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THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

PHD STUDENT SEMINAR

Online Control of Continuous-Time Linear Systems: A Model-Free Approach via Policy Gradient Methods

By

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Abstract

We consider the problem of stabilizing and learning in continuous-time linear systems, where the state dynamics follow an action-driven linear stochastic differential equation and the cost is quadratic in both the state and action. While existing works have proposed several model-based algorithms, they all require an additional warm-up phase. To bridge this gap, we propose a policy gradient-based, model-free algorithm that achieves $O(\sqrt{T})$ regret guarantees for online learning without any preliminary phase. Our analysis of the model-free method contributes to the field by extending the concepts of strong stability and perturbation analysis from the discrete time setting to continuous settings, which may be of independent interest.

Date : 24 Sep 2024 (Tuesday)

Time : 5:00pm

Venue : Room 2405 (Lifts 17-18)

All are Welcome!