SPoRT Seminar Series Presents:

Unsupervised Multi-Scale Change Detection from SAR Imagery for Monitoring Natural and Anthropogenic Disasters

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Date: Tuesday, June 13, 2017
Time: 2:15 P.M.

Location: NSSTC 3027

Abstract:

Remote sensing plays a critical role in operational monitoring of different types of natural, and anthropogenic disasters. Despite the all-weather capabilities of radar remote sensing, and its high performance in mapping, and monitoring of change, the application of radar data in operational monitoring activities has been limited. This is largely due to: (1) the high costs associated with obtaining radar data; (2) slow data processing, and delivery procedures; and (3) the limited temporal sampling provided by spaceborne radar-based satellites.

In this presentation, I will: (i) investigate unsupervised change detection techniques that can reliably extract signatures from time series of synthetic aperture radar (SAR) images, and provide the necessary flexibility for application to a variety of natural, and anthropogenic hazard situations; (ii) investigate effective methods to reduce the effects of speckle on change detection; (iii) automate change detection algorithms using probabilistic Bayesian inferencing; and (iv) ensure that the developed technology is applicable to currently, and future SAR sensors to maximize temporal sampling of a hazardous event. This is achieved by developing the algorithm on image amplitude information only, the sole image parameter that is available for every single SAR acquisition.

Automatic change detection technique for disaster monitoring was developed that is applicable for operational implementation. The developed technique can be described as a combination of an initial data enhancement step, followed by the core change detection algorithm, which includes image filtering, and automatic multi-scale change detection procedures.