LINKÖPINGS UNIVERSITET
Institutionen för datavetenskap
Patrick Lambrix

Exam
Ontologies and Ontology Engineering
2011

Comments:

- This is an *individual* exam. If you have questions, ask the course leader.

- Send your answers to: Patrick Lambrix, Institutionen för datavetenskap, Linköpings universitet, 581 83 Linköping.

- Deadline: August 31, 2011.

- Write a contact phone number on your hand-in. I will phone you in case there are questions regarding your answers.

- If there are references to papers in the questions, then links to the papers will be on the course home page.

- For the discussion questions, I have added how many pages the answer should be. This is a guideline which shows you the relative length of the different answers.

- Amount of work: ca 40 hours

- As this is a PhD course, for a pass grade, I require answers to all questions and almost all answers need to be correct.

Good luck!

Question 1: Protégé

See course home page under 'Examination' - Take Home exam

Question 2: Description Logics

Define the following concepts using description logics:

C1: animals that have at least 4 legs and all foods they eat are wheat plants
C2: animals that have at least 2 legs and all foods they eat are plants

Does C2 subsume C1, i.e. C1 isa C2? Prove your answer using a tableau algorithm. (Use the Baader, Nutt chapter.)

Question 3: Ontology Alignment

See course home page under 'Examination' - Take Home exam

Question 4: Ontology Debugging

Given the following axioms in an ontology: $A \sqsubseteq B$; $A \sqsubseteq E$; $B \sqsubseteq C$; $B \sqsubseteq D$; $C \sqsubseteq F$; $D \sqsubseteq F$; $F \sqsubseteq G$; $E \sqsubseteq G$; $A \sqsubseteq \neg G$.

Debug the ontology. Compute MIPS and MUPS.

Question 5: Visualization and Ontologies

Choose 3 visualization techniques from the (Katifori et al, 2007) survey paper and discuss advantages and disadvantages related to (i) visualization of a single ontology, (ii) ontology alignment, including visualization of the ontologies, the mappings and the mapping suggestions, (iii) semantic ontology debugging, including visualization of the ontologies, the unsatisfiable concepts as well as suggestions for repairing the ontology. (2 pages)

Question 6: Applications

Choose an application and show how ontologies are used and improve the performance. (You can take an article from the reading list or find your own.) Discuss the properties of the ontology and which parts/components were essential for the application. Was an existing ontology used or was a new ontology created? Why? What were the requirements for the ontology? Discuss the improvements for the application. Did the application have increased functionality by using the ontology? (1-2 pages)