



CSC Seminar

SPEAKER

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TITLE

Recent advances in suboptimal feedback control for PDEs

ABSTRACT

The synthesis of suboptimal feedback laws for controlling nonlinear dynamics arising from semi-discretized PDEs will be presented. The approximation of Hamilton-Jacobi-Bellman (HJB) equations for high dimensional problems using Radial basis functions (RBF) on unstructured grids is considered. I will explain how to generate a scattered mesh driven by the dynamics and the selection of the shape parameter to tune the RBF parameters. Then, I will show a recent approach based on the State-dependent Riccati Equation (SDRE), providing offline, online, and hybrid offline-online alternatives to the SDRE synthesis. The hybrid offline-online SDRE method reduces to the sequential solution of Lyapunov equations, effectively enabling the computation of suboptimal feedback controls for two-dimensional PDEs. Numerical tests for the Sine-Gordon, Allen-Cahn, and viscous Burgers' PDEs are presented, providing a thorough experimental assessment of the proposed methodologies.

Tuesday, June 15, 2021 at 2 pm

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