

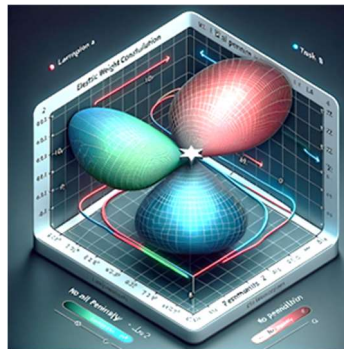
Master's Thesis (m/w/d) Continual Learning for Deep Reinforcement Learning with regularization for robotic manipulation sceneries

Problem formulation

The challenge of catastrophic forgetting in Deep Reinforcement Learning (DRL), particularly in the field of robotic manipulation, is a significant barrier to creating adaptable AI systems. Regularization-based continual learning methods, such as EWC, Memory-Aware Synapses (MAS), Synaptic Intelligence (SI), etc., offer promising approaches to mitigate this issue. For instance, Elastic Weight Consolidation (EWC) is an approach in neural networks for preserving important learned information during the acquisition of new knowledge by identifying and consolidating key neural weights. This research aims to delve into these methods, with a primary focus on EWC, to develop robots capable of learning and adapting over time without losing prior knowledge.

Task definition

You will embark on a comprehensive exploration of the family of regularization-based continual learning methods dominated by Elastic Weight Consolidation (EWC) as well as Memory Aware Synapses (MAS) and Synaptic Intelligence (SI), specifically applied to DRL algorithms in robotic manipulation. Your work will involve transferring innovative regularization approaches in practical vision-based robotic manipulation scenarios and conducting a rigorous analysis of their effectiveness. The goal is to advance the field of robotic manipulation by enabling robots to learn and adapt over time without forgetting previous knowledge.



You shall offer

- Solid knowledge base and experience in computer vision, deep learning.
- Basic knowledge in reinforcement learning, good experiences also highly expected.
- Coding skills in Python and Linux.

We will offer

- The most state-of-the-art technologies in deep learning and computer vision.
- Powerful GPU server for training your AI.
- Nice supervisors.

Research area:
Computer Vision,
Deep Learning

Requirement:

- Experimental
- Theoretical
- Practical
- Simulation
- Construction (CAD)

Studiengang:

- Mechanical Engineering
- Mechatronics
- Electronics
- Info-Tech
- Informationswirtschaft
- Wirtschaftsingenieurwesen

Begin: From now on

If you are interested, please send us an e-mail with your **curriculum vitae** and a current **transcript of records**.

Contact person:

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Please note that your data will be treated in accordance with the applicable data protection regulations as part of the application process.