'MSC ON INFORMATICS ENGINEERING'

Department of Electrical Engineering and Computer Engineering

Hellenic Mediterranean University

Course title & identity

- Semantic Web
  - The Semantic Web is an evolving extension of the World Wide Web, in which the meaning of the information and the services on the web are defined.
  - Several enabling technologies has been developed to define standard specifications in the data exchanged on the Internet.

  Focus
  - Multimedia
  - Information Systems
  - Computer science
- Members of stuff
  - Dr. Nikos Papadakis
  - Laboratory Dr. Haridimos Kondylakis

Approach

- Three (3) hours lectures: (YES)
- Laboratory classes: (YES/NO)
  - Week by Week

- Assignments
  - 1 or 2 sets of exercises (atomic)   30%
- Project work(team) and presentation 70%
- Med-term assessment (NO)
- Final assessment (NO)

Specific details

- Introduction to SemanticTechnology of Semantic Web,XML,RDF – RDFS,OWL,Query Languages (xquery, RQL SERQL, SPARQL),Logic and Reasoning, Applications

- Assignments / projects
  - XML, RDF,RDF-SOWL-full,OWL-DL, Reasoners
  - Tools editx, Proteze, Jena
  - Indicate type of learning materials
    - Textbook

Γρηγόρης Αντωνίου & Frank van Harmelen "Εισαγωγή στον Σημασιολογικό Ιστό", Εκδόσεις Κλειδάριθμος 2009

Βουρός, Κώτης, Σπαντιδάκης, Ο Σημασιολογικός Ιστός για τους Δημιουργούς Οντολογιών, ΔΙΣΙΓΜΑ 2022

Michael C. Daconta , Leo J. Obrst , Kevin T. Smith "The Semantic Web: A Guide to the Future of XML, Web Services, and Knowledge Management", Amazon 2003

  - Research papers and Use manuals
    https://eclass.teicrete.gr/modules/link/link.php?course=TP253

Specific details

- Specify expected outcomes

The aim of this course is that students understand the representation and the process of knowledge in the Semantic Web.

- Detail any R&D project opportunities / relevance

Today's Web

- The World Wide Web has changed the way people communicate with each other and the way business is conducted

- Most of today's Web content is suitable for human consumption

- Typical uses of the Web today involve
  - humans seeking and consuming information
  - searching and getting in touch with other humans
  - reviewing the catalogs of online stores and ordering products
  - viewing adult material

Search Engines

- Keyword-based search engines, such as Google and Yahoo, are the main tool for using today's Web
- However there are serious problems associated with their use
  - High recall, low precision
  - Low or no recall
  - Results highly sensitive to vocabulary
  - Results are single Web pages
- But even if a search is successful, it is the human who has to browse selected retrieved documents to extract the information he is actually looking for
- The main obstacle for providing a better support to Web users is that, at present, the meaning of Web content is not *machine accessible*
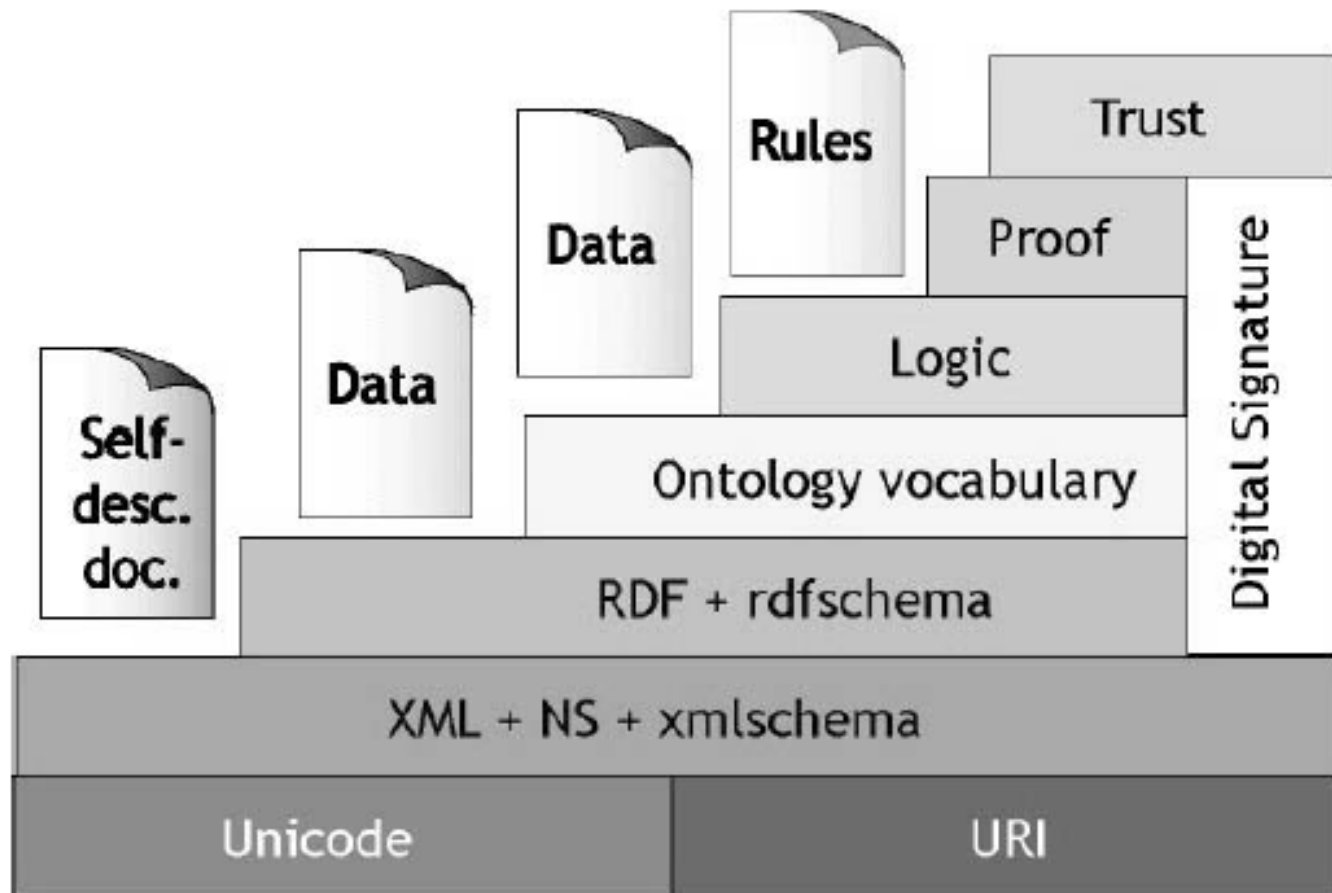
It is simply difficult to distinguish the meaning of
I am a professor of computer science . . .
from
I am a professor of computer science, you may think. Well, . . .

The Semantic Web (SW) Initiative

- The question is how the current situation can be improved
  - One solution is to use the content as it is represented today, and to develop increasingly sophisticated techniques based on *artificial intelligence* and *computational linguistics*
    - This approach still appears too ambitious
  - An alternative approach is to represent Web content in a form that is more easily machine processable, and to use intelligent techniques to take advantage of these representations.
    - We refer to this plan of revolutionizing the Web as *the Semantic Web initiative*
- The Semantic Web is propagated by the World Wide Web Consortium (W3C), an international standardization body for the Web

The "layer cake" of the SW

Applicant profile

- Pre-requisites
    - Basic knowledge of Programming
    - Basic knowledge of DB
    - Basic Knowledge of logic
- Skills
    - Basic web programming
    - Basic java programming
- Expected weekly workload
    - Apart from the 4 course hours an extra 4-6 hours are anticipated depending on the background of the student.
    - Workload is expected to reach its peak at the period when students are to implemented their projects.