Virag Shah

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Management Science and Engineering
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https://virags.github.io

Education

2010-2015 **PhD**, *The University of Texas at Austin*, Electrical and Computer Engineering.
2007–2009 **M.E.**, *Indian Institute of Science, Bangalore*, Electrical and Comm. Engineering.
2003–2007 **B.E.**, *Mumbai University*, Electronics Engineering.

Employment

Since 2017 **Stanford University**, *Stanford*, CA.
Postdoctoral Research Scholar. Hosts: Jose Blanchet and Ramesh Johari.

2017 **Indian Institute of Technology (IIT) Bombay**, *Mumbai*, India.
Visiting Faculty.

2016-2017 **Microsoft Research-INRIA Joint Center**, *Paris*, France.
Postdoctoral Research Scholar. Host: Laurent Massoulié.

2015 **The University of Texas at Austin**, *Austin*, Tx.
Simons Postdoctoral Fellow. Host: François Baccelli.

2013 **Nokia Bell Labs**, *Crawford Hill*, NJ.
Research Intern.

2009-2010 **Indian Institute of Technology (IIT) Bombay**, *Mumbai*, India.
Research Fellow.

Research interests

I develop models and algorithms for online platforms which address the tradeoffs between exploration to reduce uncertainty, and exploitation for instantaneous and future benefits. Multi-armed bandits, revenue management, queueing theory, and learning.

Recent works

- Bandit learning with positive externalities. V. Shah, R. Johari, J. Blanchet.
  - Accepted at NIPS 2018.
  - Preliminary version presented at ICML Workshop on Causal ML, 2018.
  - To be presented at INFORMS 2018.
- Adaptive matching algorithms for expert systems with uncertain task types. V. Shah, L. Gulikers, L. Massoulie, M. Vojnovic.
  - Under review at Operations Research journal. Major Revision.
  - Preliminary version presented at Allerton conference, 2017.
  - To be presented at INFORMS 2018.
- Optimal testing in the experiment-rich regime. S. Schmit, V. Shah, R. Johari. Submitted. Preliminary version presented at ICML Workshop on Causal ML, 2018.
- Semi-parametric dynamic contextual pricing. V. Shah, R. Johari, J. Blanchet. In the works.

Awards

- Best Paper Award, IEEE INFOCOM 2014 at Toronto, Canada. 1650 papers submitted, and 313 papers accepted to the conference.
- MCD Fellowship at The University of Texas at Austin, 2010-11. Awarded to about top 1% applicants at the graduate school.
- Best Paper Award, NCC 2010 at IIT Madras, India. 250 papers submitted, and 105 accepted to conference.

Teaching experience

2013 **The University of Texas at Austin**.
Teaching Assistant. Graduate course on Probability and Stochastic Processes.

Programming Languages

- Python, C, Matlab

References

- François Baccelli — UT Austin, `baccelli@math.utexas.edu`
- Jose Blanchet — Stanford University, `jose.blanchet@stanford.edu`
- Ramesh Johari — Stanford University, `rjohari@stanford.edu`
- Laurent Massoulié — MSR/INRIA, `laurent.massoulie@inria.fr`
- Gustavo de Veciana — UT Austin, `gustavo@ece.utexas.edu`

Journal papers

- T. Bonald, C. Comte, V. Shah, G. de Veciana, "Poly-symmetry in processor-sharing systems," *Queuing Systems* (QUESTA), accepted, 2017.
- V. Shah, G. de Veciana, and G. Kesidis "A stable approach for routing queries in unstructured P2P networks," *IEEE/ACM Trans. on Networking* (ToN), Oct. 2016.
- V. Shah and G. de Veciana, "Impact of fairness and heterogeneity on delays in large-scale content delivery systems," *Queuing Systems* (QUESTA), Aug. 2016.
- V. Shah and G. de Veciana, "Asymptotic independence of servers' utilization in queuing systems with limited resource pooling," *Queuing Systems* (QUESTA), Jun. 2016.
- V. Shah and G. de Veciana, "High performance centralized content delivery infrastructure: models and asymptotics," *IEEE/ACM Trans. on Networking* (ToN), Oct. 2015.
- V. Shah, B. K. Dey, and D. Manjunath, "Network flows for functions," *IEEE J. on Selected Areas in Comm.* (JSAC) Special Issue on In-Network Computation, Mar. 2013.
- V. Shah, N. B. Mehta, and D. Bethanabhotla, "Performance of a Fast, Distributed Multiple Access Based Relay Selection Algorithm Under Imperfect Statistical Knowledge", *IEEE Trans. on Wireless Comm.* (TWC), Oct. 2011.

- V. Shah, N. B. Mehta, and R. Yim, "The relay selection and transmission tradeoff in cooperative communication systems," *IEEE Trans. on Wireless Comm.* (TWC), Aug. 2010.

- V. Shah, N. B. Mehta, and R. Yim, "Optimal timer based selection schemes," *IEEE Trans. on Comm.* (TCOM), Jun. 2010.

- V. Shah, N. B. Mehta, and R. Yim, "Splitting algorithms for fast relay selection: Generalizations, analysis, and a unified view," *IEEE Trans. on Wireless Comm.* (TWC), Apr. 2010.

Peer-reviewed conference papers

- V. Shah, R. Johari, J. Blanchet, "Bandit learning with positive externalities," in NIPS 2018.

- V. Shah, L. Gulikers, L. Massoulie, M. Vojnovic, "Adaptive matching algorithms for expert systems with uncertain task types," in Allerton Conference 2017.

- V. Shah, A. Bouillard, F. Baccelli, "Delay comparison of delivery and coding policies in data Clusters," in Allerton Conference 2017.

- V. Shah and G. de Veciana "Impact of fairness and heterogeneity on delays in large-scale content delivery systems," in ACM SIGMETRICS 2015.

- V. Shah and G. de Veciana "Performance evaluation and asymptotics for content delivery networks," in IEEE INFOCOM 2014.

- V. Shah, G. de Veciana, and G. Kesidis, "Learning to route queries in unstructured P2P networks: Achieving throughput optimality subject to query resolution constraints," in IEEE INFOCOM 2012.

- V. Shah, B. K. Dey, and D. Manjunath, "Efficient flow allocation algorithms for in-network function computation," in IEEE GLOBECOM 2011.

- V. Shah, B. K. Dey, and D. Manjunath, "Network flows for functions," in IEEE International Symposium of Information Theory (ISIT) 2011.

- V. Shah, N. B. Mehta, and R. Yim, "A complete characterization of an optimal timer based selection scheme," in IEEE International Conference on Communications (ICC) 2010.

- A. S. Teertha, N. B. Mehta, V. Shah, "On optimal timer-based distributed selection for rate-adaptive multi-user diversity systems," National Conference on Communications (NCC) 2010.

- V. Shah, N. B. Mehta, and R. Yim, "Relay selection and data transmission throughput tradeoff in cooperative systems," in IEEE GLOBECOM 2009.

- V. Shah, N. B. Mehta, and R. Yim, "Analysis, insights and generalization of a fast decentralized relay selection mechanism," in IEEE International Conference on Communications (ICC) 2009.