AIChE Webinar Series

Computing & Systems Technology Division (CAST) Welcomes


Carl Laird

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PURDUE UNIVERSITY

# *Parallel Computing and Opportunities in Nonlinear Optimization*


**Abstract:**

Nonlinear programming has proven to be an efficient tool for important large-scale inverse problems like optimization of dynamic systems, parameter estimation, and decision making under uncertainty. However, engineering and scientific needs continue to push the boundaries of existing mathematical programming tools, and problems can become prohibitively large, often outstripping the capabilities of a single workstation. Furthermore, computer chip manufacturers are focusing on parallel computing architectures, and future performance improvements demand algorithms that are capable of utilizing these modern parallel architectures. In this short presentation, I will discuss different architectures for parallel computing, introduce some of the techniques we use to measure parallel performance, and discuss algorithms that can be used for parallel solution of nonlinear optimization problems.


**Biography:**

Carl Laird is an associate professor in the School of Chemical Engineering at Purdue University. Dr. Laird's research interests include large-scale nonlinear optimization and parallel scientific computing with applications in chemical processes, safety systems, water distribution networks, and public health. He is the recipient of several research and teaching awards, including the prestigious Wilkinson Prize for Numerical Software based on his work on IPOPT, the National Science Foundation Faculty Early Development (CAREER) Award, and the Montague Center for Teaching Excellence Award. Dr. Laird earned his Ph.D. in Chemical Engineering from Carnegie Mellon in 2006 and his Bachelor of Science in Chemical Engineering from the University of Alberta.

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**Mar 11, 2014 at 11:00 am Eastern Time**

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