ABISHEK SANKARARAMAN

Education

The University of Texas at Austin
Ph.D. (Applied Mathematics and Computer Science) Sep. 2013 - Sep 2019

- Thesis: Spatial Stochastic Models for Network Analysis

Indian Institute of Technology, Madras
B.Tech and M.Tech in Electrical Engineering, Minor in Mathematics Aug 2008 - May 2013

Employment

Amazon Web Services (AWS) Santa Clara, CA
Senior ML Scientist Jul 2023 - Present
Applied Scientist Aug 2020 - May 2023

- Lead Scientist in the conceptualization, algorithm design, execution, launch, ongoing operations and future innovations for GuardDuty for RDS Protection. This service detects security threats on databases in real-time threat through anomaly detection algorithms on telemtry data-streams. This service is among the fastest growing AWS services generating X-MM $ month-over-month revenue within a few months of launch.
- Driving vertical buisness outcomes by partnering with other scientists, engineering and product stake-holders through design and execution for managed database services.
- Driving horizontal scientific projects on non-stationary, real time ML, to power innovations in future AWS offerings. This has resulted in several top-tier papers both as first author of my own research and in a second-author role by guiding interns and junior scientists.

University of California, Berkeley Berkeley,CA
Postdoctoral Researcher, Advisor: Venkat Anantharam Sep 2019 - Jul 2020

- Lead scientist through the design and execution of a novel research program on multi-agent reinforcement learning resulting in multiple, first author papers in top ML conferences.
- Mentored PhD students by scoping research projects and aiding in publication as a second-author.

Peer-Reviewed Conference Papers

Online Adaptive Anomaly Thresholding with Confidence Sequences,
Sophia Huiwen Sun, Abishek Sankararaman, Balakrishnan (Murali) Narayanaswamy
ICML 2024 *(Acceptance Rate 27%)*

Online robust non-stationary estimation,
Abishek Sankararaman, Balakrishnan (Murali) Narayanaswamy
NeurIPS 2023 *(Acceptance Rate 26%)*

Double Auctions with Two-sided Bandit Feedback, ,
Soumya Basu, Abishek Sankararamany
NeurIPS 2023 *(Acceptance Rate 26%)*

Online heavy-tailed change point detection,
Abishek Sankararaman, Balakrishnan (Murali) Narayanaswamy
UAI 2023 *(Acceptance Rate 30%)*

FITNESS (Fine Tune on New and Similar Samples) to detect online anomalies on streams with drift and outliers,
Abishek Sankararaman, Balakrishnan (Murali) Narayanaswamy, Vikramank Singh, Zhao Song
ICML 2022 *(Acceptance Rate 19%)*

Breaking the $\sqrt{T}$ Barrier: Instance Independent Logarithmic Regret for Contextual Bandits,
Avishek Ghosh, Abishek Sankararaman,
ICML 2022 *(Acceptance Rate 19%)*

Multi-agent Heterogeneous Stochastic Linear Bandits,
Avishek Ghosh, Abishek Sankararaman (Joint First Authors) and Kannan Ramachandran
ECML-PKDD 2022 *(Acceptance Rate 27%)*

Beyond $\log^2(T)$ Regret in Decentralized Matching Bandits,
Soumya Basu, Karthik Abinav Sankararaman and Abishek Sankararaman,
ICML 2021 *(Acceptance Rate 21%)*

Dominate or Delete: Decentralized Competing Bandits in Serial Dictatorship,
Abishek Sankararaman, Soumya Basu (Joint First Authors) and Karthik Abinav Sankararaman
AISTATS 2021 *(Acceptance Rate 27%)*

Problem-Complexity Adaptive Model Selection for Stochastic Linear Bandits,
Avishek Ghosh, Abishek Sankararaman and Kannan Ramachandran
AISTATS 2021 *(Acceptance Rate 27%)*

The Gossiping Insert-Eliminate Algorithm for Multi Agent Multi Armed Bandits
Ronshee Chawla*, Abishek Sankararaman*, Ayalvadi Ganesh and Sanjay Shakkottai
AISTATS 2020 [Joint First Authors] *(Acceptance Rate 20%)*

Social Learning in Multi-Agent Multi-Armed Bandit Problem
Abishek Sankararaman, Ayalvadi Ganesh and Sanjay Shakkottai
ACM SIGMETRICS 2020 *(Acceptance Rate 20%)*

Stability and Scalability of Blockchain Systems
Aditya Gopalan, Abishek Sankararaman, Anwar Walid and Sriram Vishwanath
ACM SIGMETRICS 2020 *(Acceptance Rate 20%)*

ComHapDet: A Spatial Community Detection Algorithm for Haplotype Assembly
Abishek Sankararaman, Haris Vikalo and François Baccelli
ACM CNB-MAC 2019. *(Acceptance Rate 30%)*

Community Detection on Euclidean Random Graphs
Abishek Sankararaman, Emmanuel Abbe and François Baccelli
ACM-SIAM Symposium on Discrete Algorithms (SODA), 2018. *(Acceptance Rate 20%)*

Spatial Birth-Death Wireless Networks
Abishek Sankararaman and François Baccelli
Allerton, October 2016. *(Acceptance Rate 35%)*

Performance-Oriented Association in Large Cellular Networks with Technology Diversity
Abishek Sankararaman, Jeong woo Cho and François Baccelli
International Teletraffic Congress (ITC), 2016. *(Acceptance Rate 25%)*

CSMA k-SIC: A class of distributed MAC protocols and their performance evaluation
Abishek Sankararaman and François Baccelli
IEEE Conference on Computer Communications (INFOCOM), 2015. *(Acceptance Rate 19%)*

Congestion Control of Smart Distribution Grids using State Estimation
Abishek Sankararaman and Balakrishnan Narayanaswamy
IEEE COMSNETS, E6 Workshop, 2013. *(Acceptance Rate 40%)*

Journal Papers

Decentralized Competing Bandits in Non-Stationary Matching Markets,
Avishek Ghosh, Abishek Sankararaman, Kannan Ramchandran, Tara Javidi, Arya Mazumdar
IEEE Transactions in Information Theory, 2024.

Model Selection for Generic Contextual Bandits,
Avishek Ghosh, Abishek Sankararaman and Kannan Ramachandran
IEEE Transactions on Information Theory, 2023.

Multi-Agent Low-Dimensional Linear Bandits
Ronshee Chawla, Abishek Sankararaman, Sanjay Shakkottai
IEEE Transactions on Automatic Control, 2022.

Ergodicity and steady state analysis for Interference Queueing Networks
Sayan Banerjee, Abishek Sankararaman,
AMS Contemporary Mathematics: Special volume in honor of M. M. Rao, 2021.

Stability and Scalability of Blockchain Systems
Aditya Gopalan, A. Sankararaman, Anwar Walid and Sriram Vishwanath
Proceedings of the ACM on Measurement and Analysis of Computing Systems (POMACS), June 2020.

Community Detection on Euclidean Random Graphs
A.Sankararaman, Emmanuel Abbe and François Baccelli
Information and Inference : A journal of the IMA, June 2020.

ComHapDet: A Spatial Community Detection Algorithm for Haplotype Assembly
A. Sankararaman, Haris Vikalo and François Baccelli
BMC Genomics, 2020.

Social Learning in Multi-Agent Multi-Armed Bandit Problem
A. Sankararaman, Ayalvadi Ganesh and Sanjay Shakkottai
Proceedings of the ACM on Measurement and Analysis of Computing Systems (POMACS), Dec 2019.

Interference Queueing Networks on Grids
A. Sankararaman, François Baccelli and Sergey Foss
Annals of Applied Probability, October 2019, Vol. 29, No. 5, 2929-2987.

Spatial Birth-Death Wireless Networks
A.Sankararaman and François Baccelli
IEEE Transactions on Information Theory, June 2017, 63 (6), 3964-3982.

Awards

- Student Leadership Award, UT Austin, 2018.
- Conference Travel Awards - ACM SODA 2018, NeurIPS 2018, Stochastic Networks 2016, 2018
- DAAD WISE Scholar, 2011

Teaching and Mentorship

Advanced Probability - Inference and Learning, Teaching Assistant, Spring 2018
Probability and Stochastic Processes (Graduate), Teaching Assistant, Fall 2018
Duties include holding office hours, setting homework and exam problems.

Undergraduate Student Mentor - Mixing Times for Random Walks on Groups Spring 2018
Research supervisor for an undergraduate student project in the Mathematics Department in Probability

Invited and Contributed Talks

- *Interference Queuing Networks on Grids*
  Talk at INFORMS Applied Probability Society, Brisbane, Australia. Jul 2019
  Talk at UNC-Chapel Hill Probability Seminar, Chapel Hill, NC. Feb 2019
  Talk at Austin-TAMU Probability Seminar, Austin, TX. May 2018
  Talk at Heriot-Watt University, Edinburgh UK Feb 2018

- *Community Detection on Euclidean Random Graphs*
  Talk at AMS Special Session on Stochastic Spatial Models, at the 2020 Joint Mathematics Meeting, Denver CO Jan 2020
  Talk at MIT Research Laboratory of Electronics, Cambridge MA Dec 2018
  Talk at University of Massachusetts, Amherst, MA Dec 2018
  Talk at Indian Institute of Technology Madras, Chennai Jan 2018

  Talk at ACM-SIAM SODA Conference, New Orleans, LA Jan 2018
  Talk at The University of Texas at Austin May 2017

- *Spatial Birth Death Process on the Continuum*
  Talk at Indian Institute of Technology Madras, Chennai Jan 2017
  Talk at Princeton University Nov 2016
  Talk at Allerton Conference on Communication Control and Computing Oct 2016
  Talk at INRIA - Ecole Normale Supérieure, Paris Sep 2016

- *Technology Diversity - A Framework for Base Station Association in Large Cellular Networks*
  Talk at 28th, International Teletraffic Congress (ITC-28), Würzburg, Germany Sep 2016

- *CSMA k-SIC: A Class of MAC Protocols*
  Talk at IEEE INFOCOM, Hong Kong May 2015

Professional Services

- Reviewer for Journal of Applied Probability (JAP), 2019-2020
- Organizer for Random Structures Seminar at UT Austin Math dept. 2017-2019
- Reviewer for IEEE ISIT (International Symposium on Information Theory) 2019
- Reviewer for Queueing Systems Journal 2019
- Reviewer for ACM-SIAM SODA (Symposium on Discrete Algorithms) 2019
- Reviewer for IEEE FOCS (Foundations of Computer Science) 2018
- Reviewer for SpaSWIN (Spatial Stochastic Models for Wireless Networks) 2018
- Reviewer for Performance Evaluation 2017
- Reviewer for IEEE Transactions on Information Theory 2016-2019
- Reviewer for IEEE Transactions on Wireless Communications 2015-2019