

Testbed for Multi-Agent Learning

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Description:

Almost ever since ML has become a scientific interest, researchers have also become interested in the case where multiple entities learn and act in the same environment. The field of multi-agent learning (MAL) has, however, evolved more slowly, as MAL is a more difficult problem than single-agent learning, adding an additional layer of complexity by multiplying the number of agents. Moreover, the computational resources needed to perform multi-agent learning increase much faster than the number of agents itself.

The purpose of the project is to **develop new multi-agent learning techniques** through the creation of a **holistic framework for the design, deployment, and execution of MAL simulations**. The framework will support representative cases and applications in the field and will enable the comparison of MAL applications. The framework will provide the necessary building blocks for enabling rapid development of new multi-agent learning methods and distributed execution of experiments in high-performance computing environments.

FLASH-MAS Deployment and testing

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Description:

FLASH-MAS is a framework for the fast, flexible deployment of multi-agent system. It has been design to be highly modular and to interoperate with various communication protocols, other distributed systems, and other MAS frameworks.

FLASH-MAS is an ongoing project, already containing modules for deployment on Android devices and interoperation with ROS.

This subject requires students to design relevant scenarios and to configure and test the deployment of FLASH-MAS according to these scenarios, as well as to perform comparisons between the performance and features of FLASH-MAS and other competing MAS frameworks; as well as to develop interoperation between FLASH-MAS and other frameworks such as Jade and JaCaMo.

Multi-Agent Systems for DeepLearning Explainability

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Description:

Right now there already exist a large number of Machine Learning methods, especially based on Neural Networks and Deep Learning. All these models have their advantages, disadvantages, and appropriate usage scenarios.

An agent acting in an environment may need to use various models in various situations. These models could be searched for, downloaded from, and updated in the larger multi-agent system the agent is part of.

The purpose of these project is to lay the foundations for a MAS in which learning models are seen as affordances which are managed, used, and updated by agents, in order to improve the performance of the MAS as a whole.