



## Seminar Announcement

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Monday, October 3, 2016

Green Hall, Room 0120

10:10AM

### Ensemble Observability of Dynamical Systems

**Abstract:** In recent years, there has been an emerging trend in control theory to not just consider the dynamics of systems described in terms of single points evolving in state space, but more generally, the dynamics of systems that are described in terms of distributions of points evolving in state space. There are several practically relevant problems related to this theoretical concept ranging from the control of quantum ensembles to the estimation of state and parameter distributions within cell populations. At the same time, the consideration of this new class of systems motivates the study of new fundamental systems theoretic concepts. In this talk, we will discuss the ensemble observability problem, which consists of reconstructing a density of initial states from the evolution of the density of outputs under a finite-dimensional dynamical system. We aim to give a broad overview of the ensemble observability problem for both linear and nonlinear systems.

**Bio:** Shen Zeng studied at the University of Stuttgart, where he received degrees in Engineering Cybernetics, Mechatronics and Mathematics. From 2013 to 2016, he was a Ph.D. student at the Institute for Systems Theory and Automatic Control, University of Stuttgart, where he is currently a postdoctoral researcher.