FEEDS – Fall 2013
COT 6930- Semantic Web

Course Syllabus: Semantic web building blocks (standards, languages, ontology and logic). Open source tools. Integrated flow with our examples. Build an infrastructure to develop personal and practical Apps. Choose a research or an applied project. Open to majors in computer science and engineering (CSE), IT, operations management, Linguistics, and Mathematics.

Text book: 1. Hebeler, J., Fisher, M., et al., Semantic Web Programming, Wiley, 2009
References: 1. Marmanis, H., and Babenko, D., Algorithms of the Intelligent Web, Manning, 2009; 2. McCandless, M., et al., Lucene in Action, Manning, 2010; 3. Pease, A., Ontology, A Practical Guide, http://www.ontologyportal.org/ , 2012; and 4. Nolt, J., et al., Schaum's Outline of Logic, 2nd edition, 2011
Open Source tools: You may use a subset of these based on your project needs: Eclipse IDE, Java SDK, Protégé for Ontology, SIGMA for first order logic, SUMO ontology, Jena semantic web framework, Pellet Ontology reasoner, Lucene for information retrieval, etc.
Our Web Reference: http://semanticweb.fau.edu/ and slides at: http://csi.fau.edu/courses/semantic-web/
Prerequisites: Graduate or senior undergraduate student. Familiarity with Java, if you wish to write an App
Contact Info: Dr. Shankar, 513 EE, (561) 297-3470, Cell: (561) 306-5625, OH: F 10 AM to 4 PM
Course Time and Place: MW 3.30 Pm to 4.50 PM, CM 125 (FEEDS Studio)
Details: Semantic Web, aptly labeled Web 3.0 by many, offers a powerful approach to gain mastery over the multitude of information and information services. Mr. Tim Berners-Lee (TBL), the visionary behind the World Wide Web, has said that "… if properly designed, the Semantic Web can assist in the evolution of human knowledge as a whole." The Semantic Web is a strategic technology that truly provides a solution with significant efficiency and productivity advantages, and has lucrative opportunities. SEC's XBRL and TBL's Linked Data are large scale stories. Such Apps can help the user to sort through vast information resources available on the Web, and to secure relevant and focused information in a cost and time efficient manner. We will focus on Big Data, Health and/or Academics. The course will use an open source tool suite as the back bone to present an integrated flow. There are two types of limitations in building viable Apps today: (1) Most of the web is still optimized for human consumption, not for machine to machine interaction. So, any App developed has to incorporate intelligent web technologies, as practiced by many leading companies such as Google, Amazon, Netflix, and others. Those still are point solutions but are mature and can be integrated with our flow. (2) App developers do not have good foundation in logic theory and ontology. Thus, an App built is not built to last, and to scale easily and be integrated into bigger domains. A team of CSE and non-CSE majors, on the other hand, would bring complementary perspectives that can yield rich results. **Note:** The class lectures will cover both conceptual and practical aspects. Extra optional lectures will be taped; you may skip or watch them, depending upon your focus on programming or conceptual aspects. If you wish to learn it all, I am here to help you! On the other hand, teams of two with complementary strengths might be the best way to take full advantage of the class material. I will help you form teams. You can also work alone.

Course: (topics may be covered out of sequence)
Intro to Semantic Web: Build a semantic web App to gain exposure to standards and Jena (3 weeks)
Databases: Relational, XML, and Semantic (RDF, RDFS and OWL) approaches (3 weeks)
Ontologies and Knowledge Representation: SUMO, OWL and Protégé (3 weeks)
Project topics: Discussion and Definition (1 week)
Description Logic, Expressiveness and Decidability: SIGMA and RIF (optional lectures)
Intelligent Web: Algorithms for Search, Recommendation, Grouping & Classification (optional lectures)
Rules, Querying, and Reasoning: SPARQL and Pellet (3 weeks)

Grading:		
	Five Tool or Topic Assignments (choose):	40%
	Mid-term and Final Exam	30%
	Project (report, presentation and demo, with or without code):	20%
	Semantic web community service (develop a tool, review, blog, etc.)	10%