

Stochastic Control of Decentralized Singularly Perturbed Systems

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Abstract : Designing a controller for stochastic decentralized interconnected large scale systems usually involves a high degree of complexity and computation ability. Noise, observability, and controllability of all system states, connectivity, and channel bandwidth are other constraints to design procedures for distributed large scale systems. The quasi-steady state model investigated in this paper is a reduced order model of the original system using singular perturbation techniques. This paper results in an optimal control synthesis to design an observer based feedback controller by standard stochastic control theory techniques using Linear Quadratic Gaussian (LQG) approach and Kalman filter design with less complexity and computation requirements. Numerical example is given at the end to demonstrate the efficiency of the proposed method.

Keywords : decentralized, optimal control, output, singular perturb

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