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**Scott J. Moura**  
Ph.D. Pre-Candidate  
Department of Mechanical Engineering  
University of Michigan, Ann Arbor  
<http://www.umich.edu/~sjmoura>

G029 Auto Lab  
Automated Modeling Laboratory  
Ann Arbor, Michigan 48104-2125, USA  
Tel: (734) 763-7388  
[sjmoura@umich.edu](mailto:sjmoura@umich.edu)

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## **Education**

### **University of Michigan, Ann Arbor, Michigan USA**

M.S., Mechanical Engineering, Systems and Controls (December 2008)  
Ph.D., Mechanical Engineering, Systems and Controls (expected April 2011)  
GPA: 7.891/8.000

### **University of California at Berkeley, Berkeley, California USA**

B.S., Mechanical Engineering (May 2006)  
GPA: 3.713/4.000

## **Experience**

### **Automated Modeling Laboratory, University of Michigan – Ann Arbor, Michigan**

*Graduate Student Research Assistant* (August 2006 - present)

Conducting research on optimal power management and design of plug-in hybrid electric vehicle (PHEV) powertrains, under the direction of Professor Jeffrey L. Stein and Dr. Hosam K. Fathy. Developed high fidelity, scalable models of PHEVs. Formulated optimal control policies that minimize monetary cost of fuel consumption and electric power grid energy with respect to stochastic distributions of drive cycle behavior and trip length. Investigated trade-off between battery design/cost and power management with respect to performance. currently developing battery hardware-in-the-loop testbed to validate electrochemical simulation models and prototype control designs that minimize PHEV battery degradation.

### **DaimlerChrysler Corporation - Detroit, Michigan**

*Summer Intern, Electrical Engineering - Vehicle Engineering* (May 2006 - August 2006)

Supported launch of the 2007 Dodge Nitro electrical systems and components by documenting build issues, identifying root causes, and implementing solutions; gained experience with electrical wiring, Vector CANoe, and corporate database programs.

### **Ford Motor Company - Dearborn, Michigan**

*Summer Intern, Manufacturing & Quality* (May 2005 - August 2005)

Strengthened manufacturing quality procedure and developed coaching module, reviewed engine development process, participated in product audits, evaluated manufacturing and assembly plant quality operating system.

### **Southern California Edison - Rosemead, California**

*Professional Aide, Staff Engineering* (June 2004 - August 2004)

Maintained, modeled, and documented SQL databases and designed online applications using XHTML, JSP, CSS, Flash, and JavaScript.

### **BIS Computer Solutions, Inc. - La Crescenta, California**

*Sales Assistant, Computer Technician* (June 2003 - July 2003)

Performed cold-calling to various wholesale distributors to promote Oracle based software solutions and PDA solutions, performed computer maintenance.

## **Publications & Presentations**

### **Peer-Reviewed Journals**

1. S. J. Moura, D. S. Callaway, H. K. Fathy, and J. L. Stein, "Impact of Battery Sizing on Stochastic Optimal Power Management in Plug-in Hybrid Electric Vehicles," under review
2. S. J. Moura, H. K. Fathy, D. S. Callaway, and J. L. Stein, "A Stochastic Optimal Control Approach for Power Management in Plug-in Hybrid Electric Vehicles," under review.

### **Conferences Proceedings**

1. Y. A. Chang, S. J. Moura, "Real-Time Air-Flow Control in Fuel Cell Systems: An Extremum Seeking Approach," Submitted to *Proceedings of the 2009 American Control Conference*, St. Louis, MO, 2009.
2. S. J. Moura, D. S. Callaway, H. K. Fathy, and J. L. Stein, "Impact of Battery Sizing on Stochastic Optimal Power Management in Plug-in Hybrid Electric Vehicles," *Proceedings of the 2008 IEEE International Conference on Vehicular Electronics and Safety*, pp. 96-102, Columbus, OH, 2008. (Invited Paper)
3. S. J. Moura, H. K. Fathy, D. S. Callaway, J. L. Stein, "A Stochastic Optimal Control Approach for Power Management in Plug-in Hybrid Electric Vehicles," *Proceedings of the 2008 ASME Dynamic Systems and Control Conference*, Ann Arbor, MI, 2008.

### **Technical Presentations**

1. S. J. Moura, D. S. Callaway, H. K. Fathy, and J. L. Stein, "Plug-in Hybrid Electric Vehicle Power Management: Optimal Control and Battery Sizing," *2008 Society of Hispanic Professional Engineers Conference*, Phoenix, AZ, 2008. (Technical Paper Competition Finalist)
2. S. J. Moura, D. S. Callaway, H. K. Fathy, and J. L. Stein, "Plug-in Hybrid Electric Vehicle Power Management: Optimal Control and Battery Sizing," *Engineering Graduate Symposium*, Ann Arbor, MI, 2008. (2<sup>nd</sup> Place Poster Award Winner, System Analysis and Control Session)
3. S. J. Moura, H. K. Fathy, D. S. Callaway, and J. L. Stein, "A Stochastic Optimal Control Approach for Power Management in Plug-in Hybrid Electric Vehicles," *Automotive Research Center Conference*, Ann Arbor, MI, 2008.
4. S. J. Moura, H. K. Fathy, D. S. Callaway, and J. L. Stein, "Plug-in Hybrid Powertrain Modeling," *Engineering Graduate Symposium*, Ann Arbor, MI, 2007. (2<sup>nd</sup> Place Oral Presentation Award Winner, System Analysis and Control Session)
5. S. J. Moura, Dongsuk Kum, H. K. Fathy, and J. L. Stein, "Hybrid Powertrain Optimization for Plug-in Microgrid Power Generation," *Automotive Research Center Conference*, Ann Arbor, MI, 2007.

## **Awards & Honors**

### **National Science Foundation (NSF) Graduate Research Fellowship**

National Science Foundation (2008 - 2011)

### **Rackham Merit Fellowship (RMF)**

University of Michigan Rackham Graduate School (2006 - 2011)

### **2008 ASME Dynamic Systems and Control Conference, Ann Arbor, MI USA**

Best Presentation in Session

### **2008 Society of Hispanic Professional Engineers Conference, Phoenix, AZ USA**

1<sup>st</sup> Place Technical Paper Competition

### **2008 Engineering Graduate Symposium, University of Michigan**

2<sup>nd</sup> Place Poster, Control Systems Session

### **2007 Engineering Graduate Symposium, University of Michigan**

2<sup>nd</sup> Place Oral Presentation, System Analysis and Control Session

### **Michigan Memorial Phoenix Energy Institute (MMPEI)**

MMPEI-Rackham Energy Fellowship, Honorable Mention (2007-2008)

### **SHPE Academic Achievement Award**

Society of Hispanic Engineers and Scientists, University of Michigan (2007)

### **National Science Foundation (NSF)**

Graduate Research Fellowship Program (GRFP), Honorable Mention (2006 - 2007)

### **Christopher A. Burrows Memorial Scholarship**

Community Scholarship Foundation (2002)

### **Paul Rickershauser Memorial Award**

Community Scholarship Foundation (2002)

### **The Governor's Scholars Award**

Governor's Scholarship Programs (2001)

## **Society Memberships**

### **American Society of Mechanical Engineers (ASME)**

Student Member, Dynamic Systems and Control Division (2002 - present)

### **Society of Hispanic Professional Engineers (SHPE)**

University of Michigan, Student Chapter (2006 - present)

Community Service Committee (Sept 2007 - present)

UC Berkeley Hispanic Engineers & Scientists, Student Chapter (2002 - 2006)

Administrative Vice-President (2004-2006)

## **Website Design Projects**

**Automated Modeling Laboratory, University of Michigan**

<http://aml-vangogh.engin.umich.edu>

**2008 Engineering Graduate Symposium, University of Michigan**

<http://www.engin.umich.edu/students/gradsymposium/>

**JoeRoth12.com**

<http://www.joeroth12.com>

**California Alumni Association of Michigan**

<http://caamichigan.blogsome.com>

**IUTAM Symposium on Cellular, Molecular and Tissue Mechanics**

[http://me.engin.umich.edu/IUTAM\\_symp/](http://me.engin.umich.edu/IUTAM_symp/)

**Fitness Spark**

<http://www.fitnessspark.com>

**California Dance Team, UC Berkeley**

<http://caldanceteam.berkeley.edu>

## **Skills**

### **Computer Programming**

*Engineering:* MATLAB, Simulink, 20-Sim, LaTeX, Optimus, iSight, LabVIEW, SolidWorks, COSMOS, ANSYS, AutoCAD, Vector CANoe, C++

*Web Development:* PHP, MySQL, AJAX, WAMP, XHTML, CSS, CGI, SSI, RSS, XML, Javascript, Joomla!, Java, JSP

### **Software Tools**

Microsoft Office, Adobe Flash, Adobe Photoshop, Adobe Premiere, Sibelius

### **Leadership**

Administrative Vice-President of the UC Berkeley SHPE Chapter

25th Annual HES Career Fair Coordinator

California Leadership Academy & United Spirit Association Drum Major Camp

Drum Major of 2004 Mystikal Drum & Bugle Corps (Newbury Park, CA USA)

### **Music**

Conducting, Oboe, English horn, Alto/Tenor/Baritone Sax, Timpani, Cymbals, Bass Drum

## **Graduate Courses Completed**

Linear Spaces & Matrix Theory (Math 419)

Analytical Methods in Mechanics (ME 501)

Control Systems Analysis & Design (EECS 460)

Probability and Random Processes (EECS 501)

Design of Digital Control Systems (ME/EE 561)

Dynamics & Vibrations (ME 440)

Linear Systems Theory (EECS 560/ME 564)

Intermediate Dynamics (ME/AERO 540)

Control of Advanced Powertrain Systems (ME 569)

Modeling Dynamic Systems (ME 560)

Linear Feedback Control Systems (EECS 565)

Design Optimization (ME 555)

Intro to Discrete Event Systems (EECS 661)

Dynamic Programming (IOE 512)