

Program	
MO826 / MC936 - Information System Topics Institute of Computing University of Campinas	1° semester / 2015 Professor: André Santanchè

Schedule

Monday and Wednesday: 16:00 until 18:00 (classroom 351 - IC 3.5)

Summary

This discipline focuses on the subjects: Web and Semantic Web. Web subject: Web science and Web engineering; architecture, models, standards and languages; querying; social Web and social networks; crowdsourcing; content, behavioral and graph analysis; information extraction, mining, searching, matching, entity resolution and Deep Web; Web platform and applications; Web for mobiles; Web services; Web of Things. Semantic Web subject: architecture, models, standards and languages; Web of data, metadata, querying, rules and reasoning; Linked Data, data spaces and data integration; knowledge representation, formalisms and ontologies; semantic Web services.

Program

- **Web Engineering**
 - Architecture
 - Models, standards and languages
 - URL, URN, URI and IRI
 - HTML and XML
 - XPath and XLink
 - Database perspective
 - Querying and XQuery
 - Web platform and applications
 - Web for mobiles
 - Web services
 - Web of Things
 - Linked data
 - Data spaces and data integration
 - Semantic Web
 - Architecture
 - Models, standards and languages
 - RDF and OWL
 - Web of data and metadata
 - Querying and SPARQL
 - Rules, reasoning and SWRL
 - Ontologies
 - Knowledge representation
 - Ontology spectrum
 - Controlled vocabularies
 - Taxonomies
 - Thesaurus
 - Semantic Web Services
- **Data Science**
 - “Digging” the Web
 - Information extraction

- Mining
- Searching
- Matching
- Entity resolution
- Deep Web
- Fourth Paradigm
- Web Observatory
- **Web Social Science**
 - Folksonomies and emergent social structures
 - Crowdsourcing
 - Content, Behavioral and Graph analysis
 - Link and tag analysis
 - Link prediction
 - Sentiment analysis
- **Network Science**
 - Complex Networks
 - Scale-Free Property
 - Small-world Network
 - Graph topology and Metrics

Evaluation Criteria

The course has two main projects:

- 1^a project
 - presentations starting - 11/03/2015
 - deadline article - 15/04/2015
- 2^a project
 - presentations starting - 01/06/2015
 - deadline article - 01/06/2015

The projects specification will be delivered in specific documents during the course.

Average :

$$\text{final} = (\text{project}_1 + \text{project}_2) / 2$$

Concepts mapping:

- A → final $\geq 8,5$
- B → $8,5 > \text{final} \geq 7$
- C → $7 > \text{final} \geq 5$
- D → final < 5

Final exam - only for undergraduate students:

- Date: 13/07/2015
- In this case the final grade will be calculated as follows:
 - $\text{final}_{\text{exam}} = (\text{final} + \text{grade}_{\text{exam}}) / 2$

Bibliography

Books

- Berners-Lee, T., Hall, W., Hendler, J. A., O'Hara, K., Shadbolt, N., & Weitzner, D. J. (2006). A Framework for Web Science. Hanover, MA, USA: Now Publishers Inc.
- Barabási, A. (2012) Network Science. Online: <http://barabasilab.neu.edu/networksciencebook/>
- Staab, S., & Studer, R. (2009). Handbook on Ontologies (2nd ed.). Springer Publishing Company, Incorporated. Doi: 10.1007/978-3-540-92673-3.
- Breitman, K. (2005). Web Semântica: a Internet do Futuro. Editora LTC.

Readings

- Hendler, J., Shadbolt, N., Hall, W., Berners-Lee, T., & Weitzner, D. (2008). Web science: an interdisciplinary approach to understanding the web. *Commun. ACM*, 51(7), 60-69. doi:10.1145/1364782.1364798
- Shneiderman, B. (2007). Web science: a provocative invitation to computer science. *Commun. ACM*, 50(6), 25-27. doi:10.1145/1247001.1247022
- Gruber, T. R. (1993). A translation approach to portable ontology specifications. *Knowledge Acquisition*, 5(2), 199-220. Academic Press Ltd.
- Berners-Lee, T., Hendler, J., & Lassila, O. (2001). The Semantic Web. *Scientific American*, 284(5), 28-37.
- Smith, B., & Welty, C. (2001). FOIS introduction: Ontology---towards a new synthesis. *Proceedings of the international conference on Formal Ontology in Information Systems - Volume 2001* (pp. 3-9). New York, NY, USA: ACM. doi: <http://doi.acm.org/10.1145/505168.505201>.
- Guarino, N. (1997). Understanding, building and using ontologies. *Int. J. Hum.-Comput. Stud.*, 46(2-3), 293-310. Duluth, MN, USA: Academic Press, Inc. doi: <http://dx.doi.org/10.1006/ijhc.1996.0091>.
- Uschold, M., & Gruninger, M. (1996). *Ontologies: Principles, Methods and Applications*. *Knowledge Engineering Review*, 11(2), 93-136.
- Cullot, N., Parent, C., Spaccapietra, S., & Vangenot, C. (2003). Ontologies: A contribution to the DL/DB debate. *Proc. of the 1st International Workshop on the Semantic Web and Databases, 29th International Conf. on Very Large Data Bases* (pp. 109-129).
- Noy, N. F., & McGuinness, D. L. (n.d.). *Ontology Development 101: A Guide to Creating Your First Ontology*. Retrieved from http://protege.stanford.edu/publications/ontology_development/ontology101.html.