



IEEE Systems Council Chapter presents IEEE Distinguished  
Lecture Series on

## Digital Enveloping

**Speaker: Dr. Donald Chang, CEO of Spatial  
Digital Systems**

**Date: *February 2, 2018 (Fri)***

**Time: *12:30 – 1:30 PM***

**Location: *VEC 424, CSULB***

**Abstract:** There are needs for better privacy protection for data on cloud. Digital enveloping techniques will enhance privacy protection for data. They relate to “transforming” an information data stream with a digital envelope stream concurrently into a multi-dimensional data structure via Wavefront multiplexing (WF muxing, K-muxing). The **enveloped** data is then for cloud storage and transport. The techniques are focused to (1) appearance of enveloped data and (2) reliability of enclosed information data. The transform is mathematically identical to the function of a beamforming network (BFN) for a multibeam phased array. The information data stream will be on a first beam radiated toward a first direction, while the digital envelop stream will be on a second beam at a second direction. The multi-dimensional data structure features the aggregated data streams at elements of the multibeam phased array. We shall present results of digital enveloping by digital photos and audios in simulations, and do demos on real time enveloping digital voices by audio data streams.

### **About Speaker:**

Dr. Donald Chang is the CEO and the President of Spatial Digital Systems (SDS), formed in 2002 to develop smart antenna technologies for wireless communications. He is an expert on communications satellites, advanced satellite antennas, space based microwave remote sensing instruments, especially in passive synthetic aperture radiometry. He authors > 40 technical papers, holds > 100 U.S. patents, and has > 50 US patents pending on smart antennas, low cost spacecraft design, satellite constellation for multimedia applications, etc. Among the many awards honored from Hughes, the most impressive is the Hyland Award awarded in 2000 for his key contributions in digital beam-forming technology since early 1980s. Dr. Chang earned his Ph.D. & MSEE from Stanford Uni.

Light refreshment will be served.

For more information, please contact: Dr. Sean Kwon at [Sean.Kwon@csulb.edu](mailto:Sean.Kwon@csulb.edu)