Ontologies Fall 2018 RPI Syllabus
Instructors: Prof. Deborah L. McGuinness and Ms. Elisa Kendall
Guest Lecturers: Jim McCusker
Class Manager: Rebecca Cowan
Class main page: https://tw.rpi.edu/web/Courses/Ontologies/2018
This page on google docs:
https://docs.google.com/document/d/16bToiqg2tYk_i8306EoR4jJOf1cDkLI-DVHSpdTQ-oE/edit?usp=sharing
Location: Winslow Building 1140 (First Floor conference space)
Course member spreadsheet:
https://docs.google.com/spreadsheets/d/1tbUle2xEIO818UMFKmePKmyphsuYZ7yN5diV57qy6FU/edit#gid=0
Note: This syllabus page will be updated as class progresses. Please check back regularly.
If you are wanting to get into this class and have not been able to register, please come to the first class.

Course Materials:

Recommended books for this course:

- Allemang, D., & Hendler, J. *Semantic Web for the Working Ontologist, Second Edition: Effective Modeling in RDFS and OWL*. Morgan Kaufmann Publishers, Waltham, MA, 2011. [ISBN:978-0-12-385965-5] -- Available from Amazon at http://www.amazon.com/Semantic-Web-Working-Ontologist-Second/dp/0123859654

- Tom Heath and Christian Bizer (2011). *Linked Data: Evolving the Web into a Global Data Space* (1st edition). Synthesis Lectures on the Semantic Web: Theory and Technology, 1:1, 1-136. Morgan & Claypool. (here is the free version)

- Franz Baader, Diego Calvanese, Deborah L. McGuinness, Daniele Nardi, and Peter F. Patel-Schneider, editors. *The Description Logic Handbook: Theory, Implementation and Applications, Second Edition*. Cambridge University Press, June 28, 2010. [ISBN: 978-0521150118]. Available from Amazon at http://www.amazon.com/Description-Logic-Handbook-Implementation-Applications/dp/0521150116
- Forthcoming (published April 2019). Elisa Kendall and Deborah L. McGuinness. Ontology Engineering. Synthesis Lectures on the Semantic Web: Theory and Technology, **ISBN:** 9781681733081, Morgan & Claypool, 2019. http://www.morganclaypoolpublishers.com/catalog_Orig/product_info.php?products_id=1395

Recommended software for this class:

- Protégé - Available from the Stanford Center for Biomedical Informatics Research at the Stanford University School of Medicine, at http://protege.stanford.edu/products.php, Protégé 5.2 (desktop version)
- Concept Maps (Cmaps) tool from the Institute for Human and Machine Cognition (IHMC), at http://cmap.ihmc.us/
- MagicDraw© 17.0.5 and Visual Ontology Modeler (VOM) - Available via Google Docs (see instructions, provided the second week of class)

NOTICE: Numerous readings will be provided by a link to an online paper. Some of the readings may be inaccessible off campus. You may download them on campus or via vpn if you have access problems.
NOTICE: Remember to check back as the contents are expected to be updated as the term progresses
NOTICE: For the complete reading list, including citations with link(s) to papers, see below.

Remote meeting information (webex):

Meeting link:
https://thematix.webex.com/thematix/j.php?MTID=m15c988777966ef4758b610568aec3067

Meeting number: 624 221 033

Meeting password: ontENGRrpi2018

Audio connection: 1-650-479-3208 Call-in toll number (US/Canada)
Access code: 624 221 033

CLASS 1 - Monday, September 10, 2018: Introduction to Ontology Engineering
Lecture 1 Slides:
https://drive.google.com/open?id=1M9SlhPh-swqDbSOH0o90IAPrXsK2j7rQ1oXu_jVR80o
Readings: Ontology Engineering, Semantic Web, Vocabularies, Ontologies COA
Assignment 1:
https://drive.google.com/open?id=1C5d-3uiCFsrwW5ribYW5ZJZ2de108YFvS18_7hB_DbQ
Summary: Turn in a maximum 2 PAGE description of the reading you liked best, two main points, and why you thought the points were interesting and useful. Also, include one idea for a use case that you might be interested in proposing for a class.

CLASS 2 - Monday, September 17, 2018: Use Case Development and Elaboration
Lecture 2 Slides:
https://docs.google.com/presentation/d/1G0BzqKAWqRMHf7my6wDjkn9fsP3tg_vuekblqIoeJNM/edit?usp=sharing
Readings: Ontology Engineering, Use-Case 2.0
Assignment 2:
https://drive.google.com/open?id=1Zy02xvZJIrWRWoOwerzeJ4Y0YoHdg4TwhNlSVaVJKtc
Summary: Use-Case Driven Knowledge Encoding Part 1 - develop a preliminary use case (individually), presentation to peers during Class 3
Use case template:
https://docs.google.com/document/d/1A2w-xoN5aRwlSoCTEtDsWjs2caYDRD5bANif6icDS6k/edit?usp=sharing

CLASS 3 - Monday, September 24, 2018: Evaluating Use Cases and Project Topic Discussion
Use Case Presentations
Lecture 3 Slides:
https://docs.google.com/presentation/d/1Ow-gFJPqa31j9ChrKvvdM9JaYfIplrCUAeWHUV7ta6g/edit?usp=sharing
Readings: ISO 704, Ontology Engineering, Competency Questions, Methodology
Assignment 3:
https://docs.google.com/document/d/1OyOfwRMmnZZJIOc6Zdn6h6CnCU_H_0jt8XzZzlGb2lA/edit?usp=sharing
Note – Individual students present use cases in class this class
Summary: Use-Case Driven Knowledge Encoding Part 2 - (1) revise the Assignment 2 use case, or (2) create a new use case, including significant expansion over the first version as well as at least 3 use case and activity diagrams, as a group activity

CLASS 4 - Monday, October 1, 2018: Terminology, Vocabulary, and Natural Language Processing (NLP)
Lecture 4 Slides:
https://drive.google.com/open?id=1z_NIRUnHM7s9QZYm3lsUOc1gByQyg69C_SPbQgRUT30
Readings: Conceptual Modeling, Living with CLASSIC, Ontology 101
Note - Teams present use cases in class this class.

Assignment 4:
https://docs.google.com/document/d/1E3dGRk8S7FSepCpZ4KBeVzu_pvB5AfgLCoTEN4sdHhE/edit?usp=sharing
Summary: Terminology Development and Harmonization - develop a term list, definitions and provenance for the terms for a given use case; spreadsheet format for terminology and annotations is available at
https://docs.google.com/spreadsheets/d/1gSb6AqSuHEuVZbSLqJ2A-m0Npcnj6gJEaznzSka8jNA/edit?usp=sharing

CLASS 5 - ***Tuesday, October 9, 2018***: Conceptual Modeling and Domain Analysis
Lecture 5 Slides:
https://docs.google.com/presentation/d/1WZPe5v9lV5HQmoYWhH_QRHJQREIaECpYSaeQNX08smM/edit?usp=sharing
Readings: Ontology Engineering, RDFS 1.1, From SHIQ and RDF to OWL, OWL Guide, OWL 2 (Next Steps), OWL 2 Quick Reference Guide, Working Ontologist
Assignment 5:
https://docs.google.com/document/d/18nj3WNLvKbna-VPn-UJYcdOHSNXHTH2jL5MafgS7mlA/edit?usp=sharing
Summary: Conceptual Model - class hierarchy sketch, preliminary conceptual model

Class 6 - Monday, October 15, 2018: An Introduction to the Resource Description Framework (RDF) and Web Ontology Language (OWL)
Lecture 6 Slides:
https://docs.google.com/presentation/d/15fATdW5qxii5EHmcyJD7qlu63SlWC4FjLTMULaKFPco/edit?usp=sharing
Readings: Introduction to Description Logics, Basic Description Logics, Chapter 3 Description Logics, Description Logics in Data Management
Assignment 6:
https://docs.google.com/document/d/1EMDOmzKklLKaEJn7RFHNWZ0kIxldLdFtFdJcIePvwlQ/edit?usp=sharing
Summary: Preliminary Ontology Development

Class 7 - Monday, October 22, 2018: An Introduction Description Logics
Lecture 7 Slides:
https://drive.google.com/open?id=1HxPZzDgceKb2KmxjAbc3t6t5bGgpFoNbOMGxsAca4qM
Readings: HermiT, Pellet, TrOWL
Assignment 7:
https://docs.google.com/document/d/1byce8AuOPfFO5YU3qPmiX2lVzIbDik9XfQEo1njI36k/edit?usp=sharing
Summary: Revised Ontology - ontology extensions including property restrictions, encoding restrictions using DL syntax

Class 8 - Monday, October 29, 2018: Best Practices in Ontology Development, Using Tools to Check Your Ontology: Syntax, Semantics, and Regression Testing
Lecture 8 Slides:
https://docs.google.com/presentation/d/1lotSqIZs_r7D7NkGLg3Db2I6RlwMvQtTN0e-Su8eDzg/edit?usp=sharing
Readings: Knowledge Graph, KG for Science, Nanopublications
Assignment 8:
https://docs.google.com/document/d/1QJ9RkZ2T_1Y_vFH8FcXDfc-3v5rj71AqF6-0STmtCLg/edit?usp=sharing
Summary: Revised Ontology - ontology individuals, imports and testing exercise

Class 9 - Monday, November 5, 2018: Knowledge Graphs and Information Extraction
Lecture 9 Slides: Part 1:
https://docs.google.com/presentation/d/1T6mdc2C448TZAaVLRzMSgjz0o1VlABDKZTDWdODZKgQ/edit?usp=sharing
Readings: Working Ontologist, Template-Based Query Answering
Assignment 9:
https://docs.google.com/document/d/1W_LIHTFn5gD60KiUNhx_QHQJ9zmnlfz_WambB2vq-yM/edit?usp=sharing
Summary: Revised Ontology - extensions to cover all competency questions, including individuals; web site updates

Class 10 - Monday, November 12, 2018: Question Answering in SPARQL
Lecture 10 Slides: (static):
https://docs.google.com/presentation/d/1iKDDBRG5HCYnYTUfLvphFy8TnF8qKtWYG4Fil0xWVP8/edit?usp=sharing
(dynamic): http://orion.tw.rpi.edu/~jimmccusker/presentations/oe_sparql.html
Examples to try: http://orion.tw.rpi.edu/~jimmccusker/presentations/oe_sparql.html#/
Additional exercises:
https://docs.google.com/presentation/d/1K-WytOoLqmVMmfrB2uHamu7NiLeFGpfSLqr6wEu5LZA/edit?usp=sharing
Readings: PROV-O, PAV Ontology, Water Quality Portal, D-PROV, DoCO
Assignment 10:
https://docs.google.com/document/d/1U0uS0cmj4pvLoO1RXap_npbQgtDUCIJvH80qktVHK4U/edit?usp=sharing
Summary: Question Answering - using the competency questions from the use case, create SPARQL queries that answer at least 5 questions, with different semantic content for each question and describe any portions of the questions that were either inconvenient or impossible to encode.
Note that you will be presenting your competency questions from your team web site at the start of next week's class.

Class 11 - Monday, November 19, 2018: Provenance, References, and Evidence Citation

Lecture 11 Slides:
https://docs.google.com/presentation/d/1WhihAxud6O_MDWYGc68Tq5f-GcbfODnqCTNqfIj0luM/edit?usp=sharing
Readings: Chimaera, NIST, Usage Scenarios, OntoClean 2.0, Oops!, Ontology Evolution, Merging and Testing, Evolva, Query Answering (DL-Safe)
Assignment 11:
https://docs.google.com/document/d/1zHahWqEx2JO3pRWw2FmRo82FGTDLQfWODbvm8FA_Xng/edit?usp=sharing
Summary: Ontology Extension with Annotations - using the term list, definitions, and other source details from term lists, extend ontologies using annotations to increase the terminology coverage, adding property hierarchies and axioms such as transitivity

Class 12 - Monday, November 26, 2018: Ontology Evaluation, Evolution and Maintenance Policies
Lecture 12 Slides:
https://docs.google.com/presentation/d/1t8nBWXj5qI6nEfviecbRMjFGGXS4scRLsmcl5qljyNg/edit?usp=sharing

Readings: Working Ontologist, Wine Agent, SemantAqua
Assignment 12:
https://docs.google.com/document/d/1Q3hECPPt3tfM8mEEKzhFO3FNEtJOtZKcEpCLLqzYLzE/edit?usp=sharing
Summary: Ontology Evaluation - use tools to evaluate ontologies, and (1) fix issues they find and (2) describe other kinds of issues the tools might check for, and (3) evaluate against competency questions; exercise includes finding at least one external ontology, import it or use portion of it, and discuss why you chose to reuse that (what you found of value) and the challenges you encountered, and (4) teams will establish going forward maintenance policies, publish those on their web sites, and migrate all project sites to the TW web site for ongoing maintenance and subsequent work, as appropriate. Note that you will be making a presentation of your mostly final web sites at the start of next week's class.

Class 13 - Monday, December 3, 2018: Putting it Altogether - Applications Using Ontologies
Lecture 13 Slides:
Assignment 13:
https://docs.google.com/presentation/d/1RxyjYBbJHFipOLlD8Dp_mx3GDUsev16fJp_5UeGJ7Gw/edit?usp=sharing
https://docs.google.com/document/d/1z8Ncl42I3ZnkCl77X3vvienJX4_n07hNDJl3YdtUo18/edit?usp=sharing
Summary: Final Project Planning - web site revisions, final project paper, presentation plan, with the understanding that every team member must present something in the final presentation

Class 14 - Monday, December 10, 2018 (final exam week following week): Project presentations and evaluation: Individual evaluations of team experience, individual

contributions, and extra credit for additional suggestions for ways to leverage and use provenance.
Lecture 14 Slides:
https://docs.google.com/presentation/d/1FbKPv6mKUvRPMPH1T2oIzCfWbiJwpVojvY48ifYoQfQ/edit?usp=sharing

Final project reports due December 17, 2018.

Reference List

Class 1 Reading Assignment:

- Ontology Engineering: Elisa Kendall and Deborah McGuinness (2018). *Ontology Engineering*, Synthesis Lectures on the Semantic Web: Theory and Technology, Ying Ding (editor), Morgan & Claypool. Chapters 1 & 2. These are drafts - note extra credit if you make suggestions/corrections to the chapters
    - https://drive.google.com/open?id=1thx_w-JZAp5yJxJWCI1E8BGXGss356Tq
    - https://drive.google.com/open?id=1IxQmNW7HlSwlOBTUZL8AqKa_7L-y7kGE
- Semantic Web: T Berners-Lee, J Hendler, O Lassila. The Semantic Web. Scientific American, 2001. alternative link - http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.115.9584&rep=rep1&type=pdf
- Vocabularies: W3C summary of the role of vocabularies in the Semantic Web, http://www.w3.org/standards/semanticweb/ontology (optional)
- Ontologies COA: McGuinness, D.L. "Ontologies come of age" https://www.researchgate.net/publication/221024668_Ontologies_Come_of_Age

Class 2 Reading Assignment:

- Ontology Engineering: Elisa Kendall and Deborah McGuinness (2018). *Ontology Engineering*, Synthesis Lectures on the Semantic Web: Theory and Technology, Ying Ding (editor), Morgan & Claypool. Chapter 3, Requirements and Use Cases. This is a draft - note extra credit if you make suggestions/corrections to the chapter
    - https://drive.google.com/open?id=1xZXYoEeWQEFyDdMropkzxatQn-2KyirI
- Use-Case 2.0: Ivar Jacobson, Ian Spense, and Kurt Bittner, Use-Case 2.0 - The Guide to Succeeding with Use Cases, Ivar Jacobson International, December 2011, pp 1-29. Available at https://www.ivarjacobson.com/sites/default/files/field_iji_file/article/use-case_2_0_jan11.pdf
- Use Cases: http://en.wikipedia.org/wiki/Use_case
- *Use Case Template:* - *https://docs.google.com/document/d/1A2w-xoN5aRwlSoCTEtDsWjs2caYDRD5bANif6icDS6k/edit?usp=sharing*
- Example Semantic Water Quality Monitoring Use Case: (retrieve the most recent upload) http://tw.rpi.edu/web/project/SemantAQUA/UseCases
- Example Investment Analysis Use Case (partial): https://docs.google.com/document/d/18gU-4MNOX22KnvZhr07D5iloGEyTY20DyTerwg_gf5Q/edit?usp=sharing

Optional:

- http://alistair.cockburn.us/index.php/Use_cases,_ten_years_later
- http://members.aol.com/acockburn/papers/AltIntro.htm

- http://www.digilife.be/quickreferences/pt/functional%20requirements%20and%20use%20cases.pdf
- http://alistair.cockburn.us/index.php/Resources_for_writing_use_cases
- http://alistair.cockburn.us/Usecasesintheoryandpractice180.ppt
- http://alistair.cockburn.us/Agileusecases1dy.ppt
- http://alistair.cockburn.us/index.php/Structuring_use_cases_with_goals
- http://www.foruse.com/publications/bibliographies/usecases.htm
- http://www.drdobbs.com/top-ten-use-case-mistakes/184414701

Class 3 Reading Assignment:

- ISO 704, Terminology work -- Principles and methods, http://semanticweb.kaist.ac.kr/org/tc37/pdocument/standards/ISO%20704.pdf
- Ontology Engineering: Elisa Kendall and Deborah McGuinness (2018). *Ontology Engineering*, Synthesis Lectures on the Semantic Web: Theory and Technology, Ying Ding (editor), Morgan & Claypool. Chapter 4, Terminology. This is a draft - note extra credit if you make suggestions/corrections to the chapter
  - https://drive.google.com/open?id=1stj36y_X0Ra4AmabvKNuo8-qCiw3pawY
- Competency Questions: Gruninger, Michael & Fox, Mark. The Role of Competency Questions in Enterprise Engineering. In Proceedings of the IFIP WG5.7 Workshop on Benchmarking - Theory and Practice (1994). Available at http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.11.9054
- Methodology: Gruninger, Michael & Fox, Mark. (1995). Methodology for the Design and Evaluation of Ontologies. In Workshop on Basic Ontological Issues in Knowledge Sharing, IJCAI-95, Montreal, Canada, Available at http://www.eil.utoronto.ca/wp-content/uploads/enterprise-modelling/papers/gruninger-ijcai95.pdf
- *Terminology Template -- https://docs.google.com/spreadsheets/d/1gSb6AqSuHEuVZbSLqJ2A-m0Npcnj6gJEaznzSka8jNA/edit?usp=sharing*

Class 4 Reading Assignment:

- Borgida, A. and Brachman, R. Conceptual Modeling with Description Logics. *The Description Logic Handbook: Theory, implementation, and applications*. Cambridge, England, United Kingdom. Cambridge University Press, 2003. Available at https://cdn.preterhuman.net/texts/science_and_technology/The%20Description%20Logic%20Handbook%20-%20Theory,%20Implementation%20and%20Applications%20(2003).pdf (Conceptual Modeling chapter only)
- Ronald J. Brachman, Deborah L. McGuinness, Peter F. Patel-Schneider, Lori Alperin Resnick and Alexander Borgida. Living with CLASSIC: When and How to Use a KL-ONE-Like Language. In *Principles of Semantic Networks: Explorations in the Representation of Knowledge*, edited by John F. Sowa, Morgan Kaufman Publishers,

San Mateo, CA, 1991. pp 401-456. Available at http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.381.980&rep=rep1&type=pdf

- Natalya F. Noy and Deborah L. McGuinness. Ontology Development 101: A Guide to Creating Your First Ontology. Stanford Knowledge Systems Laboratory Technical Report KSL-01-05 and Stanford Medical Informatics Technical Report SMI-2001-0880, March 2001. Available at: https://www.researchgate.net/publication/243772462_Ontology_Development_101_A_Guide_to_Creating_Your_First_Ontology

Class 5 Reading Assignment

- Ontology Engineering: Elisa Kendall and Deborah McGuinness (2018). *Ontology Engineering*, Synthesis Lectures on the Semantic Web: Theory and Technology, Ying Ding (editor), Morgan & Claypool. Chapter 5, Conceptual Modeling. This is a draft - note extra credit if you make suggestions/corrections to the chapter
    - https://drive.google.com/open?id=19Uq0TW5M_8h1MfWqY2gAQbCUp5rvDg1r
- Dan Brickley and R. V. Guha, editors. RDF Schema 1.1, W3C Recommendation, 25 February 2014. http://www.w3.org/TR/2014/REC-rdf-schema-20140225/
- Ian Horrocks, Peter F. Patel-Schneider, and Frank van Harmelen.
- From SHIQ and RDF to OWL: The Making of a Web Ontology Language, Journal of Web Semantics, (1)1:7-26, 2003. http://www.comlab.ox.ac.uk/people/ian.horrocks/Publications/download/2003/HoPH03a.pdf
- Michael K. Smith, Chris Welty, and Deborah L. McGuinness. OWL Web Ontology Language Guide. World Wide Web Consortium (W3C) Recommendation. February 10, 2004.
- Bernardo Cuenca Grau, Ian Horrocks, Boris Motik, Bijan Parsia, Peter Patel-Schneider, and Ulrike Sattler. OWL 2: The Next Step for OWL. Journal of Web Semantics (6)4:309-322, November 2008. http://www.cs.ox.ac.uk/people/ian.horrocks/Publications/download/2008/CHMP+08.pdf
- Jie Bao, Elisa F. Kendall, Deborah L. McGuinness, and Peter F. Patel-Schneider, editors. OWL 2 Web Ontology Language Quick Reference Guide (Second Edition), W3C Recommendation, 11 December 2012. http://www.w3.org/TR/2012/REC-owl2-quick-reference-20121211/
- Semantic Web for the Working Ontologist (Allemang and Hendler), first three chapters. The book is available at the RPI Library (check availability at library.rpi.edu), and from Amazon at: https://www.amazon.com/Semantic-Web-Working-Ontologist-Second/dp/0123859654 (optional)

Class 6 Reading Assignment

- D. Nardi and R. J. Brachman. An Introduction to Description Logics. *The Description Logic Handbook: Theory, implementation, and applications*. Cambridge, England, United Kingdom. Cambridge University Press, 2003. <Fill in link here>

- F. Baader and W. Nutt. Basic Description Logics. *The Description Logic Handbook: Theory, implementation, and applications*. Cambridge, England, United Kingdom. Cambridge University Press, 2003. <Fill in link here>
- Franz Baader, Ian Horrocks, and Ulrike Sattler. Chapter 3 Description Logics (http://www.comlab.ox.ac.uk/people/ian.horrocks/Publications/download/2007/BaHS07a.pdf). In Frank van Harmelen, Vladimir Lifschitz, and Bruce Porter, editors. Handbook of Knowledge Representation. Elsevier, 2007.
- Alexander Borgida. Description Logics in Data Management. In IEEE Transactions on Knowledge and Data Engineering. 11/1995; 7(5):671 - 682.
- Alan Rector, Nick Drummond, Matthew Horridge, Jeremy Rogers, Holger Knublauch, Robert Stevens, Hai Wang, Chris Wroe. OWL Pizzas: Practical Experience of Teaching OWL-DL: Common Errors & Common Patterns. EKAW 2004. http://www.co-ode.org/resources/papers/ekaw2004.pdf

Class 7 Reading Assignment

- HermiT: Birte Glimm, Ian Horrocks, Boris Motik, Giorgos Stoilos, and Zhe Wang. HermiT: An OWL 2 Reasoner. *Journal of Automated Reasoning*, 53(3):245-269, 2014. Available at http://www.cs.ox.ac.uk/people/ian.horrocks/Publications/download/2014/GHMSW14.pdf.
- Pellet: Evren Sirin and Bijan Parsia and Bernardo Cuenca Grau and Aditya Kalyanpur and Yarden Katz, Pellet: a practical owl-dl reasoner. Journal of Web Semantics. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwiR2uvG1-XSAhXEQyYKHfYbB8gQFggcMAA&url=http%3A%2F%2Fciteseerx.ist.psu.edu%2Fviewdoc%2Fdownload%3Fdoi%3D10.1.1.101.6784%26rep%3Drep1%26type%3Dpdf&usg=AFQjCNFwNGKCP-sRBUrGYaNvLorWsoZzqg&sig2=kxGThHi2bNhROS8gakIN
- TrOWL: Jeff Z. Pan, Edward Thomas, Yuan Ren and Stuart Taylor. Exploiting Tractable Fuzzy and Crisp Reasoning in Ontology Applications. In *IEEE Computational Intelligence Magazine*. 2012. Available at: http://homepages.abdn.ac.uk/jeff.z.pan/pages/download.php?type=p&ref=PTRT2012

Class 8 Reading Assignment

- Knowledge Graph: James P McCusker, John S. Erickson, Katherine Chastain, Sabbir Rashid, Rukmal Weerawarana, and Deborah L McGuinness. What is a Knowledge Graph, Currently under review for Semantic Web – Interoperability, Usability, Applicability, an *IOS Press Journal* Available at http://www.semantic-web-journal.net/content/what-knowledge-graph.
- KG for Science: Sören Auer, Viktor Kovtun, Manuel Prinz, Anna Kasprzik, and Markus Stocker. 2018. Towards a Knowledge Graph for Science: Invited Article. In *WIMS '18: 8th International Conference on Web Intelligence, Mining and Semantics, June 25–27, 2018, Novi Sad, Serbia*. ACM, New York, NY, USA, 6 pages. https://doi.org/10.1145/3227609.3227689,

https://test.repo.uni-hannover.de/bitstream/handle/123456789/3431/knowledge-graph-science.pdf?sequence=1

- Nanopublications: Tobias Kuhn, Albert Meroño-Peñuela, Alexander Malic, Jorrit H. Poelen, Allen H. Hurlbert, Emilio Centeno Ortiz, Laura I. Furlong, N'uria Queralt-Rosinach, Christine Chichester, Juan M. Banda, Egon L. Willighagen, Friederike Ehrhart, Chris T. A. Evelo, Tareq B. Malas, Michel Dumontier. Nanopublications: A Growing Resource of Provenance-Centric Scientific Linked Data. 2018. In *Proceedings of IEEE eScience 2018*. Available at https://arxiv.org/abs/1809.06532.

Class 9 Reading Assignment

- Semantic Web for the Working Ontologist (Allemang and Hendler), chapters 5 & 6. See above for references.
- Christina Unger, Lorenz Bühmann, Jens Lehmann, Axel-Cyrille Ngonga Ngomo, Daniel Gerber, Philipp Cimiano. Template-based Question Answering over RDF Data. In *Proceedings of the 21st World Wide Web Conference 2012, WWW 2012*, April 16–20, 2012, Lyon, France. Available at https://www.researchgate.net/publication/240615221_SPARQL_Template-Based_Question_Answering.

Class 10 Reading Assignment

- Timothy Lebo, Satya Sahoo, and Deborah McGuinness, editors. PROV-O: The PROV Ontology, W3C Recommendation, 30 April 2013. Available at http://www.w3.org/TR/prov-o/.
- Paolo Ciccarese, Stian Soiland-Reyes, Khalid Belhajjame, Alasdair JG Gray, Carole Goble, Tim Clark. PAV ontology: provenance, authoring and versioning. In *Journal of Biomedical Semantics,* December 2013, 4:37. Available at http://link.springer.com/article/10.1186%2F2041-1480-4-37/fulltext.html
- Zheng, J., Wang, P., Patton, E., Lebo, T., Luciano, J.S., and McGuinness, D.L. 2011. A Semantically-Enabled Provenance-Aware Water Quality Portal. In *Proceedings of EIM 2011* (September 28-29 2011, Santa Barbara, CA, USA).
- http://tw.rpi.edu/web/doc/eim2011_swqp
- Paolo Missier, Saumen Dey, Khalid Belhajjame, Víctor Cuevas-Vicenttín,and Bertram Ludäscher. D-PROV: Extending the PROV Provenance Model with Workflow Structure, In Proceedings, *6th Workshop on the Theory and Practice of Provenance* (TaPP 2013), April 2-3 2013, Lombard, IL, USA. Available at https://www.usenix.org/system/files/conference/tapp13/tapp13-final3.pdf.
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- Christopher Welty and William Anderson, Towards OntoClean 2.0 - A Framework for Rigidity, IBM Research Technical Report RC23754 (W0510-141), October 21, 2005, Available at http://domino.research.ibm.com/library/cyberdig.nsf/papers/0511B80E70CADF09852570A4004FBDA5/$File/rc23754.pdf. Note that you will need to accept the IBM research policy in order to access the page.
- María Poveda-Villalón, Mari Carmen Suárez-Figueroa, and Asunción Gómez-Pérez. Validating Ontologies with Oops!, In *Proceedings of the 18th International Conference on Knowledge Engineering and Knowledge Management*, EKAW 2012, Galway City, Ireland, October 8-12, 2012. Available at http://oa.upm.es/14384/1/mpovedaEtAlCameraReady.pdf
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- Fouad Zablith, Marta Sabou, Mathieu d’Aquin, Enrico Motta, Ontology Evolution with Evolva, In *The Semantic Web: Research and Applications, 6th European Semantic Web Conference, ESWC 2009*, Heraklion, Crete, Greece, May 31-June 4, 2009, Proceedings. Lecture Notes in Computer Science 5554, Springer 2009, pp. 908-912, 2009. Available at http://fouad.zablith.org/docs/ESWC2009Demo.pdf (related additional optional paper: http://oro.open.ac.uk/23525/1/fulltext.pdf)

- Boris Motik, Ulrike Sattler, and Rudi Studer. Query Answering for OWL-DL with Rules. In Sheila A. McIlraith, Dimitris Plexousakis, and Frank van Harmelen, editors, *Proceedings of the 3rd International Semantic Web Conference (ISWC 2004)*, Volume 3298 of LNCS, pages 549–563, Hiroshima, Japan, November 7–11 2004. Springer. Available at http://www.cs.ox.ac.uk/people/boris.motik/pubs/mss04dl-safe.pdf.

Class 12 Reading Assignment

- Semantic Web for the Working Ontologist (Allemang and Hendler), chapter 13. The book is available at Amazon.com, the RPI Library (check availability at library.rpi.edu),and an online preview is available Google Books: http://books.google.com/books?id=RnFjZTfPILcC&printsec=frontcover&cd=1&source=gbs_ViewAPI#v=onepage&q&f=false
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- Review static demo: http://inference-web.org/wiki/Semantic_Water_Quality_Portal

Class 13 Reading Assignment -- none

Optional additional resources

Liyang Yu. A Developer's Guide to the Semantic Web . Particularly Chapter 5.