

# Random Geometric Graphs: A Tutorial

By: Milan Bradonjic, Bell Laboratories, Alcatel-Lucent

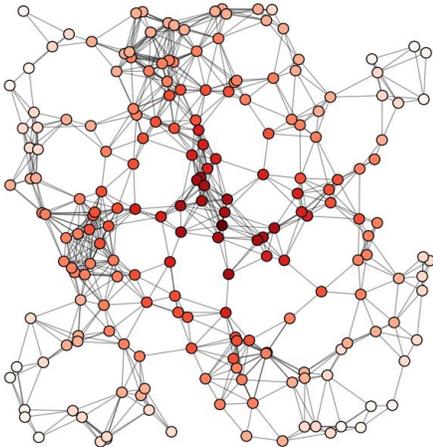


**Host: James Abello**

**Session 1: June 5, 9:30 – 11:30**  
**Session 2: June 11, 9:30 – 12:00**

## Abstract

One of the transitions from random graph models given by Erdos and Renyi to the models that may describe real processes in a more realistic manner is the model of Random Geometric Graphs (RGGs). An RGG is a graph resulting from placing nodes independently and uniformly at random on the unit square, and creating edges between pairs of nodes if their Euclidean distance is at most some given value. There has been a flurry of work on RGGs in the last two decades. The RGG model has been used in disciplines such as: wireless sensor networks, cluster analysis, statistical physics, hypothesis testing, and modeling data in a high-dimensional space.



The first session will introduce the necessary background and the main conceptual tools for this line of research. Seminal results on the connectedness and phase transition in RGGs will be discussed. The second session will present recent results on RGGs, as well as introduce a new structured random generative model of Geographical Threshold Graphs. Open avenues of research in this area will be discussed during the second session and software tools for further experimentation will be introduced.

## Speaker

Milan Bradonjic is a member of the technical staff in the Mathematics of Networks and Communications Research Department at Bell Laboratories, Alcatel-Lucent, Murray Hill, NJ. He obtained his Ph.D. at the University of California, Los Angeles and Dipl. Eng. at the University of Belgrade, both in Electrical Engineering. He was awarded The Departmental Fellowship at UCLA for excellence in studies. Milan Bradonjic spent three years as a postdoctoral research fellow in the Applied Mathematics and Plasma Physics Group, and Center for Nonlinear Studies, at Los Alamos National Laboratory. His research focuses on random graph theory (the limiting behavior and percolation on random discrete structures), applied probability and statistics, as well as algorithms and game theory on random graphs and networks.

## Location

DIMACS Seminar Room 431, CoRE Building, 4<sup>th</sup> Floor

For questions or more information, please contact Dr. Eugene Fiorini, Associate Director of DIMACS and Program Coordinator ([gfiorini@dimacs.rutgers.edu](mailto:gfiorini@dimacs.rutgers.edu)).

The Workshop is organized by the DIMACS REU program (<http://dimacs.rutgers.edu/REU/>)

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