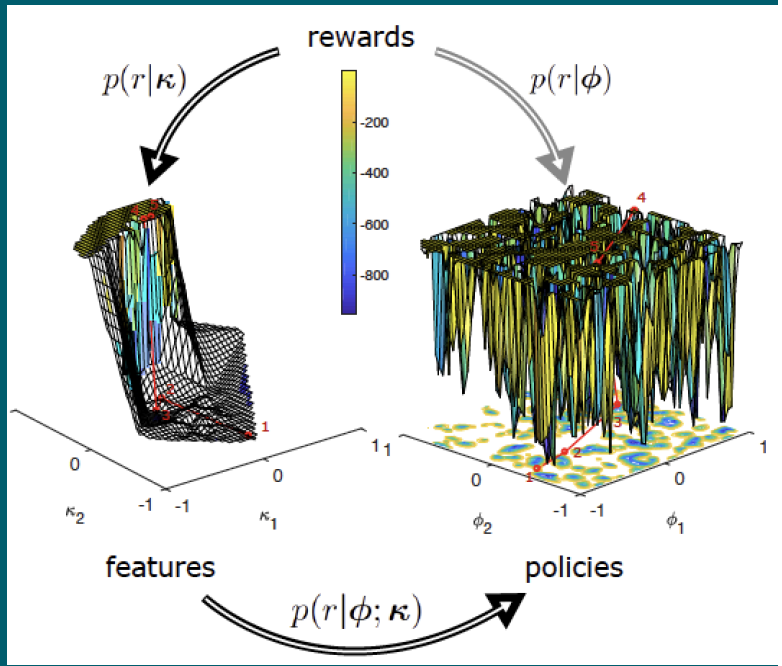
UNIVERSITÄT ZU LÜBECK
INSTITUT FÜR ROBOTIK
UND KOGNITIVE SYSTEME

Institute for Robotics and Cognitive Systems | Prof. Dr. Elmar Rueckert

Master's Thesis

Hierarchical Acquisition Functions for Bayesian Optimization

Learning control policies in robotic tasks requires a large number of interactions due to small learning rates or unknown constraints. In contrast humans can infer solutions often already after a single trial. In this thesis, a neural Bayesian optimization algorithm is investigated that replicates the cognitive inference and memorization process of human motor learning. For that we will investigate hierarchical reinforcement learning in feature spaces which is part of a ongoing research project. The approach builds on the powerful Bayesian optimization framework and will be evaluated in an autonomous car parking challenge . Parts of the results will enter a scientific paper where the student will become a co-author.



Tasks

You will study and experiment with state of the art reinforcement learning (RL) methods. Initially, the features will be predefined and you can start with efficient RL implementations. The final goal is to combine the approach with automatic feature learning in deep nets.

Qualification

Highly interested in AI, reinforcement learning or neural networks. Some experience with Matlab or Python.

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