

CPSC 522 — Spring 2012

Assignment 2

Due: 12:30 p.m., Friday 27 January 2012.

This assignment is to consider how AI can be used to solve parts of the wastewater treatment problem presented by Brent in the class on January 18. Brent will be available in the classes on Jan 20 and 25 to answer questions about the domain, and can answer questions on WebCT Vista. We do not expect that you will be able to do this assignment without consulting some of the literature on AI and wastewater treatment, but you also won't be able to answer it just from the literature (some creativity will be required).

For this assignment, we are asking you to be conceptual and think creatively. You are not expected to understand the wastewater literature or even the components of a waste water system in detail. We want to see how well you can communicate technical AI concepts to a domain outside of computer science. We also want to see if you can imagine how to apply what you are learning and have learned to a real-world problem.

You are encouraged to work together as much as possible, and to post questions and answers on the WebCT Vista course discussion pages

(<https://www.vista.ubc.ca/webct/logon/8594049560181>).

The slides from Brent's presentation are available from

<http://cs.ubc.ca/~poole/cs522/2012/WWPresentationSlides.pdf>.

The compendium referred to in Brent's talk is available from:

http://www.eawag.ch/forschung/sandec/publikationen/compendium_e/index_EN.

Question 1

Suppose you are working with an interdisciplinary team of researchers on a wastewater (WW) decision-support project. Your job is to write a section of a grant that specifies how AI technology could be used to address one of the components of the wastewater treatment decision support system presented.

In particular, your job is to write up an “Example” section of a grant that includes a specific example of how an AI technology could be used for one aspect of the wastewater treatment problem. You will need to give context by explaining the problem and what the AI technology can do to improve the WW decision support process. Your description should be comprehensible by both CS and wastewater experts. The example should be simple, yet concrete enough so that the reader can imagine how it will work. It should be written so that one can see how it could be extended into part of a complex system. You have 200-300 words to provide a written statement of your idea.

Note: This is the big picture, non-technical explanation. You are aiming to intrigue your readers and make sure that they understand the benefits of your proposal.

Some suggested examples include:

- Define part of an ontology for wastewater treatment
- Show how individual components can fit together to achieve some goal (showing what can possibly fit together and what is feasible to achieve a goal)
- Show how high level modules can be put together to create a system.
- Show how preference elicitation techniques can be used to determine the best configuration of components from a set of feasible configurations.

Question 2

In 100-200 words of text, you must add to the literature review section of the grant. You are to find 2-3 examples from literature that are relevant to the task in question 1. Explain how the work found in your sources is relevant to your idea and its application to the WW decision support system. We need both the paragraph and the references. You should try to find at least one CS reference and one from the literature related to the problem.

Note: Keep this simple. Synthesize each of the literature examples into a sentence or two, and follow it up with a sentence of how it is relevant to your idea in question 1.

Question 3

How long did the assignment take? What did you learn? Was it reasonable? What suggestions do you have to improve the assignment?