

Joshua L. Hurst
Mechanical Engineering Ph.D. Candidate
Center for Automation Technologies and Systems (CATS)
Rensselaer Polytechnic Institute

Research Description:

Model reduction strategies for large-scale nonlinear ODE's. In particular applying Balanced Truncation to Linear Time Varying equations with emphasis on Molecular Dynamic Simulations used to compute material properties. Also combining model reduction with Quasilinearization – a Newton's method for nonlinear operators - in this case the solution to nonlinear ODE's.

Advisor: John Wen

Thesis Title: “Material design and model reduction of molecular dynamics”

Education

Rensselaer Polytechnic Institute, Troy, NY, USA
Ph.D., Mechanical Engineering, 2007 (GPA: 3.83)
M.S., Mechanical Engineering, 2003 (GPA: 3.83)
B.S., Mechanical Engineering, 2002 (GPA: 4.0)

Work Experience

- Research Assistant, Multiscale Systems Engineering for Nanocomposites, Rensselaer Polytechnic Institute, 2003-present
- Teaching Assistant, Rensselaer Polytechnic Institute: Modeling and Control - fall 2007, Laboratory Introduction to Embedded Control - spring 2007, Design of Mechanical Systems - fall 2003, Mechanical Systems Lab - spring 2003
- Engineering Intern, GE Global Research and Development, Automation and Controls Lab, Niskayuna, New York, summer 2002

Skills

- Computer skills: Windows, Linux, OsX, Matlab/Simulink, Fortran, C/C++, ProEngineer, PSpice, MS Office, LaTeX
- Mechanic: small engine/equipment troubleshooting/repairs, 2 & 4 stroke, some welding/fabrication

Honors

- W. Cary Franklin Fellowship, 2005-2006
- Master Teaching Assistant: selected from teaching assistants across the campus to mentor new graduate teaching assistants, 2003 & 2004
- Arthur M. Green Prize: “Awarded to the senior in the Mechanical Engineering Department who has demonstrated the all-round qualities most likely to lead to distinction in the profession in the opinion of the Mechanical Engineering Faculty”, 2002
- 4.0 Award, Undergraduate Graduation 2002
- Deans List, NY Merit Scholarship of Academic Excellence, Rensselaer Alumni Scholarship
- Air Force ROTC 3 Year Scholarship Recipient. When active awarded: Sons of the American Revolution Award, Cadet of the Month, 1998, 1999

Publications and Patents

- J. Hurst, J. Wen, “Computation of Shear Viscosity: A Systems Approach,” American Control Conference, June 2005.

Memberships and Activities

- IEEE student member, Basketball, Soccer, Hiking, Camping, Engine building, Jeeps, ATV's, Skiing, Snowboarding, Car restoration, Paintball

Contact Information

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