

# SYMPOSIUM ON EMPIRICALLY- CALIBRATED AGENT- BASED MODELS FOR MECHANISM-BASED RESEARCH

December 11, 2024  
IAST, Toulouse



Institute for  
Advanced  
Study in  
Toulouse



Toulouse  
School of  
Economics



UNIVERSITÉ  
TOULOUSE  
CAPITOLE



Photo by Louis Paulina

**Location:** Toulouse School of Economics, Auditorium 3

## PROGRAM

09:00 coffee and registration

### Keynote

09:30 welcome words

09:40 **Peter HEDSTRÖM** *Institute for Analytical Sociology*

### Generating the Social

In this talk I discuss the role that agent-based simulations play in explanations of macro-level outcomes. I argue that it is essential to make a clear distinction between abstract types of outcomes and concrete token outcomes since the adequacy of a proposed explanation depends significantly on whether the outcome to be explained is abstract or concrete. While an adequate explanation of an abstract type of outcome must show how the type of outcome can, in principle, be brought about, an explanation of a concrete token outcome must demonstrate how the outcome was actually brought about in the specific case at hand.

This suggests that our theory-related work takes two main forms:

(1) We develop abstract theoretical models that demonstrate how various types of outcomes can be brought about.

(2) We use these abstract models to explain and gain insights into token outcomes observed in the real world.

How an abstract theoretical model can be said to explain a token, real-world outcome raises many difficult questions. Here I will outline a gradual tokenization strategy as a way of assessing the explanatory relevance of an abstract theoretical model. This strategy reduces the gap between the abstract model and reality by tokenizing the abstract model, so it more closely mirrors the social setting under consideration. More specifically, this strategy entails developing a model that (i) retains the core mechanism of the abstract model while (ii) adjusting other elements of the model so the model better reflects the token case being explained. I use some examples from the segregation research that I have been involved in during the last few years to illustrate the strategy.

10:40 coffee

## Session 1 – Decisions

- 11:10 **Selcan MUTGAN** *Institute for Analytical Sociology*  
**Simulating Segregation: Empirical Calibration with Full-Population Administrative Data**
- 11:30 **Eva VRIENS** *National Research Council Italy*  
**Efficiency-equality considerations in designing interventions using ABM**
- 11:50 **Silvia LEONI** *Maastricht U*  
**Simulating higher educational decisions: a data-driven agent-based modeling framework**
- 12:10 **Marijn KEIJZER** *IAST*  
**Modeling echo chambers: Model discrimination using macro-experiments**
- 12:30 *lunch*

## Session 2 – Networks

- 14:00 **Federico BIANCHI** *U Milan*  
**High-threshold complex contagion and negative ties in the diffusion of stigmatized health measures: an empirical agent-based model**
- 14:20 **Marion HOFFMAN** *IAST*  
**An agent-based interpretation of exponential family models for graphs and partitions**
- 14:40 **Lucas SAGE** *National Research Council Italy*  
**The Diffusion of Innovativeness Among Scientists: Insights from an Empirically Calibrated Agent-Based Model**
- 15:00 *coffee*

## Keynote

- 15:30 **Gianluca MANZO** *Sorbonne*  
**Agent-Based computational Models (ABMs): A short theoretical introduction**

The talk intends to provide a set of theoretical guidelines to help ABMs' practitioners to see the larger picture within which it makes sense to use the tool as a research method for the analysis of empirical social mechanisms. In particular, the talk covers the following points: 1. ABMs' diversity (KISS versus KIDS principle); 2. ABMs' specificities (generative versus correlational understanding of causal inference); 3. ABMs' flexibility (object-oriented programming); 4. ABMs' challenges (corresponding to "typical" critiques ABMs receive). The talk largely builds (please forgive me for this!) on Manzo G. (2022) *Agent-based Models and Causal Inference*. Chichester (UK), Wiley (Wiley Series in Computational and Quantitative Social Science).

16:30 *break*

## Session 3 – Methods

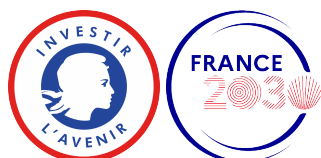
- 17:00 **Firouzeh Rosa TAGHIKHAH** *U Sydney*  
**Where Does Theory Have It Right? A Comparison of Theory-Driven and Empirical Agent-Based Models**
- 17:20 **Martin ARVIDSSON** *Institute for Analytical Sociology*  
**Counterfactuals at different levels of analysis: assumptions and pitfalls**
- 17:40 **Marco PANGALLO** *Centai*  
**Data-driven economic agent-based models: what they are, new methods, success stories**

---

**Organizers:** Marijn Keijzer, Lucas Sage, Selcan Mutgan & Martin Arvidsson

**Contact:** [abm.workshop@iast.fr](mailto:abm.workshop@iast.fr)

This event is funded by a French government subsidy managed by the Agence Nationale de la Recherche under the framework of the investissements d'avenir programme reference ANR-17-EURE-0010.



Institute for  
Advanced  
Study in  
Toulouse



Toulouse  
School of  
Economics