

ECE Lecture Seminar Series

## **Radar Waveform and Processing Techniques for Radar Resolution Enhancement**

11:00AM, Friday, Dec. 6, SEO 1000

Prof. Mark R. Bell

School of Electrical and Computer Engineering, Purdue University  
West Lafayette, IN

**Abstract.** In this talk, I will review the basic ideas regarding delay-Doppler resolution in radar, which determines the ability of a radar system to separate targets that are close to each other in range and velocity. We will then investigate a number of waveform and signal processing techniques for enhancing delay-Doppler resolution. In particular, we will look at diversity waveform and frequency coded waveform techniques for resolution enhancement. We will then look at a biologically-motivated technique for increasing delay-Doppler resolution while suffering only a minor penalty in terms of detection performance. Finally, I will discuss some open problems in the area of radar resolution.



**Biography.** Mark R. Bell received the B.S.E.E. degree in electrical engineering from California State University, Long Beach, in 1981 and the M.S.E.E. and Ph.D. degrees in electrical engineering from the California Institute of Technology in 1982 and 1988, respectively. He is a Fellow of the IEEE. From 1979 to 1989 he was employed by Hughes Aircraft Company, Fullerton, CA. From 1981 to 1989 he was affiliated with the Radar Systems Laboratory at Hughes, where he held the positions of Member of the Technical Staff and Staff Engineer and worked in the areas of radar signal processing, electromagnetic scattering, radar target identification, and radar systems analysis. While at Caltech, he was a Howard Hughes Doctoral Fellow. Since 1989, he has been on the Faculty of Purdue University, West Lafayette, Indiana, where he is a Professor in the School of Electrical and Computer Engineering. His research interests are in the areas of radar and sonar, information theory, detection and estimation theory, stochastic modeling and communications.

Host: Prof. Danilo Erricolo, [derric1@uic.edu](mailto:derric1@uic.edu)