

**Keyue Ma Smedley** received her B.S. and M.S. degrees in electrical engineering from Zhejiang University, Hangzhou, China, in 1982 and 1985, respectively, and the M.S. and Ph.D. degrees in electrical engineering from the California Institute of Technology, Pasadena, CA, in 1987 and 1991, respectively.



She was employed at the Superconducting Super Collider from 1990 to 1992, where she was responsible for design and specification of AC-DC converters for all accelerator rings. She is currently a Professor in the Department of Electrical Engineering and Computer Science at the University of California at Irvine (UCI) and the Director of the UCI Power Electronics Laboratory. She is a cofounder of One-Cycle Control, Inc.

Her research activities include high efficiency DC-DC converters, high-fidelity class-D power amplifiers, active and passive soft switching techniques, single-phase and three-phase PFC rectifiers, active power filters, grid-connected inverters for alternative energy sources, Ultra fast VAR on demand for modern grid, motor drive, solar, wind, energy storage power conversion, utility scale fault current limiters, etc.

Dr. Smedley is the inventor of One-Cycle Control (OCC) method for high switching power conversion and Hexagram converter for high-power medium-voltage power processing. In 1997, the UCI Power Electronics Laboratory demonstrated a high fidelity OCC class-D amplifier that first time in the world achieved  $<0.07\%$  THD in entire audio band under the condition of 15% DC power ripple resulting in 7X reduction of size and weight. In 2003, Dr. Smedley's team first time in the world realized hardware-enabled OCC universal three-phase controller that combines PFC rectifier, active power filter, inverter, VAR, and bidirectional converter functions all in one with unmatched performance in speed, accuracy, and zero-load stability. In 2007, Dr. Smedley's team invented Hexagram converter, the first multilevel converter in the world with constant power flow to each power module leading to minimum capacitor requirement thus lower cost and higher reliability. In 2010, Dr. Smedley led a consortium of academic, utility, and industrial researchers to complete a one-year field demonstration of 15kV fault current limiter in the commercial power grid first time in the US history.

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

The cover story titled "Power engineering storming into mainstream" in the EE Times weekly magazine November 23, 1998 issue remarked "Power conversion is spanning a broadening range of disciplines with techniques like 'one-cycle control' developed by Keyue Smedley at UC Irvine's Power Lab." IEEE news magazine "The Institute" article "2008 Class of Fellows Makes History" reported "Power Pro" Keyue Smedley's "groundbreaking work" in the field of power electronics. In the December issue of IEEE Woman in Engineering Magazine, article "Renovating the Power System" reported Dr. Smedley's "breakthrough technology" not only leading to a more stable and precise power system and but also allowing reduction of fossil fuel usage and human carbon footprint.