



**CECS**

**CENTER FOR EMBEDDED & CYBER-PHYSICAL SYSTEMS  
UNIVERSITY OF CALIFORNIA · IRVINE**

## CECS Seminar



*“Accurate and Stable CPU Power Modelling and Run-Time System Management”*

**Matthew Walker**

PhD Student in Electronics and Computer Science at  
University of Southampton

Friday, July 27th

11:00 a.m.- 12:00 p.m.

Donald Bren Hall 4011

**Abstract:** Modern processors must provide an ever-increasing level of performance and are therefore including higher numbers of Heterogeneous Multi-Processing (HMP) units. Intelligent run-time control of performance and power consumption is required to extend battery-life in mobile systems, reduce energy and cooling costs in data centres, and increase peak performance while respecting thermal and power constraints. Accurate online power estimation is essential in guiding run-time power management mechanisms and energy-aware scheduling decisions.

In this talk Matt will share his experience with CPU modelling and run-time management, and present three open-source software tools for developing power models on mobile devices (<http://www.powmon.ecs.soton.ac.uk>), calibrating performance and energy models in the gem5 simulation framework (<http://gemstone.ecs.soton.ac.uk>), and developing run-time management algorithms (<https://github.com/PRiME-project/PRiME-Framework/>).

**Biography:** Matthew J. Walker received his M.Eng. degree in Electronic Engineering (Hons) from the University of Southampton, UK, in 2013. In 2016 he worked on implementing non-volatile memory technologies in mobile systems at Intel Labs, CA, and has also completed two internships at Arm, UK, in 2015 and 2018. He is currently in his fourth year of his PhD at the University of Southampton researching CPU modelling techniques and run-time management approaches.