CS551 Approaches to Semantic Web

Course Outline

This course is designed to provide a rigorous understanding of the different approaches to Semantic Web and their applications in related fields of study. The course is intended for M.Tech and B.Tech students with basic background in mathematical logic, set theory, and statistics. The course will be conducted in the tentative order as listed below:

- Historical development of the area (1 lecture)
- Topics of Interest in the area (1 lecture)
  - Ontology Matching
  - Ontology Alignment
  - Ontology Merging
  - Ontology Generation
  - Ontology Design & Engineering
  - Reasoning Optimization
  - Semantic Web Search Engine
  - Semantic Web Service Composition
  - Semantic Web Mining
- The controversial aspect (1 lecture)
- Overview of two widely adopted approaches (2 lectures)
  - Statistical Reasoning based
  - Mathematical (Logical) Reasoning based
- Mathematical Approach
  - Mathematical Foundation (4 lectures)
    - Description Logics
    - Ontology as Knowledge base
  - Mark-up Languages for Knowledge Representation and Reasoning (4 lectures)
    - RDF
    - RDFS
    - OWL
    - SPARQL
- SWRL
  - Reasoners (2 lectures)
    - PELLET
    - FACT
      - Ontology Matching (4 lectures)
- Statistical Approach (6 lectures)
  - Relation Extraction
  - Entity Classification
  - Semantic Network Generation
  - Ontology Matching
- Ontology Engineering using Protégé
- Lab assignments – 10%
- Paper reading & critique writing
- Examination
  - Paper Presentation – 10%
  - Mid-term – 40%
  - Final – 40%