USC Viterbi School of Engineering
Ming Hsieh Department of Electrical Engineering

Integrated Systems Seminar Series

sponsored by the Ming Hsieh Institute

Terahertz Imaging Radar for Personal Screening Applications

Dr. Ken Cooper
Jet Propulsion Laboratory.

Friday September 6, 3:30 – 5:00 PM, EEB 248

A summary of the NASA Jet Propulsion Laboratory's 675 GHz imaging radar will be presented, with an emphasis on several key design aspects that enable fast, reliable through-clothes imaging of person-borne concealed objects for standoff ranges out to 40 m. These include a frequency-modulated continuous-wave (FMCW) radar technique with a 30 GHz bandwidth to achieve sub-centimeter range resolution, software to compensate for signal distortion and generate clear imagery, a low-noise microwave chirp generator, and a high-performance 675 GHz transceiver. The radar's optical design will also be described, which enables fast beam scanning for real-time frame rates of 4 Hz, as well as agile re-focusing over a large fractional range swath. Still faster speeds are on the horizon as multi-beam THz transceivers are developed.

Dr. Ken Cooper received an A.B. degree in physics from Harvard College in 1997, and a Ph.D. degree in physics from the California Institute of Technology in 2003. Following postdoctoral research in superconducting microwave devices, he joined the Jet Propulsion Laboratory as an RF Engineer in 2006. At JPL he has led an effort to develop terahertz imaging radars and transceiver arrays for national security applications. His research interests include submillimeter-wave radar, radiometry, spectroscopy, and device physics.