

COLLEGE OF ENGINEERING AND COMPUTER SCIENCE

Distinguished Speaker

ENERGY EFFICIENT CONTROL IN SMART BUILDINGS AND GRID

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Building energy consumption in the USA has two key components: commercial (36% of the total) and residential (38% of the total). Although the contribution of these two parts are similar, recent studies mainly focused on the commercial buildings. In this presentation, I first show on how residential energy management can be made "smart". We developed HomeSim, a residential energy simulator that makes it possible to investigate the impact of renewable energy, centralized vs. distributed in-home energy storage, and intelligent appliance rescheduling, lighting and HVAC. We also analyze how batteries in smart homes should be used to maximize their benefits. In the second part of my presentation, I focus on quantifying the effects of smart building controllers on the grid. We take a university microgrid circuit structure as the baseline which hosts distributed smart buildings and energy generation. We build an accurate and efficient smart grid simulator to study the grid dynamics and demonstrate how distributed smart building controllers can threaten the stability of the grid.

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Baris Aksanli is an Assistant Professor in the Department Electrical and Computer Engineering, San Diego State University. He received his PhD and MS degrees in Computer Science from UCSD in 2015 and 2012, respectively, and two BS degrees in Computer Engineering and Mathematics from Bogazici University, Turkey in 2010. His research interests include energy efficient cyber physical systems, human behavior modeling in the Internet of Things, big data for energy efficient embedded systems. He won two best paper awards in 2011 and 2013, Internet2 IDEA Award in 2011, Intel's Spontaneous Recognition Award in 2012 and UCSD Campus Sustainability Award in 2016. He previously worked in Lawrence Berkeley National Laboratory in 2011 and Intel in 2012. He has also been actively collaborating with several companies including Google, Microsoft, Panasonic, Oracle, and working in projects funded by SRC, NSF and California Energy Commission.



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