Virag Shah

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Summary

- Active learning in online matching markets (1.5 yrs experience)
- System optimization and algorithm design for scalable cloud computing systems (6 yrs exp)

Education

Ph.D. in Electrical and Computer Engineering   2015
The University of Texas at Austin, USA

Master of Engineering in Telecommunications   2009
Indian Institute of Science (IISc), Bangalore, India

Bachelor of Engineering in Electronics   2007
Sardar Patel College of Engineering, Mumbai, India

Awards

- **Best Paper Award** at *IEEE INFOCOM*, 2014 at Toronto, Canada. One of two papers selected (tied) from the 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 by the graduate school.
- **Best Paper Award** at *National Conf. on Comm.* (NCC), 2010 at IIT Madras, India in communications track. 250 papers submitted, and 105 accepted to conference with 48 in communications track.

Research Experience

Microsoft Research-Inria Joint Centre   2016 - present
Active learning in online matching markets
Postdoctoral Researcher
Hosts: Drs. Laurent Massoulié, Marc Lelarge, and Milan Vojnović

- We develop online recommendation algorithms for job-worker matching platforms and Q&A platforms.
- A key feature of these applications is making decision under uncertainty in job types and worker skills. These are learned over time, in parallel with matching decisions in an optimal fashion.

The University of Texas at Austin   Fall 2015
Redundancy and tail latency in data clusters
Simons Postdoctoral Fellow
Host: Prof. François Baccelli

- We compare load balancing strategies which reduce tail latency by exploiting redundancy.
- We develop performance scaling laws and provide new insights into latency which are robust to statistical modeling assumptions.

The University of Texas at Austin   2010 - 2015
High performance and robustness in content delivery systems
MCD Fellow, Research Assistant
Advisor: Prof. Gustavo de Veciana

- We design service algorithms which offer substantial gains in download speeds while achieving robustness to load variations without requiring complex caching strategies.
- We provide a scalable performance model which enables disciplined engineering and study of performance-energy-reliability tradeoffs.
- With enough content diversity, we show that large systems exhibit a concentration property where several worst-case scenarios become unlikely, thus reducing the need for over-provisioning.

Alcatel-Lucent Bell Labs, New Jersey 2013
Location oblivious low latency data access in data centers
Summer Research Intern
Hosts: Dr. Murali Kodialam and Dr. T. V. Lakshman

- We design a data storage architecture that guarantees a fixed low latency for data access, irrespective of the location of the request, by distributing data among the different memory locations such that network bottlenecks are avoided.

Indian Institute of Technology, Bombay 2009 - 2010
In-network function computation via network flows
Research Fellow
Advisors: Prof. D. Manjunath and Prof. Bikash K. Dey

- We develop fast algorithms for distributed function computations over cloud networks with service constraints at nodes and capacity constraints at interconnecting links.

Indian Institute of Science, Bangalore 2007 - 2009
Distributed algorithms for wireless relay selection
Masters Research Project
Advisor: Prof. Neelesh B. Mehta

- We develop and optimize distributed algorithms for wireless cooperative relay selection and demonstrate an order of magnitude performance improvement over the state of the art.

Publications in works

- V. Shah, L. Gulikers, L. Massoulié, M. Vojnović, "Adaptive matching algorithms for expert systems with uncertain task types," submitted, 2017
- V. Shah, A. Bouillard, F. Baccelli, "Latency comparison of delivery and coding policies in data clusters," in works, 2017.

Journal publications

- T. Bonald, C. Comte, V. Shah, G. de Veciana, "Poly-symmetry in processor-sharing systems," *Queuing Systems* (QUESTA), 2017
- V. Shah and G. de Veciana, "Asymptotic independence of servers' utilization in queuing systems with limited resource pooling," *Queuing Systems* (QUESTA), 2016
- V. Shah, G. de Veciana, and G. Kesidis "A Stable Approach for Routing Queries in Unstructured P2P Networks," *IEEE/ACM Trans. on Networking* (ToN), 2016.
- V. Shah and G. de Veciana, "Impact of fairness and heterogeneity on delays in large-scale content delivery networks," *Queuing Systems* (QUESTA), 2016
- V. Shah and G. de Veciana, "High Performance Centralized Content Delivery Infrastructure: Models and Asymptotics," *IEEE/ACM Trans. on Networking* (ToN), 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 R. Yim, "Optimal timer based selection schemes," *IEEE Trans. on Comm.* (TCOM), June 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.

- 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.

Peer-reviewed conference publications

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

- V. Shah and G. de Veciana "Performance evaluation and asymptotics for content delivery networks," in IEEE INFOCOM, Apr. 2014. **(Best Paper Award)**

- 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, Mar. 2012.

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

- V. Shah, B. K. Dey, and D. Manjunath, "Efficient flow allocation algorithms for in-network function computation," in IEEE GLOBECOM, Dec. 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), May 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), India, Jan. 2010. **(Best Paper Award)**

- 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), June 2009.

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

Teaching experience

Probability and Stochastic Processes   Fall 2013
Teaching Assistant, The University of Texas at Austin
Instructor: Prof. Gustavo de Veciana

References

Prof. François Baccelli
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