Vishrant Tripathi

32-D671, MIT
✉ *vishrant@mit.edu*
🖺 *www.mit.edu/~vishrant*
Expected Graduation Date: 08/23

Education

Ongoing	**PhD**, *Electrical Engineering and Computer Science*, Minor in Economics, Massachusetts Institute of Technology (MIT) Laboratory for Information and Decision Systems (LIDS) Advisor: **Prof. Eytan Modiano**.
2017 to 2019	**SM**, *Electrical Engineering and Computer Science*, Massachusetts Institute of Technology (MIT) GPA - **5.0**/5.0, Thesis title - "Age of Information & Mobility" Advisor: **Prof. Eytan Modiano**.
2013 to 2017	**Bachelors of Technology (B.Tech.)**, *Electrical Engineering*, Indian Institute of Technology, Bombay (IIT-B) GPA - **9.63**/10.0, Minor in Computer Science Advisor: **Prof. Sharayu Moharir**.

Interests

Communication Networks, Control and Optimization, Machine Learning, Information Theory.

Selected Publications

- "**Optimizing Age of Information with Correlated Sources**" - VT, E. Modiano; ACM Mobihoc 2022, Best Paper Runner Up Award.
- "**Information Freshness in Multi-Hop Wireless Networks**" - VT, E. Modiano; IEEE/ACM Transactions on Networking 2022.
- "**Computation and Communication Co-Design for Real-Time Monitoring and Control in Multi-Agent Systems**" - VT, L. Ballotta, L. Carlone, E. Modiano; IFIP WiOpt 2021.
- "**An Online Learning Approach to Optimizing Time-Varying Costs of AoI**" - VT, E. Modiano; ACM MobiHoc 2021.
- "**A Whittle Index Approach to Minimizing Functions of Age of Information**" - VT, E. Modiano; Allerton Conference on Communication, Control, and Computing, 2019
- "**Age Optimal Information Gathering and Dissemination on Graphs**" - VT, R. Talak, E. Modiano; IEEE Infocom 2019.
- "**Age of Information and Mobility**" - VT; SM Thesis, MIT, 2019.
- "**Age of Information in Multi-Source Systems**" - VT, S. Moharir; IEEE GlobeCom 2017.

Experience

Fall'17 to Present	**Research Assistant**, *Communications and Networking Research Group, LIDS*, MIT. ○ Use tools from probability, optimization, and learning to formulate and solve problems in networking and control ○ Design new network control policies to achieve timely information delivery in wireless networks for real-time applications ○ Apply our fundamental theory results to IoT, robotics, edge computing and cloud systems
Summer'22	**Software Engineering Intern**, *GCloud Tech Infra*, Google, New York. ○ Worked on Sinapse2 - a real-time observed networked modeling system for traffic management in Google's network ○ Designed and built an input replayer for this system for debugging, recreating network behavior during past events and improving fail-static policies
Summer'21	**Research Engineering Intern**, *Capacity Engineering and Analysis*, Facebook, Menlo Park. ○ Worked on a large scale mixed-integer linear programming (MILP) solver, used for long term capacity planning ○ Added detailed constraint tracking and sensitivity analysis to provide deeper insights and interpretability for this solver ○ Proposed an efficient way to perform sensitivity analysis for multiple groups of constraints in a MILP

Spring'19,21; Fall'22	**Teaching Assistant**, MIT.
	○ 16.36 (Communication Systems and Networks): ran a Software Defined Radio (SDR) lab with experiments covering sampling, modulation, interference and practical aspects of wireless communication, rated 7.0/7.0.
	○ 6.7700 (Fundamentals of Probability): taught measure-theoretic probability to first year graduate students in EECS.
Summer'16	**Internship**, *Second Order Risk Group, Global Markets, Deutsche Bank*, Mumbai.
	○ Built an analytical and reporting tool to help understand the funding costs of new regulations, which affect the exchange of initial margins on derivatives
Fall'15	**Teaching Assistant**, IIT-B.
	○ Taught introductory quantum physics to a class of 40 freshmen
Summer'15	**Research Assistant**, *Embedded Systems Lab, Prof. M. Shojaei*, IIT-B.
	○ Worked on a custom embedded system for bio-medical signal acquisition and processing
	○ Implemented algorithms for noise cancellation and motion artifact reduction of ECG and EEG signals

Relevant Coursework

At MIT	○ **Probability/Stats** - Fundamentals of Probability, Advanced Stochastic Processes, Inference and Information, High-dimensional Statistics.
	○ **Optimization/ML** - Math. Programming, Algebraic & Semidefinite optimization, Machine Learning.
	○ **Networks/Control** - Data Networks (Theory), Computer Networks (Systems), Dynamic Systems and Control
	○ **Others** - Algorithmic Game Theory, Foundations of Development Policy, Collective Choice and Political Economy, Kaufman Teaching Certificate Program.
At IIT-B	○ Information Theory, Optimization Algorithms, Queuing Theory, Reinforcement Learning, Geometric Algorithms, Introduction to Game Theory, Microeconomics.

Programming Skills

Languages	**Proficient**: Python, MATLAB, C/C++, LaTeX **Familiar**: SQL, Verilog, Javascript, CSS.
Platforms	Labview/Simulink, GNURadio.

Fellowships and Awards

○ **All India Rank 126** in the Join Entrance Exam (JEE) Advanced 2013, amongst 1.3 million candidates
○ **Institute Academic Prize**, IIT-Bombay (given to 10 students among 880) for 2015-16
○ **Kishore Vaigyanik Protsahan Yojana (KVPY)** fellowship with an **All India Rank of 30**
○ Invited by the Govt. of India to view the 62nd **Republic Day Parade** for excellent academic performance at the high school level
○ **National Talent Search Examination (NTSE)** scholar

Professional Service

○ Co-chair for the LIDS Student Conference, MIT, 2020
○ Reviewer for the following IEEE journals
  - Transactions on Networking (ToN),
  - Transactions on Mobile Computing (TMC),
  - Transactions on Communications (TCOM),
  - Internet of Things Journal (IoT),
  - Journal on Selected Areas in Communications (JSAC), and
  - Transactions on Wireless Communications (TWC)
○ Reviewer for IEEE GlobeCom 2022
○ Reviewer for IEEE International Symposium on Information Theory (ISIT) 2019 & 2020
○ Reviewer for IEEE INFOCOM Workshop on Age of Information, 2019
○ Co-organizer of LIDS & Stats Tea Talks at MIT, 2019
○ Treasurer of the MIT Cricket Club