

Self-Organization Among Large Language Model Agents

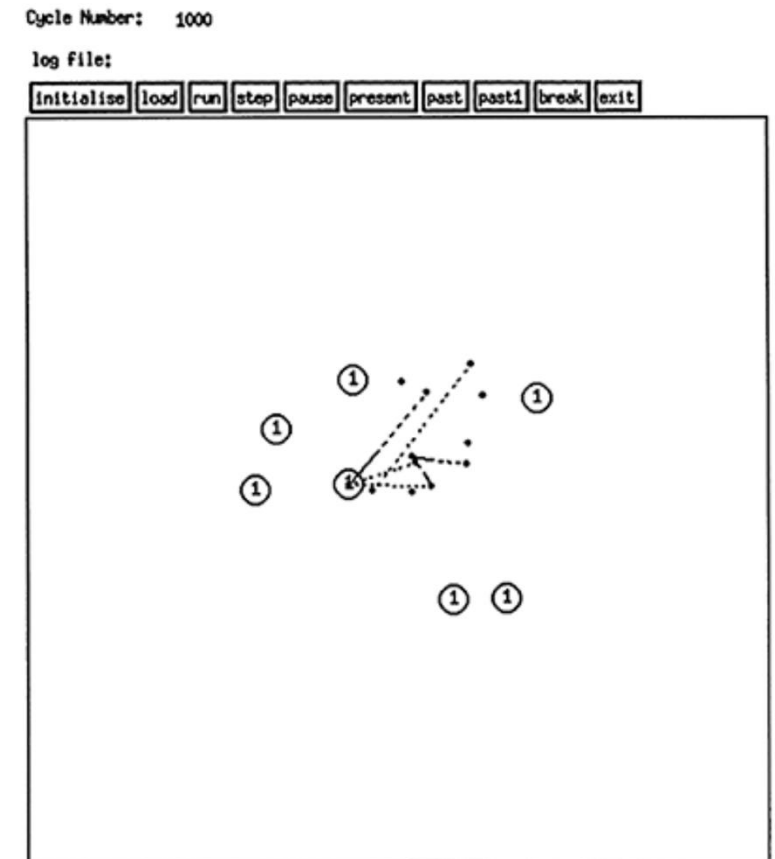
Team Project Spring/Summer 2025

Chair of Data Science in the Economic and Social Sciences

Supervisor: Georg Ahnert

Evolution of Organized Society (EOS)

- The EOS project (Doran et al., 1994) studied **growing social complexity** among humans approx. 20,000 years ago using simulations
 - Main idea: Humans (agents) need to cooperate to efficiently gather resources
 - Hierarchies form when resources are clustered & when gathering needs >1 agent
- But: Early simulations were completely rule-based and **could not model realistic discussions** between agents



Generative Agent Based Models

- **Large language models (LLMs)** are a promising new tool for more realistic agent-based simulations
 - e.g., Park et al. (2023): *Generative Agents: Interactive Simulacra of Human Behavior*
- Language can be used to model:
 - Discussions among agents
 - Interactions with the world
 - Self-reflection and decision formation
 - Agent memory



Team Project: Self-Organization Among Large Language Model (LLM) Agents

- Re-create the EOS **sandbox environment**
- Implement **LLM-based agents** with personal goals, discussions, actions
- **Experiment** with resource distribution, agent greediness, etc.

- Prerequisites
 - **Strong** Python programming skills
 - Ideally previous experience with LLMs

Team Project: Self-Organization Among Large Language Model (LLM) Agents

- **Language:** English
- **Duration:** 6 months
- **Participants:** 3–5
- **Prerequisites:** *Strong* Python skills, ideally previous experience with LLMs
- **Process:**
 - Lots of coding, coordination/software engineering
 - Regular meetings with the supervisor to present and discuss your progress
 - 2 presentations in front of the chair: intermediate results, final results
 - Written report to be submitted at the end
- **Contact:** Georg Ahnert – ahnert@uni-mannheim.de