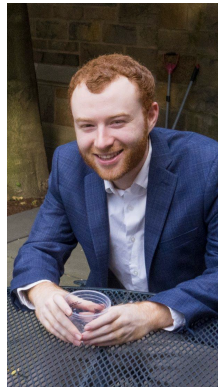


MASSACHUSETTS INSTITUTE OF TECHNOLOGY
DEPARTMENT OF MATHEMATICS

Simple Person's Applied Math Seminar (SPAMS)

Thursday, October 3, 2019

6:00pm – 7:00pm Room : 2 - 132



Aaron Berger
(MIT Math)

“ Probabilistic Zero Forcing ”

Abstract

Probabilistic zero forcing is a random coloring process on a graph designed to provide a simplified model of systems that spread across a network, such as the spread of infection in a population or the sharing of rumors in a community. The process begins with some subset of the vertices colored blue, and at each step each blue vertex forces some of its uncolored neighbors to become blue, with prescribed probabilities. The process terminates when every vertex is colored blue. It is a well-studied problem to minimize the expected propagation time, i.e., the expected time for all vertices to be colored blue, given some arbitrary connected graph and the choice of a single starting vertex colored blue. I'll discuss some interesting and counter-intuitive properties of this process, as well as some recent upper bounds which present a slick application of the optional stopping theorem from the theory of martingales.