Ontology Summit 2010: Training Future Ontologists

Content Track

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Content Track Mission

- The track mission is to provide a course or courses of content required for both professional and academic ontologist training
- We will initially focus on a breadth-first description
- We are intent on identifying modules of knowledge/courses that are focused on competencies expected for ontologist education
  - That could be addressed at different levels of certification/accreditation, with some optional and some required at each level.
  - Example levels: associate degree (undergraduate 2 years), undergraduate degree (undergraduate 4 years), terminal professional master's degree (graduate), pre-PhD master's degree (graduate), professional non-academic certification
- The Content track necessarily correlates with the other tracks, with the Quality (accreditation/certification) track's recommendations, with the cross-cutting/horizontal present and future required competencies/requirements/survey for the occupation of ontologist, etc.

Content Track Questions

- Organizational questions
  - Should we have a separate dedicated distribution list for the Content track?
  - Should we have a common distribution list for the Ontology Summit, with annotated headers for [CONTENT]?
  - Should we have a distinct wiki page? Who can contribute? Should contributions be reviewed prior to posting?
- Substantive questions:
  - What are the content topics (knowledge and skills), i.e., the competencies, necessary for training and educating an ontologist?
  - What does an ontologist need to learn and in what order?
  - What are the content topics useful or optionally desired for training and educating an ontologist?
  - Is there a spectrum of ontologist positions (e.g., from taxonomist to developer of logical theories) and if so, what is the content and competencies required for each?

Academic vs. Professional Courses

- ## Academic
  - Undergraduate
    - Associate Degree (2 yr)
    - Bachelor's Degree (4 yr)
  - Graduate
    - Master's Degree: Academic, pre-PhD
    - Master's Degree: Professional, terminal degree

- ## Professional
  - Basic
  - Intermediate
  - Advanced

Modules

- ## Formal Foundations of Ontological Engineering
  - Mathematics and Computer Science: Set theory, category theory, formal languages, formal machines, data models
  - Logic: Formal Logic, syntax and semantics
  - Semantics: Formal Semantics, Philosophy of Language
  - Ontology: Formal Ontology

- ## Knowledge Representation Languages
  - FOL: Logic Programming (Prolog, Datalog, Answer Set Programming, etc.)
  - FOL: Common Logic, Integrated Knowledge Representation for Intelligence Systems (IKRIS) Knowledge Language (IKL)
  - Description Logics and Semantic Web: OWL/RDF, SWRL, RIF, Description Logic Programming
  - Other: CycL/MELD, Conceptual Graphs, KIF/OKBC, etc.

Modules

- ## Ontological Engineering
  - Origin and history of ontological engineering
  - Issues and problems
    - Entities, Events, Processes
    - Parts
  - Foundational ontologies: upper, utility, reference
  - Middle, domain, and application ontologies
  - Use Cases, competency questions, requirements
  - Architectures and Methodologies: Analysis, Design, Implementation
  - Mapping ontologies and linking to data/knowledge instance bases
  - Automated reasoning, rules, proof: deductive, inductive, abductive, probabilistic, etc.
  - Registries and repositories

Modules

- ## Ontological Engineering (continued)
  - Tools
    - Ontology development environments: Protégé, TopBraid, OntologyWorks, etc.
    - Ontology/rule reasoning engines: Pellet, RacerPro, Pellet, SILK, Prolog, OntologyWorks, FOL Theorem-Provers: Prover9, Vampire, etc.
    - Ontology mapping (matching, alignment, merging) tools
    - Ontology quality tools: OntoClean, etc

Modules

- **Semantic Web**
  - Languages
    - XML, XML Schema
    - RDF, RDF Schema
    - OWL 1, OWL 2
    - SWRL
    - RIF
    - SPARQL
    - Other: GRDDL, micro-formats, etc.
  - Tools
    - Triple Stores: Oracle Spatial/11g, AllegroGraph, OWLIM, Sesame, etc.
    - Relational database to RDF linking
    - Semantic Wikis
    - Reasoners