Information Science and Technology Seminar Speaker Series

Stanley R. Rotman
Ben-Gurion University of the Negev

Target Detection in Hyperspectral Imagery with Singular Covariance Matrices

Wednesday, August 5, 2015

3:00 - 4:00 PM

TA-3, Bldg. 1690, Room 102 (CNLS Conference Room)

Abstract: Accurate covariance matrix estimation for high dimensional data can be a difficult problem; nevertheless it is needed for good target acquisition performance in hyperspectral data. In this talk we will investigate two methods to give a sufficient approximation for the covariance matrix while only using a small number of neighboring pixels. The first is the QLRX (Quasilocal Covariance Matrix RX algorithm) that uses the eigenvectors of a global set of points, coming from a non-stationary distribution, but eigenvalues of the local neighborhood. The second method is the SMT (Sparce Matrix Transform) that performs a set of K Givens rotations to estimate the covariance matrix. We will compare results from target acquisition that are based on both of these methods. An improvement for the SMT algorithm is suggested.

Biography: Stanley R. Rotman was born in Boston Massachusetts in 1958. He received the B.S., M.S. and Ph.D. degrees in Electrical Engineering from the Massachusetts Institute of Technology, in 1979, 1980 and 1985, respectively. His present position is full professor at Ben-Gurion University of the Negev, Dept. of Electrical and Computer Engineering, Beer-Sheva, Israel. He is a senior member of IEEE and a fellow of SPIE.

For the last decade, Prof. Stanley Rotman has been developing state-of-the art hyperspectral data analysis techniques for military and industrial applications. This includes innovative spectral target detection algorithms for tracking targets in four-dimensional space, new algorithms for sub-pixel target detection in spectral images, and new segmentation techniques for multipixel multispectral target detection in clutter.

For more information contact the technical host James Theiler, jtheiler@lanl.gov, 665-5682.

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