Knowledge Representation and Ontology

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Online Course, in English

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Course Description and Objective

Knowledge representation (KR) is the study of how knowledge about the world can be represented in a computer system and what kinds of reasoning can be done with that knowledge. Also, there is a consensus nowadays that the WWW has profound impact on the way people communicate with each other, how information is disseminated and accessed, and how business is carried out. On the other hand, most of Web content is for human consumption, limiting machine processing. As an answer for this problem, it has been pursued to establish a Semantic Web in which meanings are made explicit in order machines can process and integrate web resources.

This introductory course named *Knowledge Representation and Ontology* will provide an overview of the concepts of knowledge representation, logics, ontologies and some semantic web technologies that have been used in many domains for representing knowledge and inferencing on it.

The expected outcome of the course is that attendees be able to grasp the general notions presented and be able to identify what and how they could exploit and deepen their knowledge to pursue the development of application in their field of interest.

Course Content

1. Knowledge Representation Notion

2. Introduction to Propositional and First Order Logic

3. Ontology Concept

4. Overview of the Basic Formal Ontology (BFO)

5. Introduction to Web Ontology Language (OWL) to Represent Ontologies

6. Inferences

7. Discussions on Applications

Course Pre-requisites

1. Fundamentals of Mathematics

Bibliography

1. ALLEMANG, Dean; HENDLER, Jim. **Semantic Web for the Working Ontologist**. Boston: Morgan Kaufmann, 2011.

2. ANTONIOU, Grigoris; van HARMELEN, Frank. **A Semantic Web Primer**. Cambridge: MIT Press, 2008.

3. BERNERS-LEE, T.; HENDLER, J.; LASSILA, O. **The Semantic Web**. Scientific American, May. 2001, p. 34-43.

4. BRACHMAN, R. J.; LEVESQUE, H. J. **Knowledge Representation and Reasoning.** San Francisco: Morgan Kaufmann, 2011.

5. RUSSEL, S.; NORVIG, P. Inteligência Artificial. São Paulo: Campus, 2013. 3ed.

Lecture Schedule – 5 weeks starting at the last week of May.

Date	Topics
Day 1	Knowledge Representation Notion
Day 2	Introduction to Propositional and First Order Logic
Day 3	Ontology Concept; Overview of the Basic Formal Ontology (BFO)
Day 4	Introduction to Web Ontology Language (OWL)
Day 5	Inferences; Discussions on Applications

Admission Process

Candidates for the course should send me an email stating the reasons for attending the course and attach a CV to the message. The candidates will be selected on the basis of the information they provide.