

CSCI586 PROJECTS – Spring 2012

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Below are possible projects for CSCI586, spring 2012. Each student is to choose one of these group projects; alternatively a group may be formed and propose it's own project, which must be connected to the subjects of the course (this is a "type 3 project" – please see below).

There will be two to four students (three is recommended) in each project group. A written report plus material developed in the project is to be submitted at the end of the semester, along with the powerpoint slides from the group's final in-class presentation (all final project material is due the day of the last meeting of the course). Groups will also be asked for a mid-semester brief progress report.

The project final written report should be done as a technical conference paper. If successful, groups may get a publication from their work. (The authors of the paper would include the group members).

In sum, there are three types of projects: type 1, type 2, and type 3 – a project your group proposes and defines. There may be more than one group on a given project topic.

Type 1 Projects (P1 – P4)

The goal of this project type is to develop and apply a federated ontology in the area of specific application domain. About three or four aspects of the domain should be considered, each with it's own ontology. To construct the ontologies, the Protégé ontology manager can be used. Alternatively, there are other possible ontology tools that can be used – a group can propose to select an alternative to Protégé).

A "meta ontology" is then to be created to cross-correlate the ontologies constructed. This meta ontology can be constructed in Protégé or using another tool. A principal contribution of your work will be to formulate what the meta ontology contains, and how rich it is in terms of describing the inter-ontology relationships. In class, we address several ontology cross-correlation approaches – these and others that you find in the "literature" or existing systems can be used. At the end of the project, there should be a candidate federated ontology that can serve as an informational "guide" for users to

understand the domain. This exploration can be done with Protégé (or other ontology tool), and a basic user interface you will construct (appropriate for the domain).

The possible domains are:

- The QuakeSim project (earthquake science data) [P1]
- USC Semantic Information Research Lab – “semantic guide” [P2]
- Interdisciplinary Research Guide for the USC Viterbi School of Engineering [P3]
- <your choice> (topic must be approved) [P4]

Type 2 Projects (P5 – P8)

The goal of this type of project is to study, experiment with, analyze and explore the practical use of a successful “large” ontology (or collection of ontologies). How was the ontology developed? How can it evolve? What level of semantics is captured in the ontology? How is it used? Why is this ontology successful, and how? What can we learn from this in developing other domain ontologies? What has been accomplished with this ontology? What problems have been encountered?

In the project, you explore the questions and issues above, and produce an analytical report; this is in a sense a “case study”. If successful, the report can be submitted for publication in an appropriate forum.

- *The Gene Ontology* [P5]
- Semantic Web for Earth and Environmental Technology (SWEET Ontologies) [P6]
- *The Oncology Ontology* [P7]
- <your choice> (topic must be approved) [P8]

Type 3 Projects (P9)

A group may be formed and propose it’s own project, which must be directly connected to the subjects of the course.