

Bachelorthesis

Towards data-driven optimal tracking using reinforcement learning

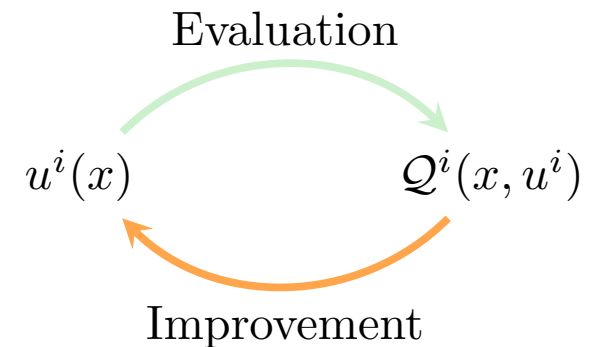
Reinforcement learning (RL) is a suitable framework for learning optimal control policies for unknown dynamical systems. Recent works have leveraged the so-called fundamental lemma in order to design linear quadratic optimal regulators (using input-state and input-output data). This led to computationally efficient algorithms with strong convergence guarantees.

An important next step is to study linear quadratic optimal tracking. Such problems have been addressed in RL literature, albeit using tools different than those mentioned above. The goal of this thesis is to extend the results to the optimal tracking case in three different settings:

- Tracking of known set points using input-state and input-output data,
- Tracking of constant references, using, e.g., integral action,
- Optimal output regulation, where the reference is generated by a known exosystem $r_{t+1} = Fr_t$.

Requirements: Good command of English language, strong background in mathematics, Regelungstechnik (I/II) as well as very good Matlab/LaTeX skills.

Starting date: The topic will be offered starting from mid April 2026.



Contact

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