

Title: Hyperspectral Remote Sensing System Performance Analysis

Speaker: John Kerekes, Center for Imaging Science, Rochester Institute of Technology

Abstract:

For nearly thirty years now, airborne and satellite hyperspectral imaging sensors have been used to collect high spatial resolution (1-30 meter) imagery of the earth's surface in hundreds of co-registered, contiguous spectral channels. These data have been shown to enable the detection of objects smaller than a pixel due to the spectral information present. However, it is not always obvious beforehand if a given object will be detectable in a given scene, as performance has been observed to depend on many factors including illumination conditions, scene spectral complexity, target variability, sensor artifacts, as well as algorithm variations.

Our research has been exploring ways to predict and assess performance of hyperspectral subpixel detection for the past fifteen years. Methods have included analytical modeling tools, empirical blind tests, and quality metrics for spectral imagery. This talk will present a summary of lessons learned regarding the modeling and empirical quantification of hyperspectral subpixel object detection performance.

Bio:

John Kerekes received his BS, MS, and PhD in Electrical Engineering from Purdue University. From 1989 to 2004 he was a member of the Technical Staff at MIT Lincoln Laboratory. Since 2004 he has been an Associate Professor in the Center for Imaging Science at the Rochester Institute of Technology affiliated with the Digital Imaging and Remote Sensing Laboratory. He is currently on sabbatical as a Visiting Associate Professor at the Department of Electrical and Computer Engineering at the University of Rochester.

His research interests are in the modeling and analysis of remote sensing systems as well as general image and signal processing. He is a Senior Member of the IEEE, OSA, and SPIE. He is currently serving on the Administrative Committee of the IEEE Geoscience and Remote Sensing Society (GRSS) as the Vice President of Technical Activities. He is also serving as the Secretary of both the IEEE Rochester Section and the Western New York Chapter of the IEEE GRSS, as well as an Associate Editor of the IEEE Transactions on Geoscience and Remote Sensing.