

COLLEGE OF ENGINEERING

Control Seminar



Sponsored by: Bosch, Ford, and Toyota

Identification and Control of PDE Battery Electrochemistry Models



SCOTT MOURA

Assistant Professor | Director of eCAL
University of California, Berkeley

Friday, September 21, 2018

3:30 – 4:30 pm 1500 EECS

ABSTRACT: Batteries are ubiquitous. However, today's batteries are expensive, range-limited, power-restricted, die too quickly, charge too slowly, and susceptible to safety issues. For this reason, model-based battery management systems (BMS) are of extreme interest. In this talk, we discuss eCAL's recent research electrochemical-based BMS, which are modeled by nonlinear partial differential equations (PDEs). Specifically, we discuss (i) optimal experiment design for parameter identification, and (ii) optimal safe-fast charging control. Finally, we close with exciting new perspectives for next-generation battery systems.

BIO: Scott Moura is an Assistant Professor at the University of California, Berkeley in Civil & Environmental Engineering and Director of eCAL. He received the PhD degree from the University of Michigan in 2011, the MS degree from the University of Michigan in 2008, and the BS degree from the UC Berkeley, in 2006 - all in Mechanical Engineering. He was a postdoctoral scholar at UC San Diego in the Cymer Center for Control Systems and Dynamics, and a visiting researcher in the Centre Automatique et Systèmes at MINES ParisTech in Paris, France. He is a recipient of the O. Hugo Shuck Best Paper Award, Carol D. Soc Distinguished Graduate Student Mentoring Award, Hellman Faculty Fellows Award, UC Presidential Postdoctoral Fellowship, National Science Foundation Graduate Research Fellowship, University of Michigan Distinguished ProQuest Dissertation Honorable Mention, University of Michigan Rackham Merit Fellowship, and Distinguished Leadership Award. He has received multiple conference best paper awards, as an advisor & student. His research interests include control & estimation theory for PDEs, optimization, machine learning, batteries, electric vehicles, and the smart grid.



Questions? Contact: Judi Jones asap@umich.edu