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Chris Meissen

Education

2011–2014 **Ph.D. Mechanical Engineering**, *University of California, Berkeley*.
Major: Control Systems
Minors: Optimization and Mathematics
GPA: 3.75

2007–2009 **M.S. Mechanical Engineering**, *Colorado State University*.
GPA: 3.9

2003–2007 **B.S. Mechanical Engineering**, *Kansas State University*.
GPA: 3.5

Experience

Research

2011–2014 **Ph.D. Research**, *University of California, Berkeley*.
Advisor: Dr. Andrew Packard

Performance and Stability Certification of Nonlinear Dynamical Systems

- Development of a distributed performance certification framework for dissipative dynamical systems
- Implemented efficient computational tools based on distributed optimization algorithms(i.e. dual decomposition and alternating direction method of multipliers(ADMM))
- Successfully applied to large scale nonlinear systems using sum-of-squares (SOS) programming to certify global stability and L_2-gain performance
- Region of attraction estimation of nonlinear systems using SOS programming
- Local quantitative performance analysis of nonlinear feedback systems using integral quadratic constraints

Uncertainty Quantification for Complex Dynamic Systems

- Incorporation of data and models from multiple different experiments to determine bounds on experimental parameters
- Development of software to fit response surface models of complex dynamical systems
- Determination of model sensitivity to parameter changes

Region of Attraction Estimation using Probabilistic Robust Control

- Determination of probabilistic bounds on the region of attraction by Monte Carlo simulation
- Comparison with traditional analysis methods

2007–2009 **M.S. Research**, *Colorado State University*.
Advisor: Dr. Patrick Fitzhorn

Development and Validation of a Physical Model of a Modern Twin Tube Damper
- Developed a coupled fluid-mechanical model to simulate damper performance
- Experimentally tested dampers to correlate and validate model
- Investigated effects of nonlinear damper characteristics

2006–2007 **Undergraduate Research Assistant**, *Kansas State University*.
Advisor: Dr. Bruce Babin

Measurement of Flow Disturbance by Duct Transitions
- Assisted with setup and implementation of experiment
- Calibrated pressure transducers and hot wire anemometer for data acquisition

Teaching

2011, 2013 **Graduate Student Instructor**, *University of California, Berkeley*.
Supervisor: Dr. Andrew Packard and Dr. Panos Papadopoulos
- E7: Introduction to Computer Programming for Scientists and Engineers
- Awarded Berkeley Outstanding Graduate Student Instructor Award
- Developed an autograding system that was distributed to students to allow them to test and grade their own assignments

2009–2011 **R&D Engineer**, *OptimumG LLC*, Denver, Co.
Supervisor: Claude Roulle, President, and Emmanuel Hugon, Project Manager
- Developed and taught a 10-day course on vehicle dynamic simulation, MATLAB programming, and applied mathematics to graduate students at Institut Supérieur des Matériaux et Mécanique Avancés (ISMANS)
- Created and presented seminars on vehicle dynamics, simulation, dampers, and data acquisition

2007–2008 **Graduate Teaching Assistant**, *Colorado State University*.
Supervisor: Dr. Dave Alciatore
- ME 417: Control Systems

Supervisor: Dr. Patrick Fitzhorn
- ME 202: Engineering Design II

Industry

2009–2011 **R&D Engineer**, *OptimumG LLC*, Denver, Co..
Supervisor: Claude Roulle, President, and Emmanuel Hugon, Project Manager
- Developed and deployed vehicle dynamics simulation and tire data analysis software in MATLAB, VB.NET, C#, and C++
- Involved in vehicle and tire testing, data acquisition installation and calibration, test planning and organization, data processing and analysis
- Consulted for Dunlop, Oreste Berta SA, APPLUS Idiada, and Zwickau University

Additional

2007–2009 **Graduate Student Advisor**, *Formula SAE*, Colorado State University.

- Advised on both technical and management aspects of the project
- Performed vehicle dynamics modeling and simulation in MATLAB and Adams
- Indexed and characterized damper performance

2003-2007 **Member**, *Formula SAE*, Kansas State University.

- Participated in competition in Michigan in 2005, 2006, and 2007
- Suspension and chassis team leader in 2006-2007
- Composites team leader in 2004-2006

2006–2007 **Honeywell Senior Design Project**, *Kansas State University*.

- Collaborated with Honeywell engineers to design and manufacture metrology probes
- Improved accuracy and repeatability of measurement of ring gauges

Honors and Awards

Berkeley Graduate Division Block Grant Award (2012-2013)

Berkeley Outstanding Graduate Student Instructor Award (2011-2012)

Colorado Graduate Grant (2007-2009)

Kansas State Presidential Scholarship and Engineering Scholarship (2003-2007)

National Merit Scholar Finalist and Scholarship Recipient (2003-2007)

Publications and Reports

Meissen, Chris, Laurent, Lessard, Andrew Packard. "Performance Certification of Interconnected Systems using Decomposition Techniques." American Control Conference, 2014.

Meissen, Chris. "Design and Analysis of Nonlinear Control Techniques for a Log Rolling Robot." Final Project, ME237: Nonlinear Control, UC Berkeley, 2013.

Meissen, Chris. "Compositional Performance Certification of Interconnected Dynamical Systems." Final Project, EECS 227A: Convex Optimization, UC Berkeley, 2013.

Meissen, Chris. "Development and Validation of a Physical Model for a Modern Twin Tube Damper." M.S. Thesis, Colorado State University, 2009.

Technical Skills

Languages MATLAB\Simulink, Python, C++, C#, VB.NET, LaTeX

Software Solidworks, Pro\Engineer, Catia, ANSYS, Abaqus, Fluent, Adams, LabVIEW, MathCAD, Mathematica

Interests Dissipative Dynamical Systems, Nonlinear and Robust Control Synthesis and Analysis, Distributed Optimization, System Identification, Machine Learning, Hybrid Systems