Simulating adaptive behaviors in linear Public Goods Games

In this study, numerical simulations are conducted to analyze models of linear Public Goods Games wherein players are evenly distributed across a specified number of groups. The agents operate within their respective groups, adhering to rule sets that are formulated based on behaviors observed in human subjects during laboratory and online experiments. These agents, should they find their group unsatisfactory, possess the ability to transition to other groups through a mechanism grounded in probabilistic decisions.

The numerical models developed through this study aspire to be pivotal in crafting innovative designs for upcoming online experiments involving human participants. Furthermore, these online experiments hold the potential to be adapted into thesis projects, given that time constraints permit.

For potential expansion or adaptations of this project into other game-theoretical frameworks, such as coordination, conflict, or coalition games executed within group settings or on network platforms, consultations and discussions are open and encouraged.

Required skills

- **Proficient programming skills**: Applicants should possess proficiency in a suitable programming language. Familiarity with Python or Java is highly preferred.
- **Understanding of game theory**: A solid foundational understanding of game-theoretical setups will be advantageous. This knowledge will aid in comprehending and potentially expanding the scope of the project to include other frameworks such as coordination, conflict, or coalition games.
- **Numerical simulation experience**: Prior experience in conducting numerical simulations is desirable. Experience in modeling complex systems through simulations will be a valuable asset.

Supervisor: Alberto Antonioni, Carlos III University of Madrid, Spain
E-mail: alberto.antonioni@uc3m.es