Instructor: S. Lakshmivarahan, DEH Room 230

Class time: T-Th 1.30 to 2.45 pm

Class Room: FELGAR HALL- Room 320

Office Hours: T-Th from 9.00-10.00am and 3.00 to 3.30pm in Room DEH 230

Topics: In this special topics course, we plan to cover principles and techniques of Statistical Methods for Dynamic Data Assimilation.

1. **Principles of Statistical Estimation**: Least squares and maximum likelihood methods, Bayesian framework and minimum variance techniques.

2. **Kalman Filtering methods**: Derivation of the classical Linear Kalman filtering equations in discrete time and its applications.

3. **Nonlinear Filters**: Derivation of Non-linear filter equations in discrete time. The need for approximations.

4. **Approximate Filters**: Derivation of first-order (extended) and second-order approximation, Ensemble Kalman filters of various kinds. Their applications.

5. **Unscented filters**: Derivation and its applications.

6. **Particle Filters**: Theory and applications.

Pre-requisite: Working knowledge of linear algebra, basic probability and statistics. Good working knowledge of MATLAB.


Grading: There will be 8-10 assignments, one mid-term and the final. Assignments will cover 40%, mid-term 30% and the final 30% of the overall grade.

Final Exam: 1.30 to 3.30 pm on Monday, May 4th 2015

Grading Scale: 90-100 -A; 80-89 - B; 70-79-C; 60-69-D; Below 60-F.

For more information contact: varahan@ou.edu or voice mail at 325-2978.