



OCTOBER 15, 2024

# MODEL AGENTS: SOCIAL BEHAVIOR THROUGH THE FORMAL LENS

# LOGISTICS

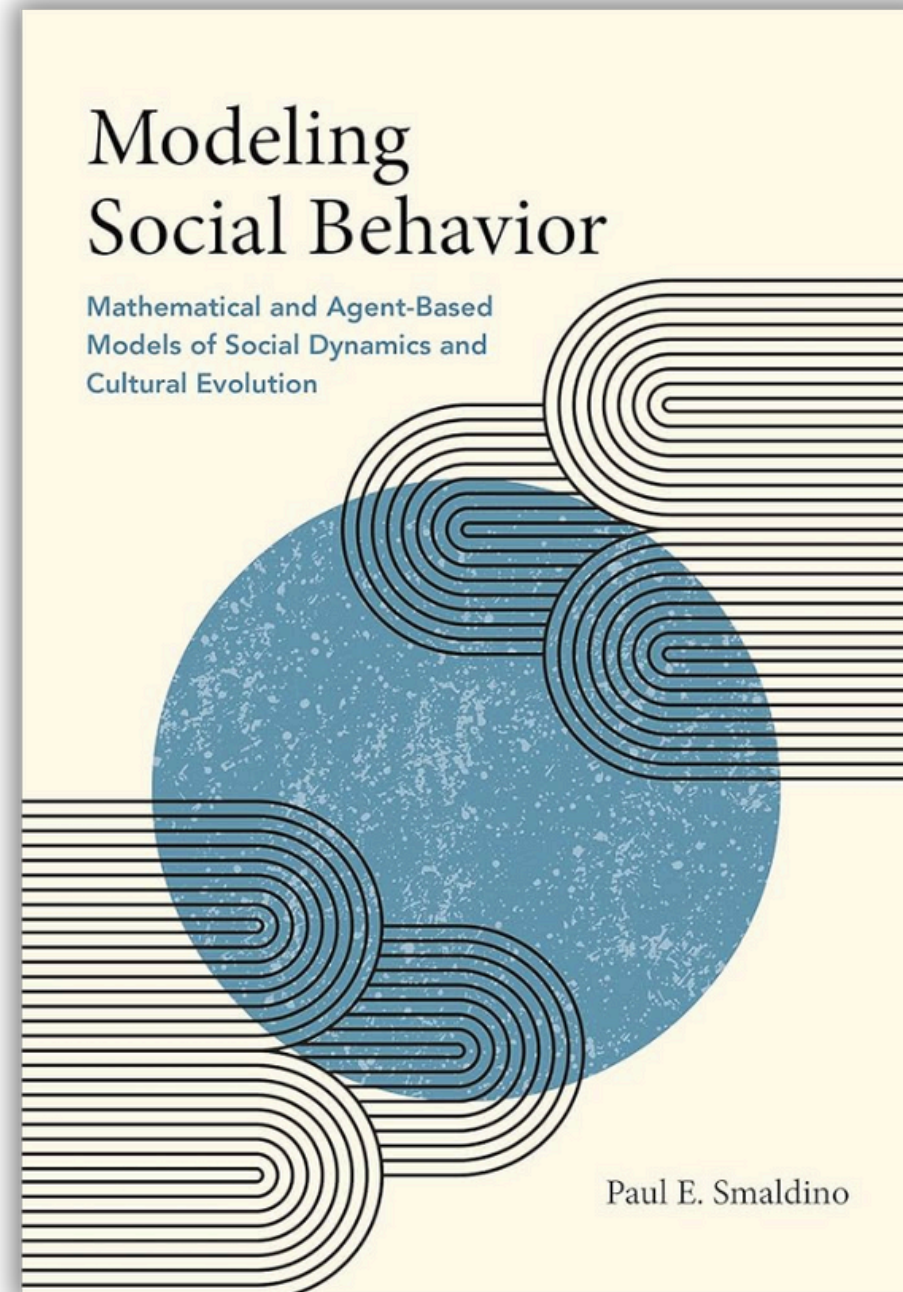
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# PITCH

The course will offer a dive into the most prominent models for studying social behavior. As the saying goes, such models are wrong (i.e., simplifications of reality), but remarkably useful. We will study ways to model segregation, the spread of an idea, the dynamics of beliefs and opinions, the emergence of cooperation and coordination.

The course will mainly follow Paul Smaldino's recent book *Modeling Social Behavior*, and will consist of weekly discussions around each chapter. The book doubles as an introduction to agent-based modeling, but no coding experience is needed, or assumed, for the course. Our primary focus will be the models themselves and what they tell us about reality.

TEXTBOOK



Modeling Social Behavior: Mathematical and Agent-Based Models of Social Dynamics and Cultural Evolution

PAUL E. SMALDINO

Princeton University Press

2023

# AIMS

## **SINK YOUR TEETH INTO THIS FASCINATING TOPIC**

Very interdisciplinary topic, with broad reach.

## **UNDERSTANDING OF MODELS IN SCIENCE**

Models are an important tool for science. Maybe even the most important?

What do they tell us about reality?

# FORMAL COMPONENT

## **NETLOGO**

Framework for programming agent-based models.

Intuitive, with extensive library of models.

But not a pre-requisite, or main focus, for the class!

## **MATH**

A bit mathy, sorry.

Algebra, some probabilities, not-quite-calculus.

Shouldn't be too bad, but have a look through the book.

Either way, we will try to be as intuitive as possible!

# FORMAT

## **FORMAT**

In-person, on campus, 2hrs each.

45 mins + 5/10 mins break (to ask questions, take naps) + 45 mins.

Any slides will be posted online after the sessions.\*

Discussions based on main text(s).

Potentially, these can be led by students.

\* <https://adrianharet.github.io/model-agents>

## **SCHEDULE**

One lecture per week

Tuesday, 18:00 - 20:00, Room 021 (here!)

## **FIRST LECTURE**

October 15, 2024 (now!)

## **NO LECTURE**

December 24, 2024 (Christmas)

## **LAST LECTURE**

February 4, 2025

# EVALUATION

## **GRADE**

Four elements, which can be either of:

- small essay (3-5 pages)
- oral presentation of one of the texts discussed
- implementation/simulation of some of the ideas

These can be mixed any which way is more convenient, e.g., a 6-10 page essay instead of two smaller essays.

Ideal: one oral presentation, one mid-term summary, one final essay (= 2 smaller essays).

Essays can be:

- research on some topic that caught your interest
- review of relevant literature, e.g., a paper
- tackling a research question
- coding up something (a simulation) and reporting the results

# ETIQUETTE

## **PERSONAL WORK**

Don't plagiarize, etc.

## **RESPECT TOWARDS PEERS**

Please.

## **QUESTIONS DURING LECTURES**

Yes!

Feel free to interrupt and ask.



Now let's get to know each other.

# ABOUT ME



## ADRIAN HARET

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# ABOUT ME

Background in Philosophy, at the University of Bucharest.

Switched to Computer Science, with a PhD in the logic of belief change at TU Wien.

Followed by Postdoc in Computational Social Choice at the University of Amsterdam.

Write to me!

Or drop by, I'm in office 032.

**Your turn!**