



**CECS**

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

## CECS Seminar

### *“Electrification of Mobilities, the Challenges and Opportunities”*



### **Dr. Naehyuck Chang**

Executive Vice President, Samsung SDI America

Tuesday, February 6<sup>th</sup>  
3:00-4:00 p.m.  
Location: EH 2430

**Abstract:** The electrification of mobilities is essential for sustainability, and governments are pushing hard to expedite electric vehicle penetration. As a result, it is not surprising to see a large proportion of electric vehicles on the road today. Nevertheless, the battery industry faces significant challenges starting from late 2023, which will continue years from now.

In this talk, we will introduce industry perspective challenges and opportunities for mobility electrification in both the technical and business aspects. The technical aspects to be covered are energy density, charging time, lifetime, cost, and safety. We will also bring up infrastructure issues for electric vehicle charging. As per the business aspects, we will discuss the electrification roadmap, government support, marketing challenges, supply chain, circularity, expected battery costs, raw material costs, and profit margin. In conclusion, we will summarize the expected academic contributions to the electrification of mobilities.

**Biography:** Naehyuck Chang is an Executive Vice President at Samsung SDI America. He was the previous Head of Development at Samsung SDI Headquarters from 2021 to 2023. Dr. Chang was in charge of all the automotive and energy-storage product developments, from cells to systems. Samsung SDI is one of the world's leading high-performance battery companies. He is the Founder of EMVcon, Inc., Irvine, CA, for vehicle electrification, funded by Samsung.

Dr. Chang received the B.S., M.S., and Ph.D. degrees from the Department of Control and Instrumentation, Seoul National University, Seoul, South Korea, in 1989, 1992, and 1996, respectively. From 1997 to 2014, he was with the Department of Computer Science and Engineering at Seoul National University. From 2011 to 2013, Dr. Chang was the Vice Dean of the College of Engineering at Seoul National University. Since 2014, he has been a Full Professor at the Department of Electrical Engineering, Korea Advanced Institute of Science and Technology, Daejeon, South Korea. He was the Strategy Planning Committee Chair at the College of Engineering, Korea Advanced Institute of Science and Technology. Dr. Chang was a visiting professor at the Arizona State University and the University of Southern California in 2005 and 2009, respectively. Dr. Chang's research interests include low-power cyber-physical systems and Design Automation of Things, such as systematic design and optimization of fuel cell systems, energy storage systems, electric vehicles, drones, and energy harvesting. Dr. Chang is specifically interested in mobility electrification in terms of design, optimization, and management of optimizing the power, energy, and lifetime of the battery cells. Dr. Chang's initial research also includes nuclear power plant monitoring and control systems, high-speed train monitoring systems, and real-time systems.