

Master Thesis

Application of Interactive Reinforcement Learning for the development of a human-swarm interaction assistant system.

The aim of this thesis is to design an interactive reinforcement learning system supporting human swarm interaction. The application domain of such a system is in smart cities and production systems, where human operators of the distributed robotic systems should consider high-dimensional, parametric spaces for making decisions. This thesis should design a user-centered decision-making approach with expert operators to steer such a system. The design should be developed as a reinforcement learning agent prototype and should be validated using case studies within simulated environments to foster human decision-making processes. Specifically, the proposed solution should emerge as an algorithmic approach to dynamically suggest different decisions to users based on current system status.

Scope of the thesis

An exploration in the state-of-the-art in integration of Reinforcement learning in different domains should give an overview of existing applications of reinforcement learning for intelligent assistance of human operators. Furthermore, a target domain which is not considered in the state-of-the-art use cases can be selected for validating the results of the thesis. A systematic solution should be developed and implemented to facilitate decision making by human operators. Last step should be validation of the proposed solution using quantitative or qualitative measurements. Considering the limitations, challenges, boundaries, and conditions of targeted should be helpful to open the discussion for future research directions.

Your profile:

- You are enrolled at the University of Lübeck as a master student.
- You are interested in disruptive technologies and their applications in research projects.
- You like to work in a team, are flexible and reliable.
- You have knowledge about swarm robotics and cyber physical systems
- You have some programming skills in Java, Python or C++.

How to apply:

Write us an email at javad.ghofrani@uni-luebeck.de to arrange a meeting and talk.

The master thesis can be written in German or English