Center for Applied Mathematical Sciences Distinguished Lecturer, Spring 2016

Daniel Spielman

Yale University, Professor

Laplacian Matrices of Graphs: Algorithms and Applications

Abstract:
The Laplacian matrices of graphs arise in many fields including Machine Learning, Computer Vision, Optimization, Computational Science, and of course Network Analysis. We will explain what these matrices are and why they arise in so many applications. We then will survey recent progress on the design algorithms that allow us to solve such systems of linear equations in nearly linear time.
In particular, we will show how fast algorithms for graph sparsification directly lead to fast Laplacian system solvers. As an application, we will explain how Laplacian system solvers can be used to quickly solve linear programming problems arising from natural graph problems.

Monday, May 9, 2016

Kaprielian Hall

Tea: 3:00 p.m.
KAP 410

Lecture: 3:30 p.m.
KAP 414

Wine & Cheese: 4:30 p.m.
KAP 410

CAMS Director:
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Daniel Spielman is presently the Henry Ford II Professor of Computer Science, Mathematics, and Applied Mathematics at Yale University.

He has received many awards, including the 1995 ACM Doctoral Dissertation Award, the 2002 IEEE Information Theory Paper Award, the 2008 and 2015 Godel Prize, the 2009 Fulkerson Prize, the 2010 Nevanlinna Prize, the 2014 Polya Prize, an inaugural Simons Investigator Award, and a MacArthur Fellowship. He is a Fellow of the Association for Computing Machinery and a member of the Connecticut Academy of Science and Engineering. His main research interests include the design and analysis of algorithms, network science, machine learning, digital communications and scientific computing.

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