Department of Mathematical Sciences

Fall 2018

Colloquium Series

November 2, 2018 at 3pm in Bell Hall 143

Dr. Joe Lakey

New Mexico Sate University

Spatio-spectral limiting on hypercubes

A bandlimited function on the line - one whose Fourier transform vanishes outside an interval - has an analytic extension, so cannot be compactly supported, or time-limited. The so-called Bell Labs theory of Landau, Slepian, and Pollak in the 1960s systematically studied the sense in which signals can be approximately time and band limited by identifying the eigenfunctions and describing the behavior of the eigenvalues of the operator that first truncates to an interval in time then bandlimits to an interval in frequency. Analogues of the theory were also developed in the compact-discrete setting and in the finite DFT case. After surveying some highlights of the known theory, this talk will address aspects of a corresponding theory on the hypercube - the N-fold product of the integers mod 2. Emphasis will be put on identification of the eigenspaces of the analogue of the time- and band-limiting operator.

For further information, please contact Drs. Emil Schwab or Xiaogang Su, eschwab@utep.edu or xsu@utep.edu