AKHIL JALAN

Email: akhiljalan@berkeley.edu — **Website**: akhiljalan.github.io

EDUCATION

University of California, Berkeley *August 2015 - May 2019*
B.A. Applied Mathematics, Highest Honors *GPA: 3.95/4.00*

RESEARCH EXPERIENCE

The Structure of the Sandpile Group (Bachelor's Thesis) [1] Nov 2018 - May 2019
Advisor: Professor Nikhil Srivastava *Berkeley, CA*

- Reviewed four equivalent characterizations of the sandpile group of a graph from combinatorics, spectral graph theory and algebraic graph theory
- Proved lower bounds for the number of trivial invariant factors for the sandpile groups of the hypercube graph, grid graph, and products of graphs
- Numerically confirmed the exponential growth of the largest invariant factor of the sandpile groups for expander graphs as a function of vertices

Equity in the Facility Location Problem Jan 2018 - Aug 2019
Advisors: Professors Gireeja Ranade & Swati Gupta *Berkeley, CA*

- Computed scale factors and approximately optimal solutions for hospital openings with respect to 18 unique objective functions
- Found increase in user travel distance and nearby hospital burden in case study of local Alta Bates hospital closure
- Confirmed dependence of optimal hospital openings on 5 "degrees of freedom": equity metric, equity weight, capacity weight, grouping scheme, and equity aggregation scheme

Machine Learning in Wireless Communication Jan 2018 - Oct 2018
Advisor: Professor Anant Sahai *Berkeley, CA*

- Implemented feedforward neural networks to test simple quantization strategy in the Witsenhausen counterexample in decentralized control
- Simulated radio demoudulation with recurrent & feedforward neural networks, in low signal-to-noise ratio (SNR) settings

PUBLICATIONS

- **(Under Review) Equity Across Demographic Groups for the Facility Location Problem**
  Swati Gupta, **Akhil Jalan**, Gireeja Ranade, Helen Yang, Simon Zhuang
  Submitted to: Proceedings of the Conference on Fairness, Accountability, and Transparency. ACM, 2020.

- **Some New Numeric Results Concerning the Witsenhausen Counterexample**
  Vignesh Subramanian, Laura Brink, Nikunj Jain, Kailas Vodrahalli, **Akhil Jalan**, Nikhil Shinde, Anant Sahai. 2018 56th Annual Allerton Conference on Communication, Control, and Computing (Allerton). IEEE, 2018.

[1] Available at `https://akhiljalan.github.io/files/akhil_thesis_sandpile_group.pdf`

WORK EXPERIENCE

WeWork Aug 2019 - Present
Engineer, Research & Applied Sciences Team *Palo Alto, CA*

· Retrained location scoring ensemble model for office units, using an ensemble model of gradient boosted decision trees

Agari Jun 2018 - Aug 2018
Intern, Data Science Team *Foster City, CA*

· Designed and trained new component of email risk model via rule-based subject line analysis
· Finalized nickname impostor detection in email risk model and tested against 10 million+ emails in Spark clusters
· Tested high-dimensional word embeddings (word2vec, GloVe) for feature design in subject line analysis

SERVICE

Math Peer Advisor, UC Berkeley August 2018 - May 2019

· Prepared free workshop on professional development for first and second-year math majors
· Offered 60 hours of free tutoring and course advice to STEM undergraduates
· Designed informational pamphlets for prospective students in collaboration with department administrator and fellow peer advisors