

Virag Shah

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Management Science and Engineering
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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.
- 2010-2015 **The University of Texas at Austin**, *Austin, Tx*.
MCD Fellow and Graduate Research Assistant. Advisor: Gustavo de Veciana.
- 2013 **Nokia Bell Labs**, *Crawford Hill, NJ*.
Research Intern. Hosts: T.V. Lakshman and Murali Kodialam
- 2009-2010 **Indian Institute of Technology (IIT) Bombay**, *Mumbai, India*.
Research Fellow. Hosts: D. Manjunath and Bikash K. Dey

Research interests

I develop models and algorithms for Internet platforms and cyber-physical systems which address the tradeoffs between exploration to reduce uncertainty, and exploitation for instantaneous and future benefits. Multi-armed bandits, revenue management, learning, and applied probability.

Recent works

- Bandit learning with positive externalities. V. Shah, J. Blanchet, R. Johari.
 - 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. Massoulié, 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.
 - Accepted at AISTATS 2019.
 - Preliminary version presented at ICML Workshop on Causal ML, 2018.
- Semi-parametric dynamic contextual pricing. V. Shah, J. Blanchet, R. Johari. To be submitted.

- Asymptotically Optimal Thickness of a Centralized Dynamic Matching Market with IID Utilities. J. Blanchet, M. Reiman, V. Shah, L. Wein. In preparation.

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

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|----------------------|---|
| ○ 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 |

Publications

Online platform revenue/resource management

- V. Shah, R. Johari, J. Blanchet, *Semi-parametric dynamic contextual pricing with binary observations*. To be submitted.
- J. Blanchet, M. Reiman, V. Shah, L. Wein, *Asymptotically Optimal Thickness of a Centralized Dynamic Matching Market with IID Utilities*. In preparation.
- V. Shah, J. Blanchet, R. Johari, *Bandit learning with positive externalities*. Accepted at NIPS (Neural Information Processing Systems) conference, 2018. Journal version in preparation.
- S. Schmit, V. Shah, R. Johari, *Optimal testing in the experiment-rich regime*. Accepted at AISTATS 2019.
- V. Shah, L. Gulikers, L. Massoulié, M. Vojnovic, *Adaptive matching algorithms for expert systems with uncertain task types*. Major Revision at Operations Research journal. Also presented at Allerton conference, 2017.

Network performance evaluation

- T. Bonald, C. Comte, V. Shah, G. de Veciana, *Poly-symmetry in processor-sharing systems*. Queuing

Systems 2017.

- V. Shah and G. de Veciana, *Impact of fairness and heterogeneity on delays in large-scale content delivery systems*, Queuing Systems 2016. Also presented at SIGMETRICS 2015.
- V. Shah, G. de Veciana, and G. Kesidis, *A stable approach for routing queries in unstructured P2P networks*. IEEE/ACM Trans. on Networking 2016. Also presented at INFOCOM 2012.
- V. Shah and G. de Veciana, *Asymptotic independence of servers' utilization in queuing systems with limited resource pooling*. Queuing Systems 2016.
- V. Shah and G. de Veciana, *High performance centralized content delivery infrastructure: models and asymptotics*. IEEE/ACM Trans. on Networking 2015. Also presented at INFOCOM 2014 **Best Paper Award**.
- V. Shah, B. K. Dey, and D. Manjunath, "Network flows for functions," IEEE JSAC Special Issue on In-Network Computation, Mar. 2013. Also presented in parts at IEEE Globecom 2011 and IEEE International Symposium of Information Theory (ISIT) 2011.

Wireless medium access control

- 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. 2011.
- V. Shah, N. B. Mehta, and R. Yim, *The relay selection and transmission tradeoff in cooperative communication systems*. IEEE Trans. on Wireless Comm. 2010. Also presented at IEEE GLOBECOM 2009.
- V. Shah, N. B. Mehta, and R. Yim, *Optimal timer based selection schemes*. IEEE Trans. on Comm. 2010. Also presented at IEEE International Conference on Comm. 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. Also presented at IEEE International Conference on Comm. 2009.
- A. S. Teertha, N. B. Mehta, V. Shah, "On optimal timer-based distributed selection for rate-adaptive multi-user diversity systems," National Conference on Comm. 2010 **Best Paper Award**.