



At the Chair of Operations Management at the TUM School of Management, we are looking for interested and qualified students to conduct their

Master's Thesis

on the topic:

LLM-Based Multi-Project Scheduling

This thesis addresses solving the resource-constrained multi-project scheduling problem (RCMPSP) with a Large Language Model (LLM)-based approach. The latter incorporates a multi-agent system, where different agents are responsible for making specific types of decisions such as determining eligible activities, selecting the next activity to be scheduled, and scheduling a selected activity. Each agent utilizes the same LLM to make its decisions, with a system prompt that defines properties such as the agent's role and the context of the problem or decision, along with decision-specific information included in the prompt.

The scope of this thesis is to provide a literature review on the RCMPSP, solution approaches, and multi-agent based LLM scheduling. Afterwards, the thesis involves programming an LLM-based multi-agent approach for the RCMPSP and conducting a computational study to compare the LLM-based approach with existing heuristics on existing benchmark instances.

Your tasks:

- Literature review on the RCMPSP and its solution approaches and on multi-agent LLM-based scheduling.
- Programming a multi-agent LLM-based approach for the RCMPSP.
- Conduct a computational study, where the multi-agent LLM-based approach is compared to existing heuristics on a set of existing benchmark instances.

Requirements:

- Solid basis in Operations Research
- Interest in and first experience with LLMs
- Programming skills in Python

Beginning date: as soon as possible

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