



Department of Engineering
Seminar Program
Wednesday, February 3, 2016
Shanahan Teaching and Learning Center
Lecture Hall 1430, 4:15pm

“Fingerprint Sensor Integration in Cellular Handsets”

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Summary:

Fingerprint sensors have become increasingly ubiquitous in smartphones since their inclusion in the very successful Apple iPhone 5S in 2013. Prior to 2013, fingerprint sensors had been integrated into several cellular handsets worldwide, especially in Japan, but they did not achieve widespread market acceptance. While fingerprint sensors are essentially semiconductor devices, their integration poses many unique challenges. Most semiconductor devices are hidden and protected inside the shell of the phone. Fingerprint sensors, in their very nature, require the user to directly place the finger on their surface in order to capture the fingerprint image, leading to issues with cosmetics and durability. In addition, with smartphones the area (“real estate”) on the front face of device is at a premium, making the size of the fingerprint sensors an important concern.

This research seminar will provide a brief overview of the various types of biometric and fingerprint sensors. It will cover the research into the applications and usability of fingerprint sensing, and the solutions to durability, cosmetics and size issues by coatings, coverings and software. These solutions involve multidisciplinary engineering approaches that combine research in material properties, signal propagation, image enhancement and matching algorithm. The very active research into the future of fingerprint sensors will also be discussed.

Bio:

Dr. James Yeh is currently serving as an Adjunct Professor of Electrical and Computer Engineering, Mechanical Engineering, and Engineering Technology at Cal Poly Pomona. He received his B.S. degree from Caltech and his M.S. and Ph.D. degrees from U.C. Berkeley. He worked for 10 years with fingerprint sensor industry leaders AuthenTec (now Apple) and Validity (now Synaptics) in cellular handset integration. Later generations of the sensors are now included in Apple and Samsung mobile phones. He was a part of the telecommunication industry in Asia for 5 years in the area of wireless R&D and DSL deployment. Prior to this, Dr. Yeh was a Principal Investigator at AT&T Bell Laboratories in the field of wireless communications and optical storage. He holds 7 US Patents for his research, and his publications and patents have been frequently cited. His Ph.D. research was the founding technology for the RFID manufacturer Alien Technology. Dr. Yeh’s interests include wireless and cellular technology, biometric and security, educational robotics and infrared microscopy.