

Ama1 MACHTALAY

Mohammed VI Polytechnic University, Morocco

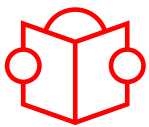


Research field

Mathematics

PhD title

From mean-field games to agent-based models (and back) through Markov Chain aggregation



Keywords

- mean-Field game
- agent-based model
- Markov chain
- complex systems
- numerical methods

Summary

One of our core research direction is the investigation of micro-macro models involved in complex systems such as cell populations, crowd dynamics, social behavior and traffic flows. There are several dedicated methods and tools, which are more or less flexible in accounting for the most informative microscopic features. However, as soon as we take as working assumption that these complex systems are made of agents which interact with each other and with

their environment in view of individual preferences or objectives, the recourse to game theory is very appealing.

To summarize, limited flexibility interacting agents governed by stochastic dynamical systems have a powerful macroscopic limit descriptor through mean-field games, while virtually unlimited flexibility interacting agents have no game versions, and a promising but yet unexplored - in the game theoretic view - Markov Chain Aggregation approach.



Supervisor
Prof. Ahmed RATNANI
UM6P, Morocco



Co-supervisor
Prof. Daniel KRESSNER
EPFL