



Multi-Agent AI Team Collaboration in Cooperative Environments

Master - This thesis focuses on modeling teamwork within the Cooperative Cuisine (CoCu) environment as a multi-agent AI system. The aim is to explore the integration of individual AI agents, some of which are based on Large Language Models (LLMs), assigned to specific team roles such as Planner, Critic, Monitor, Executor, and potentially a Memory Agent that learns from past episodes. This research will investigate the dynamics of AI-driven teamwork and the effectiveness of role-specific agents in enhancing collaboration and performance in cooperative settings.

Literature: <u>Saeedi et al. (2025)</u>, <u>Li et al. (2024)</u>, (Figure 2: <u>Xie et al.</u> (2025))





Tasks

- Develop a framework for multi-agent Al collaboration with distinct roles in the Cooperative Cuisine environment.
- Implement and test LLM-based agents for specific team roles and assess their interactions.
- Analyze the learning capabilities of a Memory Agent in improving team performance over time.

Your Profil

- Basic understanding of AI concepts and a willingness to learn about multi-agent systems.
- Experience with programming languages such as Python and familiarity with LLMs.
- Interest in AI-driven teamwork and the integration of role-specific agents within a composite framework.

Interested?

If you are interested or have further questions, please send an email to <u>fschroeder@techfak.uni</u>.