SOUMYA BASU

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EDUCATION

University of Texas at Austin   *Aug 2014 - Present*
PhD in Decision, Information, and Communication Engineering   CGPA: 3.807/4
Adviser: Prof. Sanjay Shakkottai and Prof. Evdokia Nikolova

Indian Institute of Technology, Kharagpur   *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

Reinforcement Learning in stochastic networks with stability and optimality guarantees.
Mechanism design with a focus on risk averse users.
Approximation algorithms and Hardness results and in optimization; non-linear and non convex.

PUBLICATIONS AND WORKING PAPERS

Conference
Soumya Basu et al. "Adaptive TTL-Based Caching for Content Delivery". In: *Proceedings of the 2017 ACM SIGMETRICS/International Conference on Measurement and Modeling of Computer Systems.* ACM. 2017, pp. 45–46

Soumya Basu, Thanasis Lianeas, and Evdokia Nikolova. "New Complexity Results and Algorithms for the Minimum Tollbooth Problem". In: *Web and Internet Economics.* Springer, 2015, In Press

Soumya Basu et al. "Locating primary users in cognitive radio networks by generalized method of moments". In: *GLOBECOM, 2014.* IEEE. 2014

Soumya Basu et al. "Reconciling selfish routing with social good". In: *International Symposium on Algorithmic Game Theory.* Springer. 2017, pp. 147–159

Journal
Soumya Basu and Goutam Das. "Scheduling Hybrid WDM/TDM Ethernet Passive Optical Networks Using Modified Stable Matching Algorithm". In: *Journal of Lightwave Technology* (2014)

Soumya Basu et al. "Adaptive TTL-Based Caching for Content Delivery". In: *IEEE/ACM Transactions on Networking* (2018)

Working Papers
Soumya Basu and Sanjay Shakkottai. "Augmented Max-weight and Learning in Wireless Networks". In: 2017, Submitted

Soumya Basu, Sanjay Shakkottai, and Steven Gutstein. "Streaming Unsupervised Ensemble Learning". In: 2018, In Progress

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, C, C++
Computation   MATLAB, Mathematica, CPLEX

RELEVANT COURSEWORK

Network Modeling & Analysis: Advanced Prob. in Learning and Networks, Markov Chains and Mixing Time, Theory of Prob., Information Theory, Comm. Networks: Analysis and Design.
Machine Learning: Large Scale Optimization, Learning with Big-Data, Big-Data using Spark (edX).
Algorithms: Advanced Data structures, Approximation Algorithms, Graph Theory, Theory of Computation, Distributed Algorithms, Adaptive Systems and Signal Processing.

RESEARCH PROJECTS

Augmented Max-weight with Learning for Wireless Networks   March 2017-Oct 2018
Designing algorithm for optimizing switching and operational cost with stability constraints.

Mechanism Design for Risk Averse Routing   Oct 2016-Present
Mechanism design in non-linear and non-separable routing games with path tolls.

Adaptive TTL-Based Caching for Content Delivery   April 2016- Feb 2017
Achieving Cache hitrate with Actor-Critic Reinforcement Learning - verification on 'Akamai' traces.

Reconciling Selfish Routing with Social Good   July 2015-July 2016
Effects of path decomposition on routing games: fairness, optimality and computation.

Algorithms in Minimum Tollbooth Problem (MINTB)   Dec 2014-July 2015
Designing road tolls with minimum support; approximation hardness and algorithms.

Design of Ethernet Passive Optical Network over Coax(EPoC)   July 2013-July 2014
Integration of CSMA/CD on Coax and TDMA on optical network with high performance guarantees.

Hybrid TDM/WDM scheduling in Ethernet Passive Optical Network Sept 2012-May 2013
Pareto optimal Dynamic Bandwidth Assignment (DBA) in EPON in presence of laser tuning time.

INTERNSHIPS

Performance Engineering Intern at Akamai, Cambridge, USA.   Summer 2017
TCP performance improvement in networks with cellular last mile.
TCP mode selection algorithm using real time cellular connectivity data.

Research Intern at Panlab, CS, University of Victoria, BC.   Summer 2013
Cognitive User based Primary User Localization in Cognitive Radio Network.

Research Intern at EDA Chair, ECE, Technische Universität Munich.   Summer 2012
Modular Direct Memory Access Controller Design.

TECHNICAL PROJECTS

Machine Learning: Epileptic Seizure Detection using **State Vector Machine(SVM)** , Customer Satisfaction Prediction **Kaggle Santander** .

Distributed Systems: Stable Song Directory using **Three Phase Commit** , Multi-user Chatroom using **PAXOS** , Gossip based Eventually Consistent Database, **Bayou**

EXTRA CURRICULAR ACTIVITIES

Overnite by ACM/ICPC at Kshitij 2012: Secured 8th position (out of more than 70 teams).
Literacy Drive Team of National Social Service Scheme:
Conducted weekly teaching in underprivileged regions in Kharagpur, India.
Social Cultural Championships, IIT Kharagpur:
Captain of Medal winning team in **Finearts** and active member of **Dramatics** team.