SOUMYA BASU

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EDUCATION

The University of Texas at Austin, USA — Aug 2014 - Present
PhD in Decision, Information, and Communication Engineering — CGPA: 3.822/4
Adviser: Prof. Sanjay Shakkottai and Prof. Evdokia Nikolova

Indian Institute of Technology, India — Jul 2009 - May 2014
B.tech(Hons) in Electronics and Electrical Communication Engineering — CGPA: 9.53/10
M.Tech in Telecommunication Systems Engineering
Adviser: Prof. Goutam Das

RESEARCH INTEREST

Online Learning: Combinatorial Bandits, Optimal Resource Allocation in Queuing Networks
Machine Learning Theory: Stochastic Optimization, Unsupervised Learning, Graphical Models

PUBLICATIONS AND WORKING PAPERS

Conference

- **S. Basu**, R. Sen, S. Sanhgavi, and S. Shakkottai. "Blocking Bandits". In: *NEURIPS*. PMLR. 2019
- **S. Basu**, S. Gutstein, B. Lance, and S. Shakkottai. "Pareto Optimal Streaming Unsupervised Classification". In: *ICML*. PMLR. 2019
- **S. Basu** and S. Shakkottai. "Switching Constrained Max-Weight Scheduling for Wireless Networks". In: *INFOCOM*. IEEE. 2019
- **S. Basu**, A. Sundarrajan, J. Ghaderi, S. Shakkottai, and R. Sitaraman. "Adaptive TTL-Based Caching for Content Delivery". In: *SIGMETRICS*. ACM. 2017
- **S. Basu**, G. Yang, T. Lianeas, E. Nikolova, and Y. Chen. "Reconciling selfish routing with social good". In: *SAGT*. Springer. 2017
- A. Khodabakhsh, G. Yang, **S. Basu**, E. Nikolova, M. C. Caramanis, T. Lianeas, and E. Pountourakis. "A Submodular Approach for Electricity Distribution Network Reconfiguration". In: *HICSS*. 2018
- **S. Basu**, T. Lianeas, and E. Nikolova. "New Complexity Results and Algorithms for the Minimum Tollbooth Problem". In: *Web and Internet Economics*. Springer, 2015
- **S. Basu**, M. Ahmadi, M. Ni, and J. Pan. "Locating primary users in cognitive radio networks by generalized method of moments". In: *GLOBECOM, 2014*. IEEE. 2014

Journal

- **S. Basu**, A. Sundarrajan, J. Ghaderi, S. Shakkottai, and R. Sitaraman. "Adaptive TTL-Based Caching for Content Delivery". In: *IEEE/ACM Transactions on Networking* (2018)
- **S. Basu** and G. Das. "Scheduling Hybrid WDM/TDM Ethernet Passive Optical Networks Using Modified Stable Matching Algorithm". In: *Journal of Lightwave Technology* (2014)

Working Papers

- J. Hoffmann, **S. Basu**, S. Goel, and C. Caramanis. "Disentangling Mixtures of Epidemics on Graphs". In: Under progress, 2019
- **S. Basu** and S. Shakkottai. "Constant Regret in Throughput-optimal Scheduling". In: Ongoing

SCHOLASTIC ACHIEVEMENTS

Institute Silver Medal, 2014 for best academic performance in E&ECE Dual, IIT Kharagpur
Best M.Tech Thesis, 2014 in E&ECE, IIT Kharagpur
JBNSTS Scholar, 2010, **DAAD WISE** Scholar, 2012 & **MITACS** Scholar 2013

TECHNICAL STRENGTHS

Programming: Python (Pyspark, Pytorch, Pandas), C, C++, SQL **Computation:** MATLAB

INTERNSHIPS

Software Engineering Intern at Facebook, Menlo Park, USA Summer 2019
Cache placement optimization for improved latency performance

Performance Engineering Intern at Akamai, Cambridge, USA Summer 2017
Real-time *TCP mode selection* using cellular connectivity data for mobile users
Understanding the effect of *user features* on data throughput under different TCP modes

Research Intern at Panlab, CS, University of Victoria, BC Summer 2013
Cognitive User based Primary User Localization in Cognitive Radio Network
Designed *general method of moments* based location estimator using SINR information

Research Intern at EDA Chair, ECE, Technische Universität Munich Summer 2012
Modular Direct Memory Access Controller design with WISHBONE protocol

RELEVANT COURSEWORK

Machine Learning:	Large Scale Optimization, Learning with Big-Data, Unsupervised Learning, Big-Data using Spark (edX), Deep Learning Specialization (Coursera)
Network Analysis:	Advanced Probability in Learning and Networks, Mixing Time in Markov Chains, Information Theory, Communication Networks: Analysis and Design
Algorithms:	Advanced Data structures, Approximation Algorithms, Graph Theory Theory of Computation, Distributed Algorithms, Adaptive Signal Processing

SELECTED RESEARCH PROJECTS

Disentangling Mixtures of Epidemics on Graphs Feb 2019-May 2019
Recovering mixture of two weighted graphs from independent samples of SIR epidemics
Discovering recoverability conditions and designing sample and time efficient algorithms

Blocking Bandits Jan 2019- May 2019
Studying multi armed bandit problem with blocking of arms after respective plays
Proving computational hardness and $(1 - 1/e)$ greedy approximation of optimal play
Designing Greedy UCB and leveraging free exploration for improved regret bounds

Pareto Optimal Streaming Unsupervised Ensemble Learning Oct 2017 - Jan 2019
Joint routing and label-aggregation algorithms for unsupervised ensemble learning
Using explore-exploit strategy to learn hidden parameters through Tensor decomposition
Designing two-staged Back-pressure algorithm with hidden transitions for system stability

Augmented Max-weight with Learning for Wireless Networks March 2017-Oct 2017
Designing algorithm for optimizing switching and operational cost with stability constraints
Designing fallback aided explore-exploit strategy for online learning of channel model
Providing non-asymptotic MGF bounds for quantifying queue length tail distribution

Adaptive TTL-Based Caching for Content Delivery April 2016- Feb 2017
Achieving Cache hitrate with dynamic multi level TTL caches - verification on 'Akamai' traces

EXTRA CURRICULAR ACTIVITIES

Overnite by ACM/ICPS at Kshitij 2012: Secured 8th position (out of more than 70 teams)
Literacy Drive, National Social Service Scheme: Tutored underprivileged students
Cultural Championships, IIT Kharagpur: Captain of *Finearts*, and member in *Dramatics* events