FALL 2018

RENSSELAER POLYTECHNIC INSTITUTE

DEPARTMENT OF MATHEMATICAL SCIENCES COLLOQUIUM

"Learning Graph Inverse Problems with Geometric Neural Networks"

Abstract:

Inverse Problems on graphs encompass many areas of physics, algorithms and statistics, and are a confluence of powerful methods, ranging from computational harmonic analysis and high-dimensional statistics to statistical physics. Similarly as with inverse problems in signal processing, learning has emerged as an intriguing alternative to regularization and other computationally tractable relaxations, opening up new questions in which high-dimensional optimization, neural networks and data play a prominent role. In this talk, I will argue that several tasks that are 'geometrically stable' can be well approximated with Graph Neural Networks, a natural extension of Convolutional Neural Networks on graphs. I will present recent work on supervised community detection, quadratic assignment, neutrino detection and beyond showing the flexibility of GNNs to extend classic algorithms such as Belief Propagation.

Joan Bruna (Courant Institute of Mathematical Sciences, NYU)

Monday, October 1, 2018

4-5pm

Amos Eaton 214

Host: Rongjie Lai

Refreshments served 3:30-4pm Amos Eaton 4th Floor Lounge