in the literature, the resulting alignment may not be satisfactory to both agents and can become the object of further negotiation between them. This paper describes our work constructing a formal framework for reaching agents' consensus on the terminology they use to communicate. In order to accomplish this, we adapt argument-based negotiation used in multi-agent systems to deal specifically with arguments that support or oppose candidate correspondences between ontologies. Each agent can decide according to its interests whether to accept or refuse the candidate correspondence. The proposed framework considers arguments and propositions that are specific to the matching task and related to the ontology semantics. This argumentation framework relies on a formal argument manipulation schema and on an encoding of the agents preferences between particular kinds of arguments. The former does not vary between agents, whereas the latter depends on the interests of each agent. Therefore, this work distinguishes clearly between the alignment rationales valid for all agents and those specific to a particular agent.

[laera2006b] Loredana Laera, Valentina Tamma, Jérôme Euzenat, Trevor Bench-Capon, Terry Payne,

Reaching agreement over ontology alignments,
Proc. 5th conference on International semantic web conference (ISWC), Athens (GA US), (Isabel Cruz, Stefan Decker, Dean Allemang, Chris Preist, Daniel Schwabe, Peter Mika, Michael Uschold, Lora Aroyo (eds), The semantic web - ISWC 2006 (Proc. 5th conference on International semantic web conference (ISWC)), *Lecture notes in computer science* 4273, 2006), pp371-384, 2006
http://iswc2006.semanticweb.org/items/Laera2006oz.pdf
https://exmo.inria.fr/files/publications/laera2006b.pdf

When agents communicate, they do not necessarily use the same vocabulary or ontology. For them to interact successfully, they must find correspondences (mappings) between the terms used in their respective ontologies. While many proposals for matching two agent ontologies have been presented in the literature, the resulting alignment may not be satisfactory to both agents, and thus may necessitate additional negotiation to identify a mutually agreeable set of correspondences. We propose an approach for supporting the creation and exchange of different arguments, that support or reject possible correspondences. Each agent can decide, according to its preferences, whether to accept or refuse a candidate correspondence. The proposed framework considers arguments and propositions that are specific to the matching task and are based on the ontology semantics. This argumentation framework relies on a formal argument manipulation schema and on an encoding of the agents' preferences between particular kinds of arguments. Whilst the former does not vary between agents, the latter depends on the interests of each agent. Thus, this approach distinguishes clearly between alignment rationales which are valid for all agents and those specific to a particular agent.

[laera2006c] Loredana Laera, Valentina Tamma, Jérôme Euzenat, Trevor Bench-Capon, Terry Payne,
Arguing over ontology alignments,
Proc. 1st ISWC 2006 international workshop on ontology matching (OM), Athens (GA US), pp49-60, 2006
http://ceur-ws.org/Vol-225/paper5.pdf
https://exmo.inria.fr/files/publications/laera2006c.pdf

In open and dynamic environments, agents will usually differ in the domain ontologies they commit to and their perception of the world. The availability of Alignment Services, that are able to provide correspondences between two ontologies, is only a partial solution to achieving interoperability between agents, because any given candidate set of alignments is only suitable in certain contexts. For a given context, different agents might have different and inconsistent perspectives that reflect their differing interests and preferences on the acceptability of candidate mappings, each of which may be rationally acceptable. In this paper we introduce an argumentation-based negotiation framework over the terminology they use in order to communicate. This argumentation framework relies on a formal argument manipulation schema and on an encoding of the agents preferences between particular kinds of arguments. The former does not vary between agents, whereas the latter depends on the interests of each agent. Thus, this approach distinguishes clearly between the alignment rationales valid for all agents and those specific to a particular agent.

[laera2007a] Loredana Laera, Ian Blacoe, Valentina Tamma, Terry Payne, Jérôme Euzenat, Trevor Bench-Capon,
Argumentation over Ontology Correspondences in MAS,
Proc. 6th International conference on Autonomous Agents and Multiagent Systems (AAMAS), Honolulu (HA US), pp1285-1292, 2007
http://www.aamas-conference.org/Proceedings/aamas07/html/AAMAS07_0321_4301ade6dd0b327107925
https://exmo.inria.fr/files/publications/laera2007a.pdf

In order to support semantic interoperation in open environments, where agents can dynamically join or leave and no prior assumption can be made on the ontologies to align, the different agents involved need to agree on the semantics of the terms used during the interoperation. Reaching this agreement can only come through some sort of negotiation process. Indeed, agents will differ in the domain ontologies they commit to; and their perception of the world, and hence the choice of vocabulary used to represent concepts. We propose an approach for supporting the creation and exchange of different arguments, that support or reject possible correspondences. Each agent can decide, according to its preferences, whether to accept or refuse a candidate correspondence. The proposed framework considers arguments and propositions that are specific to the matching task and are based on the ontology semantics. This argumentation framework relies on a formal argument manipulation schema and on an encoding of the agents' preferences between particular kinds of arguments.

[leduc2008a] Chan Le Duc, Mathieu d'Aquin, Jesús Barrasa, Jérôme David, Jérôme Euzenat, Raul Palma, Rosario Plaza, Marta Sabou, Boris Villazón-Terrazas,
Matching ontologies for context: The NeOn Alignment plug-in,
Deliverable 3.3.2, NeOn, 59p., 2008

https://exmo.inria.fr/files/reports/neon-332.pdf

This deliverable presents the software support provided by the NeOn toolkit for matching ontologies, and in particular, recontextualise them. This support comes through the NeOn Alignment plug-in which integrates the Alignment API and offers access to Alignment servers in the NeOn toolkit. We present the NeOn Alignment plug-in as well as several enhancements of the Alignment server: the integration of three matching methods developed within NeOn, i.e., Semantic Mapper, OLA and Scarlet, as well as theconnection of Alignment servers with Oyster.

[leduc2009a] Chan Le Duc,
Decidability of SHI with transitive closure of roles,
Proc. 6th conference on european semantic web conference (ESWC), Heraklion (GR), (Lora Aroyo, Paolo Traverso, Fabio Ciravegna, Philipp Cimiano, Tom Heath, Eero Hyvönen, Riichiro Mizoguchi, Marta Sabou, Elena Simperl (eds), (Proc. 6th european conference on semantic web (ESWC)), *Lecture notes in computer science* 5554, 2009), pp368-383, 2009
https://exmo.inria.fr/files/publications/leduc2009a

This paper investigates a description logic, namely SHI+, which extends SHI by adding transitive closure of roles. The resulting logic SHI+ allows transitive closure of roles to occur not only in concept inclusion axioms but also in role inclusion axioms. We show that SHI+ is decidable by devising a sound and complete algorithm for deciding satisfiability of concepts in SHI+ with respect to a set of concept and role inclusion axioms.

[lesnikova2013a] Tatiana Lesnikova,
Interlinking cross-lingual RDF data sets,
Proc. conference on ESWC PhD symposium, Montpellier (FR), (Philipp Cimiano, Óscar Corcho, Valentina Presutti, Laura Hollink, Sebastian Rudolph (eds), The semantic web: research and applications (Proc. 10th conference on European semantic web conference (ESWC)), *Lecture notes in computer science* 7882, 2012), pp671-675, 2013
https://exmo.inria.fr/files/publications/lesnikova2013a.pdf

Linked Open Data is an essential part of the Semantic Web. More and more data sets are published in natural languages comprising not only English but other languages as well. It becomes necessary to link the same entities distributed across different RDF data sets. This paper is an initial outline of the research to be conducted on cross-lingual RDF data set interlinking, and it presents several ideas how to approach this problem.

[lesnikova2013b] Tatiana Lesnikova,
NLP for interlinking multilingual LOD,
Proc. conference on ISWC Doctoral consortium, Sydney (NSW AU), (Lora Aroyo, Natalya Noy (eds), Proceedings of the ISWC Doctoral Consortium (Proc. conference on ISWC Doctoral Consortium), 2013), pp32-39, 2013
http://ceur-ws.org/Vol-1045/paper-05.pdf
https://exmo.inria.fr/files/publications/lesnikova2013b.pdf

Nowadays, there are many natural languages on the Web, and we can expect that they will stay there even with the development of the Semantic Web. Though the RDF model enables structuring information in a unified way, the resources can be described using different natural languages. To find information about the same resource across different languages, we need to link identical resources together. In this paper we present an instance-based approach for resource interlinking. We also show how a problem of graph matching can be converted into a document matching for discovering cross-lingual mappings across RDF data sets.

[lesnikova2014a] Tatiana Lesnikova, Jérôme David, Jérôme Euzenat,
Interlinking English and Chinese RDF data sets using machine translation,
Johanna Völker, Heiko Paulheim, Jens Lehmann, Harald Sack, Vojtech Svátek (eds), Proc. 3rd ESWC workshop on Knowledge discovery and data mining meets linked open data (Know@LOD), Hersounisos (GR), 2014
http://ceur-ws.org/Vol-1243/paper4.pdf
https://exmo.inria.fr/files/publications/lesnikova2014a.pdf

*Data interlinking is a difficult task particularly in a multilingual environment like the Web. In this paper, we evaluate the suitability of a Machine Translation approach to interlink RDF resources described in English and Chinese languages. We represent resources as text documents, and a similarity between documents is taken for similarity between resources. Documents are represented as vectors using two weighting schemes, then cosine similarity is computed. The experiment demonstrates that TF*IDF with a minimum amount of preprocessing steps can bring high*

results.

[lesnikova2014b] Tatiana Lesnikova,
Interlinking RDF data in different languages,
Christophe Roche, Rute Costa, Eva Coudyzer (eds), Proc. 4th workshop on Terminology and Ontology: Theories and applications (TOTh), Bruxelles (BE), 2014
http://www.porphyre.org/workshop-toth/files/Tatiana_Lesnikova_AthenaPlus-TOTh2014_Interlink
https://exmo.inria.fr/files/publications/lesnikova2014b.pdf

[lesnikova2015a] Tatiana Lesnikova, Jérôme David, Jérôme Euzenat,
Algorithms for cross-lingual data interlinking,
Deliverable 4.2, Lindicle, 31p., June 2015
https://exmo.inria.fr/files/reports/lindicle-42.pdf

Linked data technologies enable to publish and link structured data on the Web. Although RDF is not about text, many RDF data providers publish their data in their own language. Cross-lingual interlinking consists of discovering links between identical resources across data sets in different languages. In this report, we present a general framework for interlinking resources in different languages based on associating a specific representation to each resource and computing a similarity between these representations. We describe and evaluate three methods using this approach: the two first methods are based on gathering virtual documents and translating them and the latter one represent them as bags of identifiers from a multilingual resource (BabelNet).

[lesnikova2015b] Tatiana Lesnikova, Jérôme David, Jérôme Euzenat,
Interlinking English and Chinese RDF data using BabelNet,
Pierre Genevès, Christine Vanoirbeek (eds), Proc. 15th ACM international symposium on Document engineering (DocEng), Lausanne (CH), pp39-42, 2015
https://exmo.inria.fr/files/publications/lesnikova2015b.pdf

Linked data technologies make it possible to publish and link structured data on the Web. Although RDF is not about text, many RDF data providers publish their data in their own language. Cross-lingual interlinking aims at discovering links between identical resources across knowledge bases in different languages. In this paper, we present a method for interlinking RDF resources described in English and Chinese using the BabelNet multilingual lexicon. Resources are represented as vectors of identifiers and then similarity between these resources is computed. The method achieves an F-measure of 88%. The results are also compared to a translation-based method.

[lesnikova2016a] Tatiana Lesnikova, Jérôme David, Jérôme Euzenat,
Cross-lingual RDF thesauri interlinking,
Nicoletta Calzolari, Khalid Choukri, Thierry Declerck, Marko Grobelnik, Bente Maegaard, Joseph Mariani, Asuncion Moreno, Jan Odijk, Stelios Piperidis (eds), Proc. 10th international conference on Language resources and evaluation (LREC), Portoroz (SI), pp2442-2449, 2016
http://www.lrec-conf.org/proceedings/lrec2016/pdf/1220_Paper.pdf
https://exmo.inria.fr/files/publications/lesnikova2016a.pdf

Various lexical resources are being published in RDF. To enhance the usability of these resources, identical resources in different data sets should be linked. If lexical resources are described in different natural languages, then techniques to deal with multilinguality are required for interlinking. In this paper, we evaluate machine translation for interlinking concepts, i.e., generic entities named with a common noun or term. In our previous work, the evaluated method has been applied on named entities. We conduct two experiments involving different thesauri in different languages. The first experiment involves concepts from the TheSoz multilingual thesaurus in three languages: English, French and German. The second experiment involves concepts from the EuroVoc and AGROVOC thesauri in English and Chinese respectively. Our results demonstrate that machine translation can be beneficial for cross-lingual thesauri interlining independently of a dataset structure.

[lesnikova2016b] Tatiana Lesnikova,
RDF data interlinking: evaluation of cross-lingual methods,
Thèse d'informatique, Université de Grenoble, Grenoble (FR), May 2016
https://exmo.inria.fr/files/thesis/thesis-lesnikova.pdf

The Semantic Web extends the Web by publishing structured and interlinked data using RDF. An RDF data set is a graph where resources are nodes labelled in natural languages. One of the key challenges of linked data is to be able to discover links across RDF data sets. Given two data sets, equivalent resources should be identified and linked by owl:sameAs links. This problem is particularly difficult when resources are described in different natural languages.

This thesis investigates the effectiveness of linguistic resources for interlinking RDF data sets. For this purpose, we introduce a general framework in which each RDF resource is represented as a virtual document containing text information of neighboring nodes. The context of a resource are the labels of the neighboring nodes. Once virtual documents are created, they are projected in the same space in order to be compared. This can be achieved by using machine translation or multilingual lexical resources. Once documents are in the same space, similarity measures to find identical resources are applied. Similarity between elements of this space is taken for similarity between RDF resources. We performed evaluation of cross-lingual techniques within the proposed framework. We experimentally evaluate different methods for linking RDF data. In particular, two strategies are explored: applying machine translation or using references to multilingual resources. Overall, evaluation shows the effect of cross-lingual string-based approaches for linking RDF resources expressed in different languages. The methods have been evaluated on resources in English, Chinese, French and German. The best performance (over 0.90 F-measure) was obtained by the machine translation approach. This shows that the similarity-based method can be successfully applied on RDF resources independently of their type (named entities or thesauri concepts). The best experimental results involving just a pair of languages demonstrated the usefulness of such techniques for interlinking RDF resources cross-lingually.

[locoro2014a] Angela Locoro, Jérôme David, Jérôme Euzenat,
Context-based matching: design of a flexible framework and experiment,
Journal on data semantics 3(1):25-46, 2014
https://exmo.inria.fr/files/publications/locoro2014a.pdf

Context-based matching finds correspondences between entities from two ontologies by relating them to other resources. A general view of context-based matching is designed by analysing existing such matchers. This view is instantiated in a path-driven approach that (a) anchors the ontologies to external ontologies, (b) finds sequences of entities (path) that relate entities to match within and across these resources, and (c) uses algebras of relations for combining the relations obtained along these paths. Parameters governing such a system are identified and made explicit. They are used to conduct experiments with different parameter configurations in order to assess their influence. In particular, experiments confirm that restricting the set of ontologies reduces the time taken at the expense of recall and F-measure. Increasing path length within ontologies increases recall and F-measure as well. In addition, algebras of relations allows for a finer analysis, which shows that increasing path length provides more correct or non precise correspondences, but marginally increases incorrect correspondences.

[lopes2010a] Nuno Lopes, Axel Polleres, Alexandre Passant, Stefan Decker, Stefan Bischof, Diego Berrueta, Antonio Campos, Stéphane Corlosquet, Jérôme Euzenat, Orri Erling, Kingsley Idehen, Jacek Kopecky, Thomas Krennwallner, Davide Palmisano, Janne Saarela, Michal Zaremba,
RDF and XML: Towards a unified query layer,
Proc. W3C workshop on RDF next steps, Stanford (CA US), 2010
http://www.w3.org/2009/12/rdf-ws/papers/ws10
https://exmo.inria.fr/files/publications/lopes2010a.pdf

One of the requirements of current Semantic Web applications is to deal with heterogeneous data. The Resource Description Framework (RDF) is the W3C recommended standard for data representation, yet data represented and stored using the Extensible Markup Language (XML) is almost ubiquitous and remains the standard for data exchange. While RDF has a standard XML representation, XML Query languages are of limited use for transformations between natively stored RDF data and XML. Being able to work with both XML and RDF data using a common framework would be a great advantage and eliminate unnecessary intermediate steps that are currently used when handling both formats.

[meilicke2010a] Christian Meilicke, Cássia Trojahn dos Santos, Jérôme Euzenat,
Services for the automatic evaluation of matching tools,
Deliverable 12.2, SEALS, 35p., 2010
https://exmo.inria.fr/files/reports/seals-122.pdf

In this deliverable we describe a SEALS evaluation service for ontology matching that is based on the use of a web service interface to be implemented by the tool vendor. Following this approach we can offer an evaluation service before many components of the SEALS platform have been finished. We describe both the system architecture of the evaluation service from a general point of view as well as the specific components and their relation to the modules of the SEALS platform.

[meilicke2011a] Christian Meilicke, Cássia Trojahn dos Santos, Heiner Stuckenschmidt, Maria Ro#oiu,
Evaluation design and collection of test data for matching tools (v2),
Deliverable 12.4, SEALS, 26p., 2011
https://exmo.inria.fr/files/reports/seals-124.pdf

Based on the results of the first evaluation campaign (T12.3), and taking into account the technical progress of the

SEALS platform, we deliver an updated and extended evaluation and test data design for our second evaluation campaign. This campaign is planned to take place in the context of the OAEI at the ISWC 2011.

[meilicke2012a] Christian Meilicke, Raúl García Castro, Frederico Freitas, Willem Robert van Hage, Elena Montiel-Ponsoda, Ryan Ribeiro de Azevedo, Heiner Stuckenschmidt, Ond#ej Sváb-Zamazal, Vojtech Svátek, Andrei Tamilin, Cássia Trojahn dos Santos, Shenghui Wang,

MultiFarm: A benchmark for multilingual ontology matching,

Journal of web semantics 15(3):62-68, 2012

In this paper we present the MultiFarm dataset, which has been designed as a benchmark for multilingual ontology matching. The MultiFarm dataset is composed of a set of ontologies translated in different languages and the corresponding alignments between these ontologies. It is based on the OntoFarm dataset, which has been used successfully for several years in the Ontology Alignment Evaluation Initiative (OAEI). By translating the ontologies of the OntoFarm dataset into eight different languages -Chinese, Czech, Dutch, French, German, Portuguese, Russian, and Spanish- we created a comprehensive set of realistic test cases. Based on these test cases, it is possible to evaluate and compare the performance of matching approaches with a special focus on multilingualism.

[meilicke2012b] Christian Meilicke, José Luis Aguirre, Jérôme Euzenat, Ond#ej Sváb-Zamazal, Ernesto Jiménez-Ruiz, Ian Horrocks, Cássia Trojahn dos Santos,

Results of the second evaluation of matching tools,

Deliverable 12.6, SEALS, 30p., 2012

https://exmo.inria.fr/files/reports/seals-126.pdf

This deliverable reports on the results of the second SEALS evaluation campaign (for WP12 it is the third evaluation campaign), which has been carried out in coordination with the OAEI 2011.5 campaign. Opposed to OAEI 2010 and 2011 the full set of OAEI tracks has been executed with the help of SEALS technology. 19 systems have participated and five data sets have been used. Two of these data sets are new and have not been used in previous OAEI campaigns. In this deliverable we report on the data sets used in the campaign, the execution of the campaign, and we present and discuss the evaluation results.

[merceron2013a] Agathe Merceron, Jean-Michel Adam, Daniel Bardou, Jérôme David, Sergio Luján-Mora, Marek Milosz,

Training sessions in a Master degree 'Informatics as a Second Competence',

Proc. IEEE conference on international global engineering education coference (EDUCON), Berlin, pp190-199, 2013

https://exmo.inria.fr/files/publications/merceron2013a.pdf

The ERAMIS acronym stands for European-Russian-Central Asian Network of Master's degrees "Informatics as a Second Competence". The aim of this project is to create a Master degree "Computer Science as a Second Competence" in 9 beneficiary universities located in Kazakhstan, Kirghizstan and Russia. One crucial aspect of the project is training. In this contribution we describe how training sessions have been organized, the pedagogical issues that are involved and ways to address them.

[mochol2006a] Malgorzata Mochol, Anja Jentzsch, Jérôme Euzenat,

Applying an analytic method for matching approach selection,

Proc. 1st ISWC 2006 international workshop on ontology matching (OM), Athens (GA US), pp37-48, 2006

http://ceur-ws.org/Vol-225/paper4.pdf
https://exmo.inria.fr/files/publications/mochol2006c.pdf

One of the main open issues in the ontology matching field is the selection of a current relevant and suitable matcher. The suitability of the given approaches is determined w.r.t the requirements of the application and with careful consideration of a number of factors. This work proposes a multilevel characteristic for matching approaches, which provides a basis for the comparison of different matchers and is used in the decision making process for selection the most appropriate algorithm.

[nixon2011a] Lyndon Nixon, Raúl García Castro, Stuart Wrigley, Mikalai Yatskevich, Cássia Trojahn dos Santos, Liliana Cabral,

The state of semantic technology today: overview of the first SEALS evaluation campaigns,

Proc. 7th ACM international conference on semantic systems (I-semantics), Graz (AT), pp134-141, 2011

https://exmo.inria.fr/files/publications/nixon2011a.pdf

This paper describes the first five SEALS Evaluation Campaigns over the semantic technologies covered by the SEALS

project (ontology engineering tools, ontology reasoning tools, ontology matching tools, semantic search tools, and semantic web service tools). It presents the evaluations and test data used in these campaigns and the tools that participated in them along with a comparative analysis of their results. It also presents some lessons learnt after the execution of the evaluation campaigns and draws some final conclusions.

[petersanders2015a] Jan Peters-Anders, Mari Hukkalainen, Bruno Fies, Strahil Birov, Mathias Weise, Andrea Cavallaro, Jérôme Euzenat, Thanasis Tryferidis,

Community description,

Deliverable 1.4, Ready4SmartCities, 60p., August 2015

https://exmo.inria.fr/files/reports/r4sc-14.pdf

[pierson2009a] Jérôme Pierson,

Une infrastructure de gestion de contexte pour l'intelligence ambiante,

Thèse d'informatique, Université Joseph Fourier, Grenoble (FR), octobre 2009

https://exmo.inria.fr/files/thesis/these-pierson.pdf

Les environnements d'intelligence ambiante servent d'interface entre les services et les utilisateurs. Les applications doivent prendre en compte le contexte dans lequel les utilisateurs évoluent (le lieu, la position sociale ou hiérarchique ou l'activité par exemple) pour adapter leur comportement. Il doit exister un flux d'informations de l'environnement vers les applications. Ces applications doivent pouvoir prendre en compte dynamiquement l'arrivée de nouveaux éléments dans l'environnement (utilisateurs ou dispositifs), et les informations de contexte en provenance de l'environnement doivent pouvoir parvenir aux applications entrantes; ces flux d'informations ne peuvent pas être déterminés à l'avance et doivent se construire pendant l'exécution. Les modèles de gestion de l'information de contexte existants ne traitent pas ou peu cet aspect dynamique de l'informatique diffuse. Nous proposons d'utiliser les technologies du web sémantique pour décrire et rechercher ces informations: l'information de contexte est exprimée en RDF et décrite par des ontologies OWL. Ces technologies, parce qu'elles sont fondées sur l'hypothèse du monde ouvert, assurent l'ouverture du système et la prise en compte de dispositifs hétérogènes. Nous montrons qu'à l'aide d'un protocole simple qui permet à chacun des dispositifs et applications d'exhiber sur le réseau un modèle des informations de contexte qu'il produit ou qu'il recherche et de s'identifier, toutes les applications de l'environnement satisfont leurs besoins en informations de contexte. De surcroît, l'ouverture des langages de description d'ontologies permet l'extension des descriptions de contexte à tout moment et les technologies d'alignement d'ontologies permettent l'utilisation d'ontologies développées indépendamment. Nous avons implémenté un composant pour la gestion de l'information de contexte fondé sur ce modèle. Puis nous avons développé une architecture distribuée où les dispositifs et les applications embarquent ce composant et exposent un modèle de l'information de contexte qu'ils recherchent ou produisent. Nous avons montré comment cette architecture permet d'accepter sans interruption de nouveaux composants.

[pirro2010a] Giuseppe Pirrò, Jérôme Euzenat,

A semantic similarity framework exploiting multiple parts-of-speech,

Proc. 9th international conference on ontologies, databases, and applications of semantics (ODBASE), Heraklion (GR), (Robert Meersman, Tharam Dillon, Pilar Herrero (eds), On the move to meaningful internet systems, *Lecture notes in computer science* 6427, 2010), pp1118-1125, 2010

https://exmo.inria.fr/files/publications/pirro2010a.pdf

Semantic similarity aims at establishing resemblance by interpreting the meaning of the objects being compared. The Semantic Web can benefit from semantic similarity in several ways: ontology alignment and merging, automatic ontology construction, semantic-search, to cite a few. Current approaches mostly focus on computing similarity between nouns. The aim of this paper is to define a framework to compute semantic similarity even for other grammar categories such as verbs, adverbs and adjectives. The framework has been implemented on top of WordNet. Extensive experiments confirmed the suitability of this approach in the task of solving English tests.

[pirro2010b] Giuseppe Pirrò, Jérôme Euzenat,

A feature and information theoretic framework for semantic similarity and relatedness,

Proc. 9th conference on international semantic web conference (ISWC), Shanghai (CN), (Peter Patel-Schneider, Yue Pan, Pascal Hitzler, Peter Mika, Lei Zhang, Jeff Pan, Ian Horrocks, Birte Glimm (eds), The semantic web, *Lecture notes in computer science* 6496, 2010), pp615-630, 2010

https://exmo.inria.fr/files/publications/pirro2010b.pdf

Semantic similarity and relatedness measures between ontology concepts are useful in many research areas. While similarity only considers subsumption relations to assess how two objects are alike, relatedness takes into account a broader range of relations (e.g., part-of). In this paper, we present a framework, which maps the feature-based model of similarity into the information theoretic domain. A new way of computing IC values directly from an ontology structure is also introduced. This new model, called Extended Information Content (eIC) takes into account the whole set of

semantic relations defined in an ontology. The proposed framework enables to rewrite existing similarity measures that can be augmented to compute semantic relatedness. Upon this framework, a new measure called FaITH (Feature and Information THeoretic) has been devised. Extensive experimental evaluations confirmed the suitability of the framework.

[presutti2010a] Valentina Presutti, François Scharffe, Vojtech Svátek (eds),
(Proc. 1st EKAW workshop on Knowledge injection into and extraction from linked data (KIELD)),
73p., 2010
http://ceur-ws.org/Vol-631/

[priego2013a] Luz Maria Priego, Jérôme Euzenat, Raúl García Castro, María Poveda Villalón, Filip Radulovic, Mathias Weise,
Strategy for Energy Management System Interoperability,
Deliverable 2.1, Ready4SmartCities, 25p., December 2013
https://exmo.inria.fr/files/reports/r4sc-21.pdf

The goal of the Ready4SmartCities project is to support energy data interoperability in the context of SmartCities. It keeps a precise focus on building and urban data. Work package 2 is more specifically concerned with identifying the knowledge and data resources available or needed, that support energy management system interoperability. This deliverable defines the strategy to be used in WP2 for achieving its goal. It is made of two parts: identifying domains and stakeholders specific to the WP2 activity and the methodology used in WP2 and WP3.

[rosoiu2011a] Maria Ro#oiu, Cássia Trojahn dos Santos, Jérôme Euzenat,
Ontology matching benchmarks: generation and evaluation,
Pavel Shvaiko, Isabel Cruz, Jérôme Euzenat, Tom Heath, Ming Mao, Christoph Quix (eds), Proc. 6th ISWC workshop on ontology matching (OM), Bonn (DE), pp73-84, 2011
http://ceur-ws.org/Vol-814/om2011_Tpaper7.pdf
https://exmo.inria.fr/files/publications/rosoiu2011a.pdf

The OAEI Benchmark data set has been used as a main reference to evaluate and compare matching systems. It requires matching an ontology with systematically modified versions of itself. However, it has two main drawbacks: it has not varied since 2004 and it has become a relatively easy task for matchers. In this paper, we present the design of a modular test generator that overcomes these drawbacks. Using this generator, we have reproduced Benchmark both with the original seed ontology and with other ontologies. Evaluating different matchers on these generated tests, we have observed that (a) the difficulties encountered by a matcher at a test are preserved across the seed ontology, (b) contrary to our expectations, we found no systematic positive bias towards the original data set which has been available for developers to test their systems, and (c) the generated data sets have consistent results across matchers and across seed ontologies. However, the discriminant power of the generated tests is still too low and more tests would be necessary to draw definitive conclusions.

[rosoiu2015a] Maria Ro#oiu, Jérôme David, Jérôme Euzenat,
A linked data framework for Android,
In: Elena Simperl, Barry Norton, Dunja Mladenic, Emanuele Della Valle, Irini Fundulaki, Alexandre Passant, Raphaël Troncy (eds), The Semantic Web: ESWC 2012 Satellite Events, Springer Verlag, Heidelberg (DE), 2015, pp204-218
https://exmo.inria.fr/files/publications/rosoiu2012a.pdf

Mobile devices are becoming major repositories of personal information. Still, they do not provide a uniform manner to deal with data from both inside and outside the device. Linked data provides a uniform interface to access structured interconnected data over the web. Hence, exposing mobile phone information as linked data would improve the usability of such information. We present an API that provides data access in RDF, both within mobile devices and from the outside world. This API is based on the Android content provider API which is designed to share data across Android applications. Moreover, it introduces a transparent URI dereferencing scheme, exposing content outside of the device. As a consequence, any application may access data as linked data without any a priori knowledge of the data source.

[roussey2010a] Catherine Roussey, François Scharffe, Óscar Corcho, Ond#ej Zamazal,
Une méthode de débogage d'ontologies OWL basée sur la détection d'anti-patrons,
Actes 21e journées francophones sur Ingénierie des connaissances (IC), Nîmes (FR), pp43-54, 2010
http://hal.archives-ouvertes.fr/docs/00/48/99/12/PDF/IC2010-OntologyDebugging_HAL.pdf

https://exmo.inria.fr/files/publications/roussey2010a.pdf

Le débogage d'ontologies OWL incohérentes est une tâche fastidieuse et consommatrice de temps où une collaboration entre cogniticiens et experts du domaine est nécessaire pour comprendre si les corrections à effectués portent sur la formalisation (erreur syntaxique) ou sur la conceptualisation initiale (erreur de sens). Les outils et les méthodologies actuels de conception d'ontologies proposent des services de débogage pour aider à la réalisation de cette tâche. Cependant, dans des cas complexes, ces services sont loin de fournir l'assistance adéquate aux concepteurs d'ontologie: manque d'efficacité, manque d'explications sur les causes de l'insatisfiabilité d'une classe, manque de proposition de correction. Nous prétendons qu'il est possible de fournir une assistance supplémentaire aux concepteurs en utilisant une stratégie de débogage basée sur l'identification d'anti-patrons. Cette stratégie peut être associée à des outils existants pour faciliter le débogage.

[sanchez2016a] Adam Sanchez, Tatiana Lesnikova, Jérôme David, Jérôme Euzenat,
Instance-level matching,
Deliverable 3.2, Lindicle, 20p., September 2016
https://exmo.inria.fr/files/reports/lindicle-32.pdf

This paper describes precisely an ontology matching technique based on the extensional definition of a class as set of instances. It first provides a general characterisation of such techniques and, in particular the need to rely on links across data sets in order to compare instances. We then detail the implication intensity measure that has been chosen. The resulting algorithm is implemented and evaluated on XLore, DBPedia, LinkedGeoData and Geospecies.

[scharffe2007a] François Scharffe, Jérôme Euzenat, Ying Ding, Dieter Fensel,
Correspondence patterns for ontology mediation,
Proc. ISWC poster session , Busan (KR), pp89-90, 2007

[scharffe2007b] François Scharffe, Jérôme Euzenat, Chan Le Duc, Pavel Shvaiko,
Analysis of knowledge transformation and merging techniques and implementations,
Deliverable 2.2.7, Knowledge web, 50p., December 2007
https://exmo.inria.fr/files/reports/kweb-227.pdf

Dealing with heterogeneity requires finding correspondences between ontologies and using these correspondences for performing some action such as merging ontologies, transforming ontologies, translating data, mediating queries and reasoning with aligned ontologies. This deliverable considers this problem through the introduction of an alignment life cycle which also identifies the need for manipulating, storing and sharing the alignments before processing them. In particular, we also consider support for run time and design time alignment processing.

[scharffe2008a] François Scharffe, Jérôme Euzenat, Dieter Fensel,
Towards design patterns for ontology alignment,
Proc. 24th ACM symposium on applied computing (SAC), Fortaleza (BR), pp2321-2325, 2008
https://exmo.inria.fr/files/publications/scharffe2008a.pdf

Aligning ontologies is a crucial and tedious task. Matching algorithms and tools provide support to facilitate the task of the user in defining correspondences between ontologies entities. However, automatic matching is actually limited to the detection of simple one to one correspondences to be further refined by the user. We introduce in this paper Correspondence Patterns as a tool to assist the design of ontology alignments. Based on existing research on patterns in the fields of software and ontology engineering, we define a pattern template and use it to develop a correspondence patterns library. This library is published in RDF following the Alignment Ontology vocabulary.

[scharffe2009b] Ond#ej Sváb-Zamazal, François Scharffe, Vojtech Svátek,
Preliminary results of logical ontology pattern detection using SPARQL and lexical heuristics,
Proc. 1st ISWC workshop on Ontology pattern (WOP), Chantilly (VA US), pp139-146, 2009
http://ceur-ws.org/Vol-516/pap06.pdf

[scharffe2010a] François Scharffe, Jérôme Euzenat,
Méthodes et outils pour lier le web des données,
Actes 17e conférence AFIA-AFRIF sur reconnaissance des formes et intelligence artificielle (RFIA), Caen (FR), pp678-685, 2010
https://exmo.inria.fr/files/publications/scharffe2010a.pdf

Le web des données consiste à publier des données sur le web de telle sorte qu'elles puissent être interprétées et connectées entre elles. Il est donc vital d'établir les liens entre ces données à la fois pour le web des données et pour le web sémantique qu'il contribue à nourrir. Nous proposons un cadre général dans lequel s'inscrivent les différentes

techniques utilisées pour établir ces liens et nous montrons comment elles s'y insèrent. Nous proposons ensuite une architecture permettant d'associer les différents systèmes de liage de données et de les faire collaborer avec les systèmes développés pour la mise en correspondance d'ontologies qui présente de nombreux points communs avec la découverte de liens.

[scharffe2011a] François Scharffe, Jérôme Euzenat,
MeLinDa: an interlinking framework for the web of data,
Research report 7641, INRIA, Grenoble (FR), 21p., July 2011
http://hal.inria.fr/inria-00610160
https://exmo.inria.fr/files/reports/rr-inria-7691.pdf
http://arxiv.org/abs/1107.4502

The web of data consists of data published on the web in such a way that they can be interpreted and connected together. It is thus critical to establish links between these data, both for the web of data and for the semantic web that it contributes to feed. We consider here the various techniques developed for that purpose and analyze their commonalities and differences. We propose a general framework and show how the diverse techniques fit in the framework. From this framework we consider the relation between data interlinking and ontology matching. Although, they can be considered similar at a certain level (they both relate formal entities), they serve different purposes, but would find a mutual benefit at collaborating. We thus present a scheme under which it is possible for data linking tools to take advantage of ontology alignments.

[scharffe2011b] François Scharffe, Jérôme Euzenat,
Linked data meets ontology matching: enhancing data linking through ontology alignments,
Proc. 3rd international conference on Knowledge engineering and ontology development (KEOD), Paris (FR), pp279-284, 2011
https://exmo.inria.fr/files/publications/scharffe2011b.pdf

The Web of data consists of publishing data on the Web in such a way that they can be connected together and interpreted. It is thus critical to establish links between these data, both for the Web of data and for the Semantic Web that it contributes to feed. We consider here the various techniques which have been developed for that purpose and analyze their commonalities and differences. This provides a general framework that the diverse data linking systems instantiate. From this framework we consider the relation between data linking and ontology matching activities. Although, they can be considered similar at a certain level (they both relate formal entities), they serve different purposes: one acts at the schema level and the other at the instance level. However, they would find a mutual benefit at collaborating. We thus present a scheme under which it is possible for data linking tools to take advantage of ontology alignments. We present the features of expressive alignment languages that allows linking specifications to reuse ontology alignments in a natural way.

[scharffe2011c] François Scharffe, Zhengjie Fan, Alfio Ferrara, Houda Khrouf, Andriy Nikolov,
Methods for automated dataset interlinking,
Deliverable 4.1, Datalift, 34p., 2011
https://exmo.inria.fr/files/reports/datalift-411.pdf

Interlinking data is a crucial step in the Datalift platform framework. It ensures that the published datasets are connected with others on the Web. Many techniques are developed on this topic in order to automate the task of finding similar entities in two datasets. In this deliverable, we first clarify terminology in the field of linking data. Then we classify and overview many techniques used to automate data linking on the web. We finally review 11 state-of-the-art tools and classify them according to which technique they use.

[scharffe2012a] François Scharffe, Ghislain Atemezing, Raphaël Troncy, Fabien Gandon, Serena Villata, Bénédicte Bucher, Fayçal Hamdi, Laurent Bihanic, Gabriel Képéklian, Franck Cotton, Jérôme Euzenat, Zhengjie Fan, Pierre-Yves Vandenbussche, Bernard Vatant,
Enabling linked data publication with the Datalift platform,
Proc. AAAI workshop on semantic cities, Toronto (ONT CA), 2012
https://exmo.inria.fr/files/publications/scharffe2012a.pdf
http://www.aaai.org/ocs/index.php/WS/AAAIW12/paper/view/5349

As many cities around the world provide access to raw public data along the Open Data movement, many questions arise concerning the accessibility of these data. Various data formats, duplicate identifiers, heterogeneous metadata schema descriptions, and diverse means to access or query the data exist. These factors make it difficult for consumers to reuse and integrate data sources to develop innovative applications. The Semantic Web provides a global solution to these problems by providing languages and protocols for describing and accessing datasets. This paper presents Datalift, a framework and a platform helping to lift raw data sources to semantic interlinked data sources.

[scharffe2012b] François Scharffe, Jérôme David, Manuel Atencia,
Keys and pseudo-keys detection for web datasets cleansing and interlinking,
Deliverable 4.1.2, Datalift, 18p., 2012
https://exmo.inria.fr/files/reports/datalift-412.pdf

This report introduces a novel method for analysing web datasets based on key dependencies. This particular kind of functional dependencies, widely studied in the field of database theory, allows to evaluate if a set of properties constitutes a key for the set of data considered. When this is the case, there won't be any two instances having identical values for these properties. After giving necessary definitions, we propose an algorithm for detecting minimal keys and pseudo-keys in a RDF dataset. We then use this algorithm to detect keys in datasets published as web data and we apply this approach in two applications: (i) reducing the number of properties to compare in order to discover equivalent instances between two datasets, (ii) detecting errors inside a dataset.

[sepponen2014a] Mari Sepponen, Matti Hannus, Kalevi Piira, Andrea Cavallaro, Raúl García Castro, Bruno Fies, Thanasis Tryferidis, Kleopatra Zoi Tsagkari, Jérôme Euzenat, Florian Judex, Daniele Basciotti, Charlotte Marguerite, Ralf-Roman Schmidt, Strahil Birov, Simon Robinson, Georg Vogt,
Draft of innovation and research roadmap,
Deliverable 5.3, Ready4SmartCities, 47p., November 2014
https://exmo.inria.fr/files/reports/r4sc-53.pdf

[sharma2006a] Arun Sharma,
Lightweight synchronization of ontologies,
Master's thesis, RWTH, Aachen (DE), 2006
https://exmo.inria.fr/files/reports/diplom-sharma.pdf

The semantic web is based on the idea of having formalized knowledge expressed on the web (in languages like RDF). However, we know that people do not like to strictly comply with some ontology and they would tend to add their own tags within existing ontology descriptions. This thesis addresses the issue of heterogeneity within the domain of photo annotation. It presents a peer-to-peer infrastructure and client software that enables users to provide ontology based photo annotations in a free manner (by using the most convenient vocabulary) and share them with other users in a peer-to-peer environment. Moreover, the thesis presents an ontology alignment based mediator service to translate queries among the peers.

[shvaiko2005a] Pavel Shvaiko, Jérôme Euzenat,
A survey of schema-based matching approaches,
Journal on data semantics 4:146-171, 2005
https://exmo.inria.fr/files/publications/shvaiko2005a.pdf

Schema and ontology matching is a critical problem in many application domains, such as semantic web, schema/ontology integration, data warehouses, e-commerce, etc. Many different matching solutions have been proposed so far. In this paper we present a new classification of schema-based matching techniques that builds on the top of state of the art in both schema and ontology matching. Some innovations are in introducing new criteria which are based on (i) general properties of matching techniques, (ii) interpretation of input information, and (iii) the kind of input information. In particular, we distinguish between approximate and exact techniques at schema-level; and syntactic, semantic, and external techniques at element- and structure-level. Based on the classification proposed we overview some of the recent schema/ontology matching systems pointing which part of the solution space they cover. The proposed classification provides a common conceptual basis, and, hence, can be used for comparing different existing schema/ontology matching techniques and systems as well as for designing new ones, taking advantages of state of the art solutions.

[shvaiko2005c] Pavel Shvaiko, Jérôme Euzenat,
Ontology Matching,
DLib magazine 12(11), 2005
D-Lib magazine 11(12)
http://www.dlib.org/dlib/december05/12inbrief.html#PAVEL

[shvaiko2005b] Pavel Shvaiko, Jérôme Euzenat, Alain Léger, Deborah McGuinness, Holger Wache (eds),
Context and ontologies: theory and practice (Proc. AAAI workshop on Context and ontologies: theory and practice),
143p., 2005

http://www.c-and-o.net
https://exmo.inria.fr/files/reports/AAAI2005-cando-ws.pdf

[shvaiko2006a] Pavel Shvaiko, Jérôme Euzenat, Alain Léger, Deborah McGuinness, Holger Wache (eds),
Context and ontologies: theory and practice (Proc. ECAI workshop on Context and ontologies: theory and practice),
88p., 2006
http://ceur-ws.org/Vol-210/
http://www.c-and-o.net
https://exmo.inria.fr/files/reports/ECAI2006-cando-ws.pdf

[shvaiko2006b] Pavel Shvaiko, Jérôme Euzenat, Natalya Noy, Heiner Stuckenschmidt, Richard Benjamins, Michael Uschold (eds),
(Proc. 1st ISWC 2006 international workshop on ontology matching (OM)),
245p., 2006
http://ceur-ws.org/Vol-225/
https://exmo.inria.fr/files/reports/ISWC2006-OM-ws.pdf

[shvaiko2007a] Pavel Shvaiko, Jérôme Euzenat, Heiner Stuckenschmidt, Malgorzata Mochol, Fausto Giunchiglia, Mikalai Yatskevich, Paolo Avesani, Willem Robert van Hage, Ond#ej Sváb, Vojtech Svátek,
Description of alignment evaluation and benchmarking results,
Deliverable 2.2.9, Knowledge web, 69p., 2007
https://exmo.inria.fr/files/reports/kweb-229.pdf

[shvaiko2007b] Pavel Shvaiko, Jérôme Euzenat (eds),
Special issue on Ontology matching,
International journal of semantic web and information systems (special issue) 3(2):1-122, 2007

[shvaiko2007c] Pavel Shvaiko, Jérôme Euzenat,
Guest editorial preface of the special issue on Ontology matching,
International journal of semantic web and information systems 3(2):i-iii, 2007
https://www.igi-global.com/Files/Ancillary/IJSWIS%20preface%203(2).pdf
https://exmo.inria.fr/files/publications/shvaiko2007c.pdf

[shvaiko2007d] Pavel Shvaiko, Jérôme Euzenat, Fausto Giunchiglia, Bin He (eds),
(Proc. 2nd ISWC 2007 international workshop on ontology matching (OM)),
308p., 2007
http://ceur-ws.org/Vol-304/
https://exmo.inria.fr/files/reports/ISWC2007-OM-ws.pdf

[shvaiko2008a] Pavel Shvaiko, Jérôme Euzenat,
Ten challenges for ontology matching,
Proc. 7th international conference on ontologies, databases, and applications of semantics (ODBASE), Monterey (MX), (Robert Meersman, Zahir Tari (eds), On the Move to Meaningful Internet Systems: OTM 2008, *Lecture notes in computer science* 5332, 2008), pp1163-1181, 2008
https://exmo.inria.fr/files/publications/shvaiko2008a.pdf

This paper aims at analyzing the key trends and challenges of the ontology matching field. The main motivation behind this work is the fact that despite many component matching solutions that have been developed so far, there is no integrated solution that is a clear success, which is robust enough to be the basis for future development, and which is usable by non expert users. In this paper we first provide the basics of ontology matching with the help of examples. Then, we present general trends of the field and discuss ten challenges for ontology matching, thereby aiming to direct research into the critical path and to facilitate progress of the field.

[shvaiko2008b] Pavel Shvaiko, Jérôme Euzenat, Fausto Giunchiglia, Heiner Stuckenschmidt (eds),
(Proc. 3rd ISWC international workshop on ontology matching (OM)),
258p., 2008

http://ceur-ws.org/Vol-431/
https://exmo.inria.fr/files/reports/ISWC2008-OM-ws.pdf

[shvaiko2009a] Pavel Shvaiko, Jérôme Euzenat, Fausto Giunchiglia, Heiner Stuckenschmidt, Natalya Noy, Arnon Rosenthal (eds),
(Proc. 4th ISWC workshop on ontology matching (OM)),
271p., 2009
http://ceur-ws.org/Vol-551/
https://exmo.inria.fr/files/reports/ISWC2009-OM-ws.pdf

[shvaiko2010a] Pavel Shvaiko, Jérôme Euzenat, Fausto Giunchiglia, Heiner Stuckenschmidt, Ming Mao, Isabel Cruz (eds),
(Proc. 5th ISWC workshop on ontology matching (OM)),
255p., 2010
http://ceur-ws.org/Vol-689/
https://exmo.inria.fr/files/reports/ISWC2010-OM-ws.pdf

[shvaiko2011a] Pavel Shvaiko, Isabel Cruz, Jérôme Euzenat, Tom Heath, Ming Mao, Christoph Quix (eds),
(Proc. 6th ISWC workshop on ontology matching (OM)),
264p., 2011
http://ceur-ws.org/Vol-814/
https://exmo.inria.fr/files/reports/ISWC2011-OM-ws.pdf

[shvaiko2012a] Pavel Shvaiko, Jérôme Euzenat, Anastasios Kementsietsidis, Ming Mao, Natalya Noy, Heiner Stuckenschmidt (eds),
(Proc. 7th ISWC workshop on ontology matching (OM)),
253p., 2012
http://ceur-ws.org/Vol-946/
https://exmo.inria.fr/files/reports/ISWC2012-OM-ws.pdf

[shvaiko2013a] Pavel Shvaiko, Jérôme Euzenat,
Ontology matching: state of the art and future challenges,
IEEE Transactions on knowledge and data engineering 25(1):158-176, 2013
https://exmo.inria.fr/files/publications/shvaiko2013a.pdf

After years of research on ontology matching, it is reasonable to consider several questions: is the field of ontology matching still making progress? Is this progress significant enough to pursue some further research? If so, what are the particularly promising directions? To answer these questions, we review the state of the art of ontology matching and analyze the results of recent ontology matching evaluations. These results show a measurable improvement in the field, the speed of which is albeit slowing down. We conjecture that significant improvements can be obtained only by addressing important challenges for ontology matching. We present such challenges with insights on how to approach them, thereby aiming to direct research into the most promising tracks and to facilitate the progress of the field.

[shvaiko2013b] Pavel Shvaiko, Jérôme Euzenat, Kavitha Srinivas, Ming Mao, Ernesto Jiménez-Ruiz (eds),
(Proc. 8th ISWC workshop on ontology matching (OM)),
249p., 2013
http://ceur-ws.org/Vol-1111/
https://exmo.inria.fr/files/reports/ISWC2013-OM-ws.pdf

[shvaiko2014a] Pavel Shvaiko, Jérôme Euzenat, Ming Mao, Ernesto Jiménez-Ruiz, Juanzi Li, Axel-Cyrille Ngonga Ngomo (eds),
(Proc. 9th ISWC workshop on ontology matching (OM)),
187p., 2014
http://ceur-ws.org/Vol-1317/
https://exmo.inria.fr/files/reports/ISWC2014-OM-ws.pdf

[shvaiko2016a] Pavel Shvaiko, Jérôme Euzenat, Ernesto Jiménez-Ruiz, Michelle Cheatham, Oktie

Hassanzadeh (eds),
(Proc. 10th ISWC workshop on ontology matching (OM)),
239p., 2016
http://ceur-ws.org/Vol-1545/
https://exmo.inria.fr/files/reports/ISWC2015-OM-ws.pdf

[shvaiko2016b] Pavel Shvaiko, Jérôme Euzenat, Ernesto Jiménez-Ruiz, Michelle Cheatham, Oktie Hassanzadeh, Ryutaro Ichise (eds),
(Proc. 11th ISWC workshop on ontology matching (OM)),
252p., 2016
http://ceur-ws.org/Vol-1766/
https://exmo.inria.fr/files/reports/ISWC2016-OM-ws.pdf

[siberski2004a] Wolf Siberski, Maud Cahuzac, Maria Del Carmen Suárez Figueroa, Rafael Gonzales Cabrero, Jérôme Euzenat, Shishir Garg, Jens Hartmann, Alain Léger, Diana Maynard, Jeff Pan, Pavel Shvaiko, Farouk Toumani,
Software framework requirements analysis,
Deliverable 1.2.2, Knowledge web, 59p., December 2004
http://knowledgeweb.semanticweb.org/semanticportal/servlet/download?ontology=Documentation+
https://exmo.inria.fr/files/reports/kweb-122.pdf

[stuckenschmidt2001a] Heiner Stuckenschmidt, Jérôme Euzenat,
Ontology Language Integration: A Constructive Approach,
Proc. KI workshop on Applications of Description Logics, Wien (AT), 2001
http://ceur-ws.org/Vol-44/StuckenschmidtEuzenat.ps.gz
https://exmo.inria.fr/files/publications/stuckenschmidt2001a.pdf

The problem of integrating different ontology languages has become of special interest recently, especially in the context of semantic web applications. In the paper, we present an approach that is based on the configuration of a joint language all other languages can be translated into. We use description logics as a basis for constructing this common language taking advantage of the modular character and the availability of profound theoretical results in this area. We give the central definitions and exemplify the approach using example ontologies available on the Web.

[stuckenschmidt2005a] Heiner Stuckenschmidt, Marc Ehrig, Jérôme Euzenat, Andreas Hess, Willem Robert van Hage, Wei Hu, Ningsheng Jian, Gong Chen, Yuzhong Qu, George Stoilos, Giorgos Stamou, Umberto Straccia, Vojtech Svátek, Raphaël Troncy, Petko Valtchev, Mikalai Yatskevich,
Description of alignment implementation and benchmarking results,
Deliverable 2.2.4, Knowledge web, 87p., December 2005
https://exmo.inria.fr/files/reports/kweb-224.pdf

This deliverable presents the evaluation campaign carried out in 2005 and the improvement participants to these campaign and others have to their systems. We draw lessons from this work and proposes improvements for future campaigns.

[sure2004a] York Sure, Óscar Corcho, Jérôme Euzenat, Todd Hughes (eds),
Evaluation of Ontology-based tools (Proc. 3rd ISWC2004 workshop on Evaluation of Ontology-based tools (EON)),
97p., 2004
http://ceur-ws.org/Vol-128/
https://exmo.inria.fr/files/reports/ISWC2004-EON-ws.pdf

[trojahn2009a] Cássia Trojahn dos Santos, Jérôme Euzenat, Christian Meilicke, Heiner Stuckenschmidt,
Evaluation design and collection of test data for matching tools,
Deliverable 12.1, SEALS, 68p., November 2009
https://exmo.inria.fr/files/reports/seals-121.pdf

This deliverable presents a systematic procedure for evaluating ontology matching systems and algorithms, in the context of SEALS project. It describes the criteria and metrics on which the evaluations will be carried out and the

characteristics of the test data to be used, as well as the evaluation target, which includes the systems generating the alignments for evaluation.

[trojahn2010a] Cássia Trojahn dos Santos, Paulo Quaresma, Renata Vieira,
An API for multilingual ontology matching,
Nicoletta Calzolari, Khalid Choukri, Bente Maegaard, Joseph Mariani, Jan Odjik, Stelios Piperidis, Mike Rosner, Daniel Tapias (eds), Proc. 7th conference on Language Resources and Evaluation Conference (LREC), Valletta (MT), pp3830-3835, 2010
http://www.lrec-conf.org/proceedings/lrec2010/pdf/691_Paper.pdf
https://exmo.inria.fr/files/publications/trojahn2010a.pdf

Ontology matching consists of generating a set of correspondences between the entities of two ontologies. This process is seen as a solution to data heterogeneity in ontology-based applications, enabling the interoperability between them. However, existing matching systems are designed by assuming that the entities of both source and target ontologies are written in the same languages (English, for instance). Multi-lingual ontology matching is an open research issue. This paper describes an API for multi-lingual matching that implements two strategies, direct translation-based and indirect. The first strategy considers direct matching between two ontologies (i.e., without intermediary ontologies), with the help of external resources, i.e., translations. The indirect alignment strategy, proposed by (Jung et al., 2009), is based on composition of alignments. We evaluate these strategies using simple string similarity based matchers and three ontologies written in English, French, and Portuguese, an extension of the OAEI benchmark test 206.

[trojahn2010b] Cássia Trojahn dos Santos, Jérôme Euzenat,
Consistency-driven argumentation for alignment agreement,
Pavel Shvaiko, Jérôme Euzenat, Fausto Giunchiglia, Heiner Stuckenschmidt, Ming Mao, Isabel Cruz (eds), Proc. 5th ISWC workshop on ontology matching (OM), Shanghai (CN), pp37-48, 2010
http://ceur-ws.org/Vol-689/om2010_Tpaper4.pdf
https://exmo.inria.fr/files/publications/trojahn2010b.pdf

Ontology alignment agreement aims at overcoming the problem that arises when different parties need to conciliate their conflicting views on ontology alignments. Argumentation has been applied as a way for supporting the creation and exchange of arguments, followed by the reasoning on their acceptability. Here we use arguments as positions that support or reject correspondences. Applying only argumentation to select correspondences may lead to alignments which relates ontologies in an inconsistent way. In order to address this problem, we define maximal consistent sub-consolidations which generate consistent and argumentation-grounded alignments. We propose a strategy for computing them involving both argumentation and logical inconsistency detection. It removes correspondences that introduce inconsistencies into the resulting alignment and allows for maintaining the consistency within an argumentation system. We present experiments comparing the different approaches. The (partial) experiments suggest that applying consistency checking and argumentation independently significantly improves results, while using them together does not bring so much. The features of consistency checking and argumentation leading to this result are analysed.

[trojahn2010c] Cássia Trojahn dos Santos, Christian Meilicke, Jérôme Euzenat, Heiner Stuckenschmidt,
Automating OAEI Campaigns (First Report),
Asunción Gómez Pérez, Fabio Ciravegna, Frank van Harmelen, Jeff Heflin (eds), Proc. 1st ISWC international workshop on evaluation of semantic technologies (iWEST), Shanghai (CN), 2010
http://ceur-ws.org/Vol-666/paper13.pdf
https://exmo.inria.fr/files/publications/trojahn2010c.pdf

This paper reports the first effort into integrating OAEI and SEALS evaluation campaigns. The SEALS project aims at providing standardized resources (software components, data sets, etc.) for automatically executing evaluations of typical semantic web tools, including ontology matching tools. A first version of the software infrastructure is based on the use of a web service interface wrapping the functionality of a matching tool to be evaluated. In this setting, the evaluation results can visualized and manipulated immediately in a direct feedback cycle. We describe how parts of the OAEI 2010 evaluation campaign have been integrated into this software infrastructure. In particular, we discuss technical and organizational aspects related to the use of the new technology for both participants and organizers of the OAEI.

[trojahn2010d] Cássia Trojahn dos Santos, Christian Meilicke, Jérôme Euzenat, Ond#ej Sváb-Zamazal,
Results of the first evaluation of matching tools,
Deliverable 12.3, SEALS, 36p., November 2010
https://exmo.inria.fr/files/reports/seals-123.pdf

This deliverable reports the results of the first SEALS evaluation campaign, which has been carried out in coordination

with the OAEI 2010 campaign. A subset of the OAEI tracks has been included in a new modality, the SEALS modality. From the participant's point of view, the main innovation is the use of a web-based interface for launching evaluations. 13 systems, out of 15 for all tracks, have participated in some of the three SEALS tracks. We report the preliminary results of these systems for each SEALS track and discuss the main lesson learned from to the use of the new technology for both participants and organizers of the OAEI.

[trojahn2011a] Cássia Trojahn dos Santos, Jérôme Euzenat, Valentina Tamma, Terry Payne,
Argumentation for reconciling agent ontologies,
In: Atilla Elçi, Mamadou Koné, Mehmet Orgun (eds), Semantic Agent Systems, Springer, New-York (NY US), 2011, pp89-111
https://exmo.inria.fr/files/publications/trojahn2011a.pdf

Within open, distributed and dynamic environments, agents frequently encounter and communicate with new agents and services that were previously unknown. However, to overcome the ontological heterogeneity which may exist within such environments, agents first need to reach agreement over the vocabulary and underlying conceptualisation of the shared domain, that will be used to support their subsequent communication. Whilst there are many existing mechanisms for matching the agents' individual ontologies, some are better suited to certain ontologies or tasks than others, and many are unsuited for use in a real-time, autonomous environment. Agents have to agree on which correspondences between their ontologies are mutually acceptable by both agents. As the rationale behind the preferences of each agent may well be private, one cannot always expect agents to disclose their strategy or rationale for communicating. This prevents the use of a centralised mediator or facilitator which could reconcile the ontological differences. The use of argumentation allows two agents to iteratively explore candidate correspondences within a matching process, through a series of proposals and counter proposals, i.e., arguments. Thus, two agents can reason over the acceptability of these correspondences without explicitly disclosing the rationale for preferring one type of correspondences over another. In this chapter we present an overview of the approaches for alignment agreement based on argumentation.

[trojahn2011b] Cássia Trojahn dos Santos, Christian Meilicke, Jérôme Euzenat,
Iterative implementation of services for the automatic evaluation of matching tools,
Deliverable 12.5, SEALS, 21p., 2011
https://exmo.inria.fr/files/reports/seals-125.pdf

The implementation of the automatic services for evaluating matching tools follows an iterative model. The aim is to provide a way for continuously analysing and improving these services. In this deliverable, we report the first iteration of this process, i.e., current implementation status of the services. In this first iteration, we have extended our previous implementation in order to migrate our own services to the SEALS components, which have been finished since the end of the first evaluation campaign.

[troncy2000a] Raphaël Troncy,
Intégration texte-représentation formelle pour la gestion de documents XML,
DEA d'informatique, Université Joseph Fourier-INPG, Grenoble (FR), 2000
https://exmo.inria.fr/files/reports/dea-troncy.pdf
https://exmo.inria.fr/files/reports/dea-troncy.ps.gz

Actuellement, le Web contient d'importantes quantités d'informations couvrant tous les sujets imaginables. Le problème qui était avant de savoir si une information, même très spécifique, était disponible sur le Web, est mainte nant devenu comment retrouver cette information. Apporter du sens intelligible et exploitable par des machines aux documents devrait leur permettre d'utiliser l'information présente, d'améliorer les techniques de recherche, et donc de faire du Web une gigantesque base de connaissance. Les langages de représentation de connaissance sont de bons candidats si l'on souhaite décrire le contenu de documents. L'action Escrire a d'ailleurs pour objectif d'en comparer trois. Parmi eux, la représentation de connaissances à objets apparaît particulièrement adaptée lorsqu'il s'agit de représenter des connaissances complexes sur un domaine en cours d'étude. On pourra alors manipuler plus efficacement une base de documents en les indexant par leur contenu (ou leur sens). Les documents pertinents seront ramenés à partir de requêtes structurées tirant parti du formalisme de représentation de connaissance (hiérarchie de classes, mécanismes de classification...). Nous avons d'abord observé le lien étroit existant entre la nature de la connaissance à représenter et le type du document. Nous avons aussi pu voir que plus que le contenu, c'est l'application résultante qui va décider des éléments à représenter. Nous avons donc essayé d'imaginer quels types de requêtes un utilisateur est susceptible de poser, ce qui nous a conduit à proposer un langage de requêtes. Un corpus de travail a été utilisé pour mettre en oeuvre les choix effectués. Il concerne les interactions géniques chez la drosophile pendant son processus de segmentation. Le système de représentation de connaissances à objets Troeps gère les connaissances contenues dans les documents. Un évaluateur de requêtes a été intégré à ce système pour permettre de l'interroger.

[troncy2004a] Raphaël Troncy,

Formalisation des connaissances documentaires et des connaissances conceptuelles à l'aide d'ontologies : application à la description de documents audiovisuels,
Thèse d'informatique, Université Joseph Fourier, Grenoble (FR), mars 2004
https://exmo.inria.fr/files/thesis/these-troncy.pdf

La manipulation de contenus audiovisuels est une tâche à la fois complexe et spécifique, qui nécessite le plus souvent de recourir à des représentations médiatrices. La nature temporelle de l'audiovisuel impose de passer par le biais de la description pour enrichir les documents et donc les exploiter. La numérisation des documents audiovisuels permet d'envisager de nouvelles exploitations des contenus telles que leur recherche "intelligente", leur recomposition dynamique ou la personnalisation de leur accès. Le système technique qui rend ces services doit alors être intégré et faire le lien entre le contenu et sa description. Nous soutenons qu'une représentation de la structure et du contenu des documents est nécessaire. Par structure, nous entendons la structure documentaire c'est-à-dire l'organisation méréologique des éléments qui composent le document, tandis que le contenu est une structure conceptuelle, c'est-à-dire une catégorisation de ces éléments. Cette double représentation fait ressortir le besoin d'un format de description homogène et exploitable par la machine, à la fois expressif et optimal en terme de manipulations. Après une revue des propositions actuelles de modélisation des documents audiovisuels, issues de l'ingénierie documentaire et de l'ingénierie des connaissances, nous montrons qu'aucun des langages étudiés ne permet de traiter ces deux aspects de manière satisfaisante. Nous proposons alors une architecture générale permettant la représentation formelle de la structure et du contenu des documents audiovisuels, qui engendrera une base de connaissances sur laquelle il est possible d'effectuer des raisonnements. Cette architecture se compose d'une ontologie de l'audiovisuel, dont on traduit une partie dans un langage documentaire pour contrôler la structure logique des documents, et d'une ontologie de domaine pour décrire formellement leur contenu. Deux ontologies ont donc été modélisées: l'ontologie générique de l'audiovisuel et une ontologie du cyclisme qui est le domaine d'application de notre architecture. Nous avons développé pour cela l'outil DOE (Differential Ontology Editor), qui implémente la méthodologie de construction d'ontologies utilisée. Nous montrons finalement la pertinence de l'approche à l'aide de deux expérimentations utilisant un corpus de vidéos annoté et pour lesquelles une implémentation de la base de connaissances est proposée, illustrant ainsi les types d'inférences possibles.

[troncy2000b] Raphaël Troncy,
Intégration texte-représentation formelle pour la gestion de documents XML,
Magistère d'informatique, Université Joseph Fourier-INPG, Grenoble (FR), 2000
https://exmo.inria.fr/files/reports/troncy2000b.ps.gz

[troncy2002a] Raphaël Troncy, Antoine Isaac,
DOE : une mise en oeuvre d'une méthode de structuration différentielle pour les ontologies,
Actes 13e journées francophones sur Ingénierie des Connaissances (IC), Rouen (FR), pp63-74, 2002
https://exmo.inria.fr/files/publications/troncy2002a.pdf

L'INA s'intéresse aux ontologies car celles-ci peuvent être utilisées comme des sources de descripteurs permettant d'indexer des documents audiovisuels. Les méthodologies et les outils pour construire de tels objets existent, mais peu proposent une aide concrête pour organiser les concepts entre eux et expliciter le sens attribué aux termes mobilisés. Cet article propose d'utiliser une méthodologie basée sur la sémantique différentielle pour normaliser le sens des termes manipulés dans l'ontologie. Il présente un éditeur d'ontologies, DOE, dont l'objectif est de prendre en charge cette méthodologie, et avec lequel plusieurs ontologies sont actuellement en cours de construction.

[bachimont2002a] Bruno Bachimont, Raphaël Troncy, Antoine Isaac,
Semantic Commitment for Designing Ontologies: A Proposal,
Proc. 13th international conference on knowledge engineering and knowledge management (EKAW), Siguenza (ES), (Asunción Gómez Pérez, Richard Benjamins (eds), 13th International Conference on Knowledge Engineering and Knowledge Management (EKAW'02), *Lecture notes in computer science* 2473, 2002), pp114-121, 2002
https://exmo.inria.fr/files/publications/bachimont2002a.pdf

The French institute INA is interested in ontologies in order to describe the content of audiovisual documents. Methodologies and tools for building such objects exist, but few propose complete guidelines to help the user to organize the key components of ontologies: subsumption hierarchies. This article proposes to use a methodology introducing a clear semantic commitment to normalize the meaning of the concepts. We have implemented this methodology in an editor, DOE, complementary to other existing tools, and used it to develop several ontologies.

[troncy2003a] Raphaël Troncy,
Le raisonnement dans les descriptions documentaires: l'apport de la représentation des

connaissances,
Actes 14e journées francophones sur Ingénierie des Connaissances (IC), Laval (FR), pp161-176, (2 juillet) 2003
Prix de la meilleure communication
https://exmo.inria.fr/files/publications/troncy2003a.pdf

Décrire des documents audiovisuels, c'est prendre en compte des considérations documentaires (la forme d'une émission) et conceptuelles (son contenu). La formalisation de ces descriptions est une piste pour rendre plus aisée la recherche ou plus généralement la manipulation de ces documents. Dans cet article, nous proposons une architecture permettant la construction d'une base de connaissances sur laquelle il est possible d'effectuer des raisonnements tant sur la structure que sur le contenu.

[troncy2003b] Raphaël Troncy,
Integrating structure and semantics into audio-visual documents,
Proc. 2nd conference on International semantic web conference (ISWC), Sanibel Island (FL US), (Dieter Fensel, Katia Sycara, John Mylopoulos (eds), The semantic web, *Lecture notes in computer science* 2870, 2003), pp566-581, 2003
https://exmo.inria.fr/files/publications/troncy2003b.pdf

Describing audio-visual documents amounts to consider documentary aspects (the structure) as well as conceptual aspects (the content). In this paper, we propose an architecture which describes formally the content of the videos and which constrains the structure of their descriptions. This work is based on languages and technologies underlying the Semantic Web and in particular ontologies. Therefore, we propose to combine emerging Web standards, namely MPEG-7/XML Schema for the structural part and OWL/RDF for the knowledge part of the description. Finally, our work offers reasoning support on both aspects when querying a database of videos.

[troncy2003c] Raphaël Troncy, Antoine Isaac, Véronique Malaisé,
Using XSLT for interoperability: DOE and the travelling domain experiment,
Proc. 2nd workshop on evaluation of ontology-based tools (EON), Sanibel Island (FL US), pp92-102, 2003
http://ceur-ws.org/Vol-87/EON2003_Troncy.pdf

[viollet2004a] Alexandre Viollet,
Un protocole entre agents pour l'alignement d'ontologies,
Mémoire de mastère d'informatique, Université Joseph Fourier-INPG, Grenoble (FR), 2004
https://exmo.inria.fr/files/reports/m2r-viollet.pdf

Les agents sont des programmes autonomes et communicants, conçus pour interagir avec d'autres agents. Dans notre cas les agents sont cognitifs: ils manipulent des connaissances; ces connaissances sont représentées sous forme d'ontologies. Pour communiquer entre eux les agents s'échangent des messages en respectant un formalisme basé sur la théorie des actes de langage. Le langage de communication FIPA-ACL (le plus en vogue actuellement), permet également de spécifier l'ontologie utilisée pour exprimer le contenu du message. Il n'existe cependant pas de formalisme universel propre au contenu sémantique d'un message. Lors d'un échange de messages il convient donc de mettre en rapport les deux ontologies différentes; c'est pour cela qu'a été développée la notion d'alignement, à savoir un ensemble de couples pondérés d'éléments issus de deux ontologies. Sur cette base, notre travail consiste à définir un protocole de communication entre agents qui leur permette de mettre en correspondance leurs ontologies pour pouvoir partager du sens. A cette fin nous intègrerons la notion d'alignement, ainsi que des ressources extérieures dont les agents auront besoin pour manipuler les alignements et optimiser leurs interactions. Enfin, et afin de pouvoir s'intégrer de manière transparente dans un dialogue entre deux agents, le protocole se doit d'être modulaire.

[weise2014a] Mathias Weise, María Poveda Villalón, Mari Carmen Suárez-Figueroa, Raúl García Castro, Jérôme Euzenat, Luz Maria Priego, Bruno Fies, Andrea Cavallaro, Jan Peters-Anders, Kleopatra Zoi Tsagkari,
Ontologies and datasets for energy management system interoperability,
Deliverable 2.2, Ready4SmartCities, 72p., October 2014
https://exmo.inria.fr/files/reports/r4sc-22.pdf

[weise2015a] Mathias Weise, María Poveda Villalón, Raúl García Castro, Jérôme Euzenat, Luz Maria Priego, Bruno Fies, Andrea Cavallaro, Jan Peters-Anders, Kleopatra Zoi Tsagkari,
Ontologies and datasets for energy management system interoperability,

Deliverable 2.3, Ready4SmartCities, 149p., 2015
https://exmo.inria.fr/files/reports/r4sc-23.pdf

[wrigley2010a] Stuart Wrigley, Raúl García Castro, Liliana Cabral, Dorothee Reinhard, Cássia Trojahn dos Santos, Stephan Grimm, Mikalai Yatskevich,
Design of the first evaluation campaign,
Deliverable 3.2, SEALS, 40p., 2010
http://about.seals-project.eu/downloads/category/1-?download=9%3Ad3.2

This deliverable is concerned with the implementation of the evaluation campaign based upon the methodology and design recommendations made in SEALS Deliverable D3.1. This deliverable covers the initial preparation of the first SEALS Evaluation Campaign and describes the tasks that have been performed during the Initiation and Involvement phases. Furthermore, the deliverable describes the steps to be taken over the next few months and the actors who are responsible for those steps.

[wrigley2011a] Stuart Wrigley, Raúl García Castro, Liliana Cabral, Cássia Trojahn dos Santos, Christian Meilicke, Lyndon Nixon, Mikalai Yatskevich,
Design of the second evaluation campaign,
Deliverable 3.5, SEALS, 40p., 2011
http://about.seals-project.eu/downloads/category/1-?download=69%3Ad3.5-design-of-the-second

This deliverable is concerned with the implementation of the second evaluation campaign based upon the methodology and design recommendations made in SEALS Deliverable D3.1. This deliverable covers the initial preparation of the second SEALS Evaluation Campaign and describes the tasks that have been performed during the Initiation and Involvement phases. Furthermore, the deliverable describes the steps to be taken over the next few months and the actors who are responsible for those steps.

[wudagechekol2011a] Melisachew Wudage Chekol, Jérôme Euzenat, Pierre Genevès, Nabil Layaïda,
PSPARQL query containment,
Research report 7641, INRIA, Grenoble (FR), 32p., June 2011
http://hal.inria.fr/inria-00598819
https://exmo.inria.fr/files/reports/rr-inria-7641.pdf

Querying the semantic web is mainly done through SPARQL. This language has been studied from different perspectives such as optimization and extension. One of its extensions, PSPARQL (Path SPARQL) provides queries with paths of arbitrary length. We study the static analysis of queries written in this language, in particular, containment of queries: determining whether, for any graph, the answers to a query are contained in those of another query. Our approach consists in encoding RDF graphs as transition systems and queries as mu-calculus formulas and then reducing the containment problem to testing satisfiability in the logic. We establish complexity bounds and report experimental results.

[wudagechekol2011b] Melisachew Wudage Chekol, Jérôme Euzenat, Pierre Genevès, Nabil Layaïda,
PSPARQL query containment,
Proc. 13th International symposium on database programming languages (DBPL), Seattle (WA US), 2011
http://www.cs.cornell.edu/conferences/dbpl2011/papers/dbpl11-chekol.pdf
https://exmo.inria.fr/files/publications/wudagechekol2011b.pdf

Querying the semantic web is mainly done through SPARQL. This language has been studied from different perspectives such as optimization and extension. One of its extensions, PSPARQL (Path SPARQL) provides queries with paths of arbitrary length. We study the static analysis of queries written in this language, in particular, containment of queries: determining whether, for any graph, the answers to a query are contained in those of another query. Our approach consists in encoding RDF graphs as transition systems and queries as mu-calculus formulas and then reducing the containment problem to testing satisfiability in the logic.

[wudagechekol2012a] Melisachew Wudage Chekol, Jérôme Euzenat, Pierre Genevès, Nabil Layaïda,
SPARQL query containment under RDFS entailment regime,
Proc. 6th International joint conference on automated reasoning (IJCAR), Manchester (UK), (Bernhard Gramlich, Dale Miller, Uli Sattler (eds), (Proc. 6th International joint conference on automated reasoning (IJCAR)), *Lecture notes in computer science* 7364, 2012), pp134-148, 2012
https://exmo.inria.fr/files/publications/wudagechekol2012a.pdf

The problem of SPARQL query containment is defined as determining if the result of one query is included in the result of another one for any RDF graph. Query containment is important in many areas, including information integration,

query optimization, and reasoning about Entity-Relationship diagrams. We encode this problem into an expressive logic called the mu-calculus where RDF graphs become transition systems, queries and schema axioms become formulas. Thus, the containment problem is reduced to formula satisfiability. Beyond the logic's expressive power, satisfiability solvers are available for it. Hence, this study allows to exploit these advantages.

[wudagechekol2012b] Melisachew Wudage Chekol, Jérôme Euzenat, Pierre Genevès, Nabil Layaïda,
SPARQL query containment under SHI axioms,
Proc. 26th American national conference on artificial intelligence (AAAI), Toronto (ONT CA), pp10-16, 2012
http://www.aaai.org/ocs/index.php/AAAI/AAAI12/paper/view/4924
https://exmo.inria.fr/files/publications/wudagechekol2012b.pdf

SPARQL query containment under schema axioms is the problem of determining whether, for any RDF graph satisfying a given set of schema axioms, the answers to a query are contained in the answers of another query. This problem has major applications for verification and optimization of queries. In order to solve it, we rely on the mu-calculus. Firstly, we provide a mapping from RDF graphs into transition systems. Secondly, SPARQL queries and RDFS and SHI axioms are encoded into mu-calculus formulas. This allows us to reduce query containment and equivalence to satisfiability in the mu-calculus. Finally, we prove a double exponential upper bound for containment under SHI schema axioms.

[wudagechekol2012c] Melisachew Wudage Chekol, Jérôme Euzenat, Pierre Genevès, Nabil Layaïda,
A benchmark for semantic web query containment, equivalence and satisfiability,
Research report 8128, INRIA, Grenoble (FR), 10p., July 2012
https://hal.inria.fr/hal-00749286
https://exmo.inria.fr/files/reports/rr-inria-8128.pdf

The problem of SPARQL query containment has recently attracted a lot of attention due to its fundamental purpose in query optimization and information integration. New approaches to this problem, have been put forth, that can be implemented in practice. However, these approaches suffer from various limitations: coverage (size and type of queries), response time (how long it takes to determine containment), and the technique applied to encode the problem. In order to experimentally assess implementation limitations, we designed a benchmark suite offering different experimental settings depending on the type of queries, projection and reasoning (RDFS). We have applied this benchmark to three available systems using different techniques highlighting the strengths and weaknesses of such systems.

[wudagechekol2012e] Melisachew Wudage Chekol,
Static analysis of semantic web queries,
Thèse d'informatique, Université de Grenoble, Grenoble (FR), December 2012
https://exmo.inria.fr/files/thesis/thesis-chekol.pdf

Query containment is defined as the problem of determining if the result of a query is included in the result of another query for any given dataset. It has major applications in query optimization and knowledge base verification. The main objective of this thesis is to provide sound and complete procedures to determine containment of SPARQL queries under expressive description logic axioms. Further, we implement these procedures to support theoretical results by experimentation. To date, testing query containment has been performed using different techniques: containment mapping, canonical databases, automata theory techniques and through a reduction to the validity problem in logic. In this thesis, we use the later technique to test containment of SPARQL queries using an expressive logic called mu-calculus. In doing so, RDF graphs are encoded as transition systems which preserves its characteristics, and queries and schema axioms are encoded as mu-calculus formulae. Thereby, query containment can be reduced to the validity test in the logic. This thesis identifies various fragments of SPARQL (and PSPARQL) and description logic schema languages for which containment is decidable. Additionally, it provides theoretically and experimentally proven procedures to check containment of those decidable fragments. Finally, this thesis proposes a benchmark for containment solvers. This benchmark is used to test and compare the current state-of-the-art containment solvers.

[wudagechekol2013a] Melisachew Wudage Chekol, Jérôme Euzenat, Pierre Genevès, Nabil Layaïda,
Evaluating and benchmarking SPARQL query containment solvers,
Proc. 12th conference on International semantic web conference (ISWC), Sydney (NSW AU), (Harith Alani, Lalana Kagal, Achile Fokoue, Paul Groth, Chris Biemann, Josiane Xavier Parreira, Lora Aroyo, Natalya Noy, Christopher Welty, Krzysztof Janowicz (eds), The semantic web (Proc. 12th conference on International semantic web conference (ISWC)), *Lecture notes in computer science* 8219, 2013), pp408-423, 2013
https://exmo.inria.fr/files/publications/wudagechekol2013a.pdf

Query containment is the problem of deciding if the answers to a query are included in those of another query for any

queried database. This problem is very important for query optimization purposes. In the SPARQL context, it can be equally useful. This problem has recently been investigated theoretically and some query containment solvers are available. Yet, there were no benchmarks to compare theses systems and foster their improvement. In order to experimentally assess implementation strengths and limitations, we provide a first SPARQL containment test benchmark. It has been designed with respect to both the capabilities of existing solvers and the study of typical queries. Some solvers support optional constructs and cycles, while other solvers support projection, union of conjunctive queries and RDF Schemas. No solver currently supports all these features or OWL entailment regimes. The study of query demographics on DBPedia logs shows that the vast majority of queries are acyclic and a significant part of them uses UNION or projection. We thus test available solvers on their domain of applicability on three different benchmark suites. These experiments show that (i) tested solutions are overall functionally correct, (ii) in spite of its complexity, SPARQL query containment is practicable for acyclic queries, (iii) state-of-the-art solvers are at an early stage both in terms of capability and implementation.

[zhdanova2004a] Anna Zhdanova, Matteo Bonifacio, Stamatia Dasiopoulou, Jérôme Euzenat, Rose Dieng-Kuntz, Loredana Laera, David Manzano-Macho, Diana Maynard, Diego Ponte, Valentina Tamma,
Specification of knowledge acquisition and modeling of the process of the consensus,
Deliverable 2.3.2, Knowledge web, 92p., December 2004
http://knowledgeweb.semanticweb.org/semanticportal/servlet/download?ontology=Documentation+
https://exmo.inria.fr/files/reports/kweb-232.pdf

In this deliverable, specification of knowledge acquisition and modeling of the process of consensus is provided.

[zimmermann2006a] Antoine Zimmermann, Markus Krötzsch, Jérôme Euzenat, Pascal Hitzler,
Formalizing ontology alignment and its operations with category theory,
Proc. 4th International conference on Formal ontology in information systems (FOIS), Baltimore (ML US), (Brandon Bennett, Christiane Fellbaum (eds), (Proc. 4th International conference on Formal ontology in information systems (FOIS)), IOS Press, Amsterdam (NL), 2006), pp277-288, 2006
https://exmo.inria.fr/files/publications/zimmermann2006a.pdf

An ontology alignment is the expression of relations between different ontologies. In order to view alignments independently from the language expressing ontologies and from the techniques used for finding the alignments, we use a category-theoretical model in which ontologies are the objects. We introduce a categorical structure, called V-alignment, made of a pair of morphisms with a common domain having the ontologies as codomain. This structure serves to design an algebra that describes formally what are ontology merging, alignment composition, union and intersection using categorical constructions. This enables combining alignments of various provenance. Although the desirable properties of this algebra make such abstract manipulation of V-alignments very simple, it is practically not well fitted for expressing complex alignments: expressing subsumption between entities of two different ontologies demands the definition of non-standard categories of ontologies. We consider two approaches to solve this problem. The first one extends the notion of V-alignments to a more complex structure called W-alignments: a formalization of alignments relying on "bridge axioms". The second one relies on an elaborate concrete category of ontologies that offers high expressive power. We show that these two extensions have different advantages that may be exploited in different contexts (viz., merging, composing, joining or meeting): the first one efficiently processes ontology merging thanks to the possible use of categorical institution theory, while the second one benefits from the simplicity of the algebra of V-alignments.

[zimmermann2006b] Antoine Zimmermann, Jérôme Euzenat,
Three semantics for distributed systems and their relations with alignment composition,
Proc. 5th conference on International semantic web conference (ISWC), Athens (GA US), (Isabel Cruz, Stefan Decker, Dean Allemang, Chris Preist, Daniel Schwabe, Peter Mika, Michael Uschold, Lora Aroyo (eds), The semantic web - ISWC 2006 (Proc. 5th conference on International semantic web conference (ISWC)), *Lecture notes in computer science* 4273, 2006), pp16-29, 2006
https://exmo.inria.fr/files/publications/zimmermann2006b.pdf
http://iswc2006.semanticweb.org/items/Zimmermann2006jw.pdf

An ontology alignment explicitly describes the relations holding between two ontologies. A system composed of ontologies and alignments interconnecting them is herein called a distributed system. We give three different semantics of a distributed system, that do not interfere with the semantics of ontologies. Their advantages are compared, with respect to allowing consistent merge of ontologies, managing heterogeneity and complying with an alignment composition operation. We show that only the two first variants, which differ from other proposed semantics, can offer a sound composition operation.

[zimmermann2007a] Antoine Zimmermann,

Integrated distributed description logics,
Proc. 20th International workshop on description logic (DL), Brixen/Bressanone (IT), (Diego Calvanese, Enrico Franconi, Volker Haarslev, Domenico Lembo, Boris Motik, Sergio Tessaris, Anni-Yasmin Turhan (eds), (Proc. 20th International workshop on description logic (DL)), Bolzano University Press, Bolzano (IT), 2007), pp507-514, 2007
https://exmo.inria.fr/files/publications/zimmermann2007a.pdf

We propose a Description-Logics-based language that extends standard DL with distributed capabilities. More precisely, it offers the possibility to formally describe the semantic relations that exist between two ontologies in a networked knowledge-based system. Contrary to Distributed Description Logics, it is possible to compose correspondences (or bridge rules), while still being able to hide some of the discrepancies between ontologies. Moreover, when ontologies have no nominals, no A-Box axioms, and correspondences are restricted to cross-ontology subsumption, the satisfiability of a local ontology is not influenced by ontology alignments and other ontologies, i.e., local deduction is invariant to the change of the outer system. Although we do not have a complete reasoning procedure, we provide inference rules and semantic properties, and a discussion on reasoning in this formalism.

[zimmermann2008a] Antoine Zimmermann, Chan Le Duc,
Reasoning with a network of aligned ontologies,
Research report 6484, INRIA Rhône-Alpes, Grenoble (FR), 38p., June 2008
http://hal.inria.fr/inria-00267808
https://exmo.inria.fr/files/reports/rr-inria-6484.pdf

In the context of the Semantic Web or semantic P2P systems, many ontologies may exist and be developed independently. Ontology alignments help integrating, mediating or simply reasoning with a system of networked ontologies. Though different formalisms have already been defined to reason with such systems, they do not consider ontology alignments as first class objects designed by third party ontology matching systems. Correspondences between ontologies are often asserted from an external point of view encompassing both ontologies. We propose a formalism, Integrated Distributed Description Logics (IDDL), which treats local knowledge (ontologies) and global knowledge (inter-ontology semantic relations, i.e. alignments) separately by distinguishing local interpretations and global interpretation. In this report, we identify relevant requirements for the semantics of such distributed systems. From this analysis, we argue that IDDL complies with these requirements. We then present a reasoning procedure for IDDL systems which uses local reasoners in a modular way. It proves that consistency of an IDDL system is decidable if consistency of the local logics is decidable and it provides an upper bound for the complexity of consistency checking.

[zimmermann2008b] Antoine Zimmermann, Chan Le Duc,
Reasoning on a network of aligned ontologies,
Proc. 2nd International conference on web reasoning and rule systems (RR), Karlsruhe (DE), (Diego Calvanese, Georg Lausen (eds), (Proc. 2nd International conference on web reasoning and rule systems (RR)), *Lecture notes in computer science* 5341, 2008), pp43-57, 2008
https://exmo.inria.fr/files/publications/zimmermann2008b.pdf

In the context of the Semantic Web or semantic peer to peer systems, many ontologies may exist and be developed independently. Ontology alignments help integrating, mediating or reasoning with a system of networked ontologies. Though different formalisms have already been defined to reason with such systems, they do not consider ontology alignments as first class objects designed by third party ontology matching systems. Correspondences between ontologies are often asserted from an external point of view encompassing both ontologies. We study consistency checking in a network of aligned ontologies represented in Integrated Distributed Description Logics (IDDL). This formalism treats local knowledge (ontologies) and global knowledge (inter-ontology semantic relations, i.e., alignments) separately by distinguishing local interpretations and global interpretation so that local systems do not need to directly connect to each other. We consequently devise a correct and complete algorithm which, although being far from tractable, has interesting properties: it is independent from the local logics expressing ontologies by encapsulating local reasoners. This shows that consistency of a IDDL system is decidable whenever consistency of the local logics is decidable. Moreover, the expressiveness of local logics does not need to be known as long as local reasoners can handle at least ALC.

[zimmermann2008c] Antoine Zimmermann,
Sémantique des réseaux de connaissances: gestion de l'hétérogénéité fondée sur le principe de médiation,
Thèse d'informatique, Université Joseph Fourier, Grenoble (FR), novembre 2008
https://exmo.inria.fr/files/thesis/these-zimmermann.pdf

On souhaite modéliser la sémantique d'un réseau de connaissances hétérogènes mises en correspondances. On suppose que ces réseaux sont représentés par un ensemble d'ontologies reliées entre elles par des alignements d'ontologies.

Dans un contexte comme le Web ou certains réseaux pair-à-pair, diverses ontologies sont accessibles mais fortement hétérogènes en termes d'expressivité et de modélisation. Aussi, les systèmes d'inférence associés peuvent être indépendants les uns des autres. Je propose une sémantique générique pour ces réseaux, tolérante à l'hétérogénéité et permettant d'exploiter des systèmes existants sans les perturber. Cette sémantique garantie par ailleurs le principe de médiation, et permet une réutilisabilité des alignements et des ontologies. J'en propose quatre applications : les ontologies modulaires ; un langage d'alignement expressif distinct du langage d'ontologies ; un opérateur de composition d'alignements ; une procédure de raisonnement distribué.

[zamazal2009a] Ond#ej Sváb-Zamazal, Vojtech Svátek, Jérôme David, François Scharffe,
Towards metamorphic semantic models,
Proc. 6th poster session (ESWC), Heraklion (GR), 2009

Ontological model transformation inside the OWL formalism, preserving the intended meaning across modelling styles, could support diverse kinds of semantic web applications. Three use cases are mentioned, which could share a single ontology transformation service based on a transformation pattern library. We discuss the ontology matching use case in more detail and illustrate on a simple example.

[zamazal2009b] Ond#ej Sváb-Zamazal, Vojtech Svátek, François Scharffe,
Pattern-based ontology transformation service,
Proc. 1st IK3C international conference on knowledge engineering and ontology development (KEOD), Funchal (PT), pp210-223, 2009
https://exmo.inria.fr/files/publications/zamazal2009b.pdf

Many use cases for semantic technologies (eg. reasoning, modularisation, matching) could benefit from an ontology transformation service. This service is supported with ontology transformation patterns consisting of corresponding ontology patterns capturing alternative modelling choices, and an alignment between them. In this paper we present the transformation process together with its two constituents: a pattern detection and an ontology transformation process. The pattern detection process is based on SPARQL and the transformation process is based on an ontology alignment representation with specific extensions regarding detailed information about the transformation.

Generated by Transmorpher