Regulating Stochastic Uncertainty: Static/Dynamic Covariance Control and Applications

In this lecture we will focus on the problem to regulate uncertainty in stochastically driven dynamical systems. In particular, we will develop both, finite and infinite horizon covariance control and explain the close relation between such problems and problems in modeling of stochastic flows with specified marginals. We will close with an analysis of the problem to control coupled nonlinear stochastic oscillators in a force field as a motivating example.