CHEMICAL ENGINEERING

SEMINAR SERIES

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Identification and Control of PDE Battery Electrochemistry Models

ABSTRACT: Batteries are ubiquitous. However, today,Äôs 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,Äôs 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.

RECEPTION 3:30 • LECTURE 4:00 – 5:00
PHYSICS ASTRONOMY BLDG. PAA A 118

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BIOGRAPHY: Scott Moura is an Assistant Professor at the University of California, Berkeley in Civil & Environmental Engineering and Director of eCAL. He received the Ph.D. degree from the University of Michigan in 2011, the M.S. degree from the University of Michigan in 2008, and the B.S. 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 Syst√®mes 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