

Keyue Ma Smedley, received her Ph.D. in electrical engineering from the California Institute of Technology. She is currently a professor in the Department of Electrical Engineering and Computer Science at the University of California at Irvine, the Director of the UCI Power Electronics Laboratory, and a cofounder of One-Cycle Control, Inc.

Dr. Smedley's research includes high-efficiency dc-dc converters, high-fidelity class-D power amplifiers, single-phase and three-phase PFC rectifiers, active power filters, inverters, V/VAR control, energy storage system, and utility-scale fault current limiters. She is an inventor of One-Cycle Control and the Hexagram power converter.

Dr. Smedley's work has resulted in 150 technical publications, 10 US/international patents, two start-up companies, and numerous commercial applications. Dr. Smedley is a recipient of UCI Innovation Award 2005. She was selected to be a IEEE Fellow in 2008 for her contributions in high-performance switching power conversion. Her work with One-Cycle Control, Inc., has won Department of the Army Achievement Award in the Pentagon in 2010.

Title of the presentation: Renovating the Power System

The power system is the heart and arteries of modern civilization. In recent years, however, congestion and blackouts have become more frequent. This is because infrastructure updates lag demand growth. The direct consequence is a reduced operation margin, which forces the grid to operate at its hairy edge. In addition, the adverse impact of fossil-fuel burning in generating stations amplifies the need for more renewables, which further stresses the power system. It is a pressing task to renovate our power system to make it more reliable, able to support a higher percentage of renewable sources, and cleaner.

In this presentation, Dr. Smedley will address challenges and opportunities related to our power system: why do we have more blackouts now, why don't we put as much renewable energy on the grid as possible, what makes the grid smarter.

Dr. Smedley will talk about her effort in development of universal One-Cycle Control technology for fast, accurate, and stable control of three-phase power converters for power system applications aiming to minimize grid loss, alleviate grid congestion, improve grid stability, and enable high penetration of renewables. In the last two decades, semiconductors have revolutionized the IT and communication world; with proven speed and controllability, Dr. Smedley believes that high power semiconductors are ready to revolutionize the power system.