USC Viterbi
School of Engineering
Ming Hsieh Department of Electrical and Computer Engineering

Ming Hsieh Institute Seminar Series

Computer Engineering

Limits of the quantitative approach, or why parallel and distributed system energy management needs to move on

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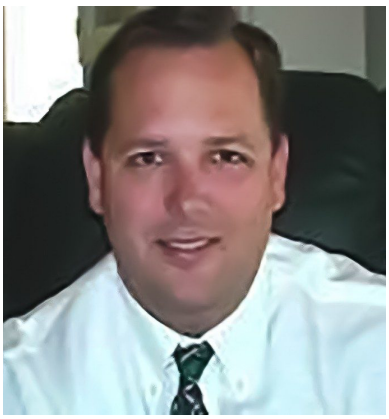
10:15am-11:30pm
EEB 248

Abstract: In this talk, we begin with the progression of parallel computer system power management over the last two decades. In particular, we focus on the evolution of quantitative design approaches and the emergence of effective parallel and distributed system runtime power management. We observe that the growing complexity of today's machines limits the effectiveness of traditional quantitative approaches. The Compute-Overlap-Stall (COS) model of parallel computation is proposed to accurately capture the effects of emergent orchestrated power management of processor, memory, and thread throttling. The implication of our findings is that as power management techniques pervade, new machine-learning performance evaluation and prediction approaches will be essential to future computer system designs.



Bio: Professor Kirk W. Cameron directs the stack@cs Center for Computer Systems at Virginia Tech. He pioneered Green HPC (PowerPack, Green500, SPECPower, grano.la) and his software has been downloaded by more than 500,000 people in 160+ countries. His accolades include both NSF and DOE Career Awards, IBM and AMD Faculty Awards, best papers (e.g., HPDC 2017) and the LLNL Science/Technology Excellence Award. His internationally acclaimed SeeMore cluster has been visited by tens of thousands and was named the second best RPi project of all time by MagPi Magazine. In 2017 he was named an ACM Distinguished Scientist and in 2018-2019 he held a Distinguished Visiting Fellowship from the UK Royal Academy of Engineering.