

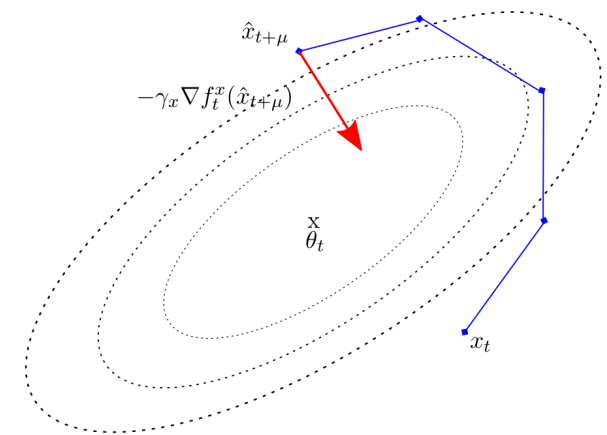
Bachelor-/Masterthesis

Online convex optimization for controlling dynamical systems

Recent successes in the field of online learning and online optimization have led to a growing interest in learning-based control techniques and introduced new methods for controller design.

Specifically, Online Convex Optimization (OCO) is an online learning framework which is applied in sequential decision making problems where feedback is only revealed to the algorithm after a decision is made. Therefore, OCO algorithms are able to minimize unknown time-varying cost functions while handling constraints. In addition, many of these algorithms do not require complex online calculations. In this research direction, we are working on applying the OCO framework to the problem of controller synthesis for dynamical systems maintaining these advantageous properties. This problem is tackled by directly applying the OCO framework to design controllers as well as by combining the OCO framework with existing approaches, e.g., reference governors.

Possible topics for Bachelor-/Masterthesis include theoretical works, e.g., the application of an OCO algorithm to design a controller and the subsequent analysis of the resulting closed loop, as well as practically oriented works on simulation, implementation, and testing of OCO controllers with real dynamical systems.



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