MoSS Coursework 1, 2024/25

23 September 2024

Submission deadline: See Coursework Planner in Learn
Weight: 50% of the course mark.

Relationship to Learning Outcomes

This coursework is meant to assess Learning outcomes 1, 2, 3, and 4 (partly), which are:

> 1) Explain how computational modelling frameworks can be used to understand the behaviours of complex interacting systems involved in sustainability such as social, economic and ecological systems

> 2) Investigate a sustainability system question, identify system elements and their interactions, and codify a system model using an appropriate model description framework

> 3) Critique and interpret the results / output of models of sustainability systems

> 4) Communicate findings of sustainability modelling studies, including uncertainty, to a variety of audiences [including non-technical policymakers, the general public and peers]

Instructions

1. Choose a scientific paper about a system related to sustainability that used an Agent-Based Model or Systems Dynamics Model, but that did not describe the model using the Overview, Design Decisions, Details (ODD) protocol. There is a list of suggested publications in the document **Suggested-papers-for-CW1.pdf** in the CW1 folder. You can also select a different paper you have identified, subject to approval by the course organisers – if you choose to do this, the deadline for notifying the course organisers is Monday of Week 3 – 30 September 2024. One way of finding other papers is to find a paper using the Suggested-papers document, and then search for papers that have cited it using Google Scholar or Web of Knowledge.
2. Write the ODD protocol for your chosen paper. [20% of course weight, estimated time 10 hours.] If the information required to complete sections of the ODD is not present in the paper, state that this is the case, and fill in information that makes sense, justifying it in the context of the paper. Guideline length:
    a. EITHER up to 1000 words overall
    b. OR a limit of 800 words on the Overview and Design Concepts sections combined, and no limit on the Details. However, in the Details section, please use headings to separate out the submodels.
3. Write a 750-word article in the style of a popular science magazine (e.g. New Scientist or Scientific American). [30% of course weight, estimated time 10 hours]
    The article should address the following three objectives, and should include a suggested headline:
    a. explain how computational modelling methods can be used to address problems of systems related to sustainability.
    b. explain how those are applied in the case of a particular sustainability systems modelling paper you chose in Step 1, and for which you have written the ODD.

     c.   Critique shortcomings of the paper chosen in Step 1, for example, examining if the conclusions of the paper are supported by the modelling, if the modelling approach is appropriate for the question address or if there is other work in the field that appears to contradict (or support) the findings of the paper.

Assessment criteria

The work will be marked using a grid-based rubric with the following criteria:

ODD

- Overall, the ODD should be clear enough that it would be possible to start implementing the model having read it
- Purpose & Patterns: There is a clear statement of the purpose of the model and the patterns that the system is supposed to model
- Entities, State Variables and Scales: Entities, State Variables and Scales are all identified and described clearly. In the case of a system dynamics models, entities and state variables may be identical or very similar, so we will take this into account.
- Design concepts: Design concepts identified and described correctly.
- Process overview, scheduling and submodels: Processes and scheduling identified, with details of submodels described in a separate section.

Critique article

- Explanation of computational modelling: In the popular science article, a clear explanation of how computational modelling can contribute to understanding of sustainable systems in general
- Suitability for general audience: Explanation of your chosen scientific study suitable for a general audience
- Critique: Valid and insightful critique of the study
- Overall impact of your critique article