

# EPSTEIN INSTITUTE SEMINAR ▪ ISE 651

## Scalable Optimization Algorithms For Large-Scale Subspace Clustering

**ABSTRACT** – Dr. Robinson will present recent work on the design of scalable optimization algorithms for aiding in the big data task of subspace clustering. In particular, he will describe three approaches that he and his group have recently developed to solve optimization problems constructed from the so-called self-expressiveness property of data that lies in the union of low-dimensional subspaces. Sources of data that lie in the union of low-dimensional subspaces include multi-class clustering and motion segmentation. The group’s optimization algorithms achieve scalability by leveraging three features: a rapidly adapting active-set approach, a greedy optimization method, and a divide-and-conquer technique. Numerical results demonstrating the scalability of their approaches will be presented.



**Dr. Daniel Robinson**

Assistant Professor, Johns Hopkins University  
Department of Applied Mathematics and Statistics, Whiting School of Engineering

**SPEAKER BIO** – Dr. Daniel Robinson received his Ph.D. from the University of California at San Diego in 2007. He spent the next three years working with Nick I. M. Gould and Jorge Nocedal as a Postdoctoral Researcher in the Mathematical Institute at the University of Oxford and the Department of Industrial Engineering and Management Sciences at Northwestern University. In 2011 he joined the Department of Applied Mathematics and Statistics in the Whiting School of Engineering at Johns Hopkins University. His primary research area is optimization with specific interest in the design, analysis, and implementation of efficient algorithms for large-scale convex/nonconvex and complementarity problems, and particular interest in applications related to healthcare and computer vision. He is a member of the Society of Industrial and Applied Mathematics (SIAM), Mathematical Optimization Society (MOS), the American Mathematical Society (AMS), and the Institute for Operations Research and the Management Sciences (INFORMS), in addition to being the INFORMS Vice-Chair for Nonlinear Optimization (2014-2016). Daniel has also served as the cluster chair for the 2016 International Conference on Continuous Optimization (ICCOPT) in Tokyo, Japan, as well as a Program Committee member for the 2017 AAAI Conference on Artificial Intelligence in San Francisco, California.

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**TUESDAY, MARCH 7, 2017**

**3:30PM – 4:50PM**

USC ANDRUS GERONTOLOGY CENTER (GER), Room 206