

TUESDAY Seminar

MAR 29 | 6 PM

[via Zoom \(link\)](#)



STATE ESTIMATION METHODS FOR CYBER-PHYSICAL SYSTEMS

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The first step to achieving control and decision objectives is to have excellent knowledge of the current state of our system. For example, to implement a cruise controller an aircraft must know its current position and velocity with respect to its targets. The aircraft can then correct to maintain a desired speed and heading towards its destination. To control air traffic from the ground we need to track this information in addition to the plane's current flight mode, a discrete decision variable. I will introduce common methods for state estimation from noisy measurements, including Kalman Filters, the Viterbi Algorithm, Particle Filters, and Moving Horizon Estimators, and discuss the tradeoffs between them for problems like aircraft landing, circuit monitoring, and vehicle tracking. In addition to presenting my results on nonlinear and hybrid state estimation, this talk will serve as an overview of statistical inference for dynamical systems, an important subject for those interested in autonomous applications like self-driving cars and smart power grids.

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