CME345: Model Reduction

Schedule: Spring 14, M-W-F (2 of 3) 9:30 am – 10:45 pm
Venue: Meyer 143
Units: 3

Course Description
Model reduction is an indispensable tool for computational-based design and optimization, statistical analysis, embedded computing, and real-time optimal control. It is also essential for scenarios where real-time simulation responses are desired. This course presents the basic mathematical theory for projection-based model reduction. It is intended primarily for graduate students interested in computational sciences and engineering. The course material described below is complemented by a balanced set of theoretical, algorithmic, and Matlab computer programming homework assignments.

Course Outline

Instructors
David Amsallem: amsallem@stanford.edu, Durand Building, Room 028A
Charbel Farhat: cfarhat@stanford.edu, Durand Building, Room 257

Prerequisites
- Solid foundations in numerical linear algebra (CME 200 or equivalent).
- Basic numerical methods for ODEs (CME 206 or equivalent).

Textbook
- Approximation of Large Scale Dynamical Systems, A.C. Antoulas, SIAM 2005.
- Lecture notes and reading materials provided by instructor.
Homework
- Assigned every two weeks.
- Subject to the Stanford Honor Code.

Exam
- Midterm.
- Final project.

Course Grade
- Based 30% on the grades for the homework assignments.
- Based 40% on the grade for the midterm examination.
- Based 30% on the grade for the final project.
- In fairness to all and to enable a timely posting of the solutions, the following policy will be enforced. Homework assignments will be due on time. A maximum grace period of 2 days will be allowed at a penalty of 25% of the homework grade. After this grace period, any submitted homework will not be accepted.

Students with Documented Disabilities
Students who may need an academic accommodation based on the impact of a disability must initiate the request with the Student Disability Resource Center (SDRC) located within the Office of Accessible Education (OAE). SDRC staff will evaluate the request with required documentation, recommend reasonable accommodations, and prepare an Accommodation Letter for faculty dated in the current quarter in which the request is being made. Students should contact the SDRC as soon as possible since timely notice is needed to coordinate accommodations. The OAE is located at 563 Salvatierra Walk (phone: 723-1066).