Chiranjib Saha

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Research Interests

Stochastic geometry for wireless ad hoc, cellular and D2D networks, Heterogeneous cellular networks (HetNets), mmWave communication, Backhaul design, Resource allocation in cellular networks.

Education

Virginia Tech., USA 2015-Present

Pursuing Ph.D. in Electrical and Computer Engineering (currently in third year).

- Advisor: Dr. Harpreet S. Dhillon
- Current Research Project: Joint Backhaul and Radio Access Design for Heterogeneous Wireless Networks
- Current GPA: 3.85

Jadavpur University, India 2011-2015

B.E. in Electronics and Telecommunication Engineering.

- Final year Project Topic: Gesture driven control of an Arduino based robot using Kinect
- Advisor: Dr. Amit Konar
- CGPA: 9.22

PhD Research

- **Spatial Modeling of Heterogeneous Cellular Networks**
  - Proposed Poisson cluster process based modeling of HetNets
  - Derived coverage probability for different 3GPP HetNet configurations

Graduate Level Projects

- Performance Analysis of Uplink Massive MIMO with Time Reversal Maximal Ratio Combining
- Software Design of Digital Transmitter and Receiver
- Fitting Point Processes to Cellular Network Topology

Previous Research Experience

- **Summer Intern** May 2014-Jul. 2014
  National University of Singapore
  Project: multi-objective optimization algorithms for application in day-ahead thermal scheduling
- **Intern** Dec. 2013-Jan. 2014
  Indian Institute of Technology, Delhi
  Project: Application of evolutionary computation and perceptron networks in biometric systems
- **Undergraduate Research** Dec. 2012-May 2014
  Indian Statistical Institute, Kolkata Project: Designing dynamic constraint optimization algorithms

Journal Publications

[J6] **C. Saha**, M. Afshang, H. S. Dhillon, "3GPP-inspired HetNet Model using Poisson Cluster Process: Sum-product Functionals and Downlink Coverage", submitted, May. 2017, available online: arxiv.org/abs/1705.01699.

[J5] M. Afshang, **C. Saha**, and H. S. Dhillon, "Nearest-Neighbor and Contact Distance Distributions for Matérn Cluster Process", in *IEEE Communications Letters*, to appear.

[J4] M. Afshang, **C. Saha**, H. S. Dhillon, "Nearest-Neighbor and Contact Distance Distributions for Thomas Cluster Process", in *IEEE Wireless Communications Letters*, Dec. 2016.

[J3] **C. Saha**, M. Afshang, and H. S. Dhillon, "Enriched K-Tier HetNet Model to Enable the Analysis of User-Centric Small Cell Deployments", in *IEEE Transactions on Wireless Communications*, Mar. 2016.

[J2] **C. Saha**, K. Pal, S. Mukherjee, S. Das, "A Fuzzy Rule Based Penalty Function Approach For solving Constrained Optimization", in *IEEE Transactions on IEEE Transactions on Cybernetics*, Dec. 2016.

[J1] A. Trivedi, D. Srinivasan, K. Pal, **C. Saha** and T. Reindl, "Enhanced Multiobjective Evolutionary Algorithm Based on Decomposition for Solving the Unit Commitment Problem," in *IEEE Transactions on Industrial Informatics*, Dec. 2015.

Conference Publications

[C6] **C. Saha**, M. Afshang, and H. S. Dhillon, "Integrated mmWave Access and Backhaul in 5G: Bandwidth Partitioning and Downlink Analysis," submitted, October 2017, available online: arxiv.org/abs/1710.06255.

[C5] **C. Saha**, M. Afshang, and H. S. Dhillon, "Poisson cluster process: Bridging the gap between PPP and 3GPP hetnet models," in Proc., Information Theory and Applications (ITA), 2017, available online: arXiv.org/abs/1702.05706.

[C4] **C. Saha** and H. S. Dhillon, "D2D underlaid cellular networks with user clusters: Load balancing and downlink rate analysis," *IEEE Wireless Communications and Networking Conference (WCNC)*, San Fransisco, CA, Mar. 2017.

[C3] **C. Saha** and H. S. Dhillon, "Downlink coverage probability of K-tier HetNets with general non-uniform user distributions," 2016 *IEEE International Conference on Communications (ICC)*, Kuala Lumpur, 2016.

[C2] **C. Saha**, D. Goswami, S. Saha, A. Konar, A. Lekova and A. K. Nagar, "A novel gesture driven fuzzy interface system for car racing game," 2015 *IEEE International Conference on Fuzzy Systems (FUZZ-IEEE)*, Istanbul, 2015.

[C1] K. Pal, **C. Saha**, S. Das, C. A. Coello Coello, "Dynamic Constrained Optimization with offspring repair based Gravitational Search Algorithm", *IEEE Congress on Evolutionary Computation 2013 (IEEE CEC 2013), Cancún, Mexico, Jun., 2013*

Graduate Courses Undertaken

Multichannel communications, Stochastic signals and systems, Information theory, Advanced Digital Communication, Measure and Probability, Spatial Statistics Error Control Coding

Awards

Wireless@VT Fellowship, 2015.

Computer Skills

- **Programming Languages:** C, C++, R, MATLAB, Mathematica
- **Scripting Languages:** HTML5, LaTeX

Teaching Experience

Course Instructor of Electronic Circuits Laboratory in Viginia Tech Fall 2015-Spring-2016.

Reference

Harpreet S. Dhillon Assistant Professor Virginia Tech E-mail: hdhillon@vt.edu