Introduction to Agent-Based Modeling

Fall 2023

Final Project: Topic Review and Selection

This form will guide you and your group through some topic brainstorming. Then, it’ll have you do a brief review of existing work in the field.

1. Name/Group Member Names. For those of you in groups, feel free to come up with a cool team name here as well.

YOUR ANSWER HERE

1. In the space below, brainstorm a few general areas of interest that you may want to explore in your final project.

*Note: If you’re still looking for ideas, you may find a few interesting ones at the resources listed in Problem 7 of this form.*

YOUR ANSWER HERE

1. Your model should be designed to help you gain insight on a question. Posing specific and reasonable questions is a crucial aspect of the modeling process. Here are two examples of valid question formats, though there are an infinite number:

* “How does \_\_\_\_ affect \_\_\_\_?”
* “What are the important factors in the development of \_\_\_\_?”

Use the space below to workshop a few questions. Include at least two of them here. The goal of your final project will be to use an agent-based model as a preliminary method of investigating one of these questions.

YOUR ANSWER HERE

*For the following problems,* ***choose one of the questions*** *from Problem 3 as an example to work with. If you decide to change to a different question or topic later, that’s fine! You are not obligated to use the sources that you find here.*

1. Give an overview of your question’s general topic/field, and state how your question fits into the topic/field more broadly.

YOUR ANSWER HERE

1. Why do you think asking and studying this question is worthwhile?

YOUR ANSWER HERE

1. Do some information gathering related to your question, and list at least two preliminary sources below. Explain why you chose these sources and how they help you think about your question.

*Note that these sources are not required to be formal academic publications (for example, a YouTube video or a blog post is okay)*

YOUR ANSWER HERE

1. Have researchers attempted to address your question in the past? If so, what was their methodology (experimental, computational, or theoretical)? If not, what similar questions have researchers attempted to address in the past, and what was their methodology?

YOUR ANSWER HERE

1. See if you can find one or a few existing agent-based (or mathematical) models relating to your question. The models you find in your search need not be written in Python. Here are some resources that you may find helpful:

* [CoMSES Computational Model Library](https://www.comses.net/codebases/)
* [NetLogo Models Library](https://ccl.northwestern.edu/netlogo/models/)
* [PyCX Python Model Library](https://epimath.org/cscs-530-materials/Lectures/PyCX_Intro.html#1)

If you can’t find an existing model that relates to your question, find a relevant or interesting one in the question’s broader field. Link the models you found below.

YOUR ANSWER HERE

1. Choose one of the models you found in Problem 8. What process is this model attempting to capture? Describe this process.

YOUR ANSWER HERE

1. How does the model you chose in Problem 9 work? If there are agents, what do the agents represent? What quantities (outputs/dependent variables) are present in the model and what do they represent? What parameters (inputs/independent variables) exist in the model and what do they represent?

YOUR ANSWER HERE

1. Do you think the model you chose in Problem 9 is successful in capturing the process? Name one aspect that the model captures well and one limitation of the model.

YOUR ANSWER HERE

1. Now that you’ve gotten a chance to familiarize yourself with your question’s field and broader context, as well as look at existing sources and models, what are some ideas you have to make your project unique compared with existing work?

YOUR ANSWER HERE