Speaker: Henrik Sandberg, KTH

Title: Information-Regularized Optimal LQG Control

Abstract:

We consider a joint sensor and controller design problem for linear Gaussian stochastic systems in which a weighted sum of quadratic control cost and the amount of information acquired by the sensor is minimized.

This problem formulation is motivated by situations where a control law must be designed in the presence of sensing, communication, and privacy constraints.

We show that the optimal joint sensor-controller design is relatively easy when the sensing policy is restricted to be linear. Namely, an explicit form of the optimal linear sensor equation, the Kalman filter, and the certainty equivalence controller that jointly solves the problem can be efficiently found by semidefinite programming (SDP). Whether the linearity assumption in our design is restrictive or not is currently an open problem.

This is joint work with Takashi Tanaka, MIT.
