Gauri Joshi

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EMPLOYMENT

Carnegie Mellon University	Sept 2017 – present
Assistant Professor of Electrical and Computer Engineering	Pittsburgh PA
IBM T. J. Watson Research Center	July 2016 – Aug 2017
Research Staff Member	Yorktown Heights NY

EDUCATION

Massachusetts Institute of Technology — Sept 2012– Jun 2016

Ph.D in Electrical Engineering & Computer Science, GPA 5.0/5.0 (minor in Finance)
Thesis: Using Redundancy to Reduce Latency in Cloud Systems
Committee: Gregory Wornell (advisor), Emina Soljanin, Devavrat Shah

Massachusetts Institute of Technology — Sept 2010– Jun 2012

S.M. in Electrical Engineering & Computer Science, GPA 5.0/5.0
Thesis: On Playback Delay in Streaming Communication — **Best Thesis Award**
Advisors: Gregory Wornell, Yuval Kochman

Indian Institute of Technology Bombay — Jul 2005–Jun 2010

B. Tech & M. Tech in Electrical Engineering; GPA 9.72/10.0 — **Institute Gold Medal**
Thesis: On Relay-Assisted Cellular Networks
Advisor: Abhay Karandikar

INTERNSHIPS

Google Inc., Mountain View CA — Summer 2014
Optimizing Data Placement Across Cells in Blobstore — Mentor: Arif Merchant

Google Inc., Mountain View CA — Summer 2013
Canary Validation Using Signal Processing — Mentor: Brett Schein

Bell Labs Alcatel-Lucent, Murray Hill NJ — Summer 2012
Erasure Coding for Fast Content Download — Mentor: Emina Soljanin

Qualcomm Corporate R&D, San Diego CA — Summer 2009
Performance Analysis of Active Hand-off in Femtocells — Mentor: Mehmet Yavuz

SELECTED AWARDS AND HONORS

Awards/Honors

Invited to the Rising Stars in EECS workshop for women pursuing academic careers	2015
Graduate Women of Excellence Award, MIT	2013

William Martin Memorial Award for **Best Masters Thesis** in Computer Science, MIT	2012
Morris Joseph Levin Award for **Outstanding Oral Thesis Presentation**, MIT	2012
Institute Gold Medal for highest GPA in the undergraduate class, IIT Bombay	2010
Institute Silver Medal for highest GPA in the masters class, IIT Bombay	2010
Best student in Communications & Signal processing Award, IIT Bombay	2009
Selected among top 50 students in India for the International Chemistry Olympiad camp	2005

Scholarships

Claude E. Shannon Research Assistantship, MIT (full tuition+stipend)	2015–2016
Schlumberger **Faculty for the Future Fellowship** ($50000 funding per year)	2011–2015
Irwin and Joan Jacobs Presidential Fellowship, MIT (full tuition+stipend)	2010–2011
HP fellowship, MIT (summer funding)	2011
Boeing scholarship for academic excellence, IIT Bombay	2010
World Quant scholarship for academic excellence, IIT Bombay	2009

TEACHING AND MENTORSHIP

Course Instructor

– Foundations of Cloud and ML Infrastructure, Carnegie Mellon	Fall 2017

Teaching Assistant (formulating and grading assignments and exams, teaching recitations)

– Introduction to Inference (undergraduate), MIT	Fall 2012
– Wireless & Mobile Communication, IIT Bombay	Spring 2010
– Digital Message Transmission, IIT Bombay	Fall 2009

Homework grader

– Algorithms for Inference, MIT	Fall 2013, 2014
– Inference and Information, MIT	Spring 2013, 2015
– Introduction to Inference	Spring 2014
– Signals and Systems	Spring 2012

EECS REFS, Conflict Management and Mentorship in EECS, MIT	Jan 2014 - Jun 2016
Complete a 40-hour training course in conflict management and mediation, MIT	Jan 2014
Completed a semester-long Graduate Teaching Certificate Program offered by MIT	Spring 2013
Project Mentor for two summer interns at InfoNet Lab, IIT Bombay	2010
Institute Student Mentor for freshmen, IIT Bombay	2008–2010

PUBLICATIONS

Journal

[J3] G. Joshi, Y. Liu, E. Soljanin, "On the Delay-Storage Trade-off in Coded Distributed Storage Systems", *IEEE Journal on Selected Areas of Communications*, volume 32, number 5, May 2014, arXiv:1305.3945

[J2] G. Joshi, E. Soljanin, G. Wornell, "Efficient Redundancy Techniques to Reduce Latency in Cloud Systems", *ACM Transactions on Modeling and Performance Evaluation of Computing Systems*, volume 2, issue 2, May 2017, arXiv:1508.03599

[J1] D. Wang, G. Joshi, G. Wornell, "Efficient Straggler Replication in Parallel Computing ", under review, arXiv:1503.03128

Conference

[C17] S. Dutta, G. Joshi, S. Ghosh, P. Dube, P. Nagpurkar, "Slow and Stale Gradients Can Win the Race: Error-Runtime Trade-offs in Distributed SGD", *accepted to AISTATS*, Apr 2018.

[C16] G. Joshi, "Synergy via Redundancy: Boosting Service Capacity via Adaptive Task Replication", *ACM/IFIP Performance*, Nov 2017.

[C15] M. Aktas, S. E. Anderson, A. Johnston, G. Joshi, S. Kadhe, G. L. Matthews, C. Mayer, and E. Soljanin, "On the Service Capacity Region of Accessing Erasure Coded Content", *Allerton Conference on Communication, Control and Computing*, Oct 2017.

[C14] G. Joshi, "Boosting Service Capacity via Adaptive Task Replication", *ACM Sigmetrics MAMA workshop*, June 2017.

[C13] G. Joshi, E. Soljanin, G. Wornell, "Efficient Task Replication to Reduce Latency in Cloud Systems", *Allerton Conference on Communication, Control and Computing*, Sep 2015.

[C12] G. Joshi, E. Soljanin, G. Wornell, "Queues with Redundancy: Latency-Cost Analysis", *SIGMETRICS Workshop on Mathematical Modeling and Analysis*, Jun 2015.

[C11] D. Wang, G. Joshi, G. Wornell, "Using Straggler Replication to Reduce Latency in Large-scale Parallel Computing", *SIGMETRICS Workshop on Distributed Cloud Computing*, Jun 2015.

[C10] K. Mahadaviani, A. Khisti, G. Joshi, G. Wornell, "Playback Delay in Streaming Communication with Feedback *International Symposium on Information Theory (ISIT)*, Jun 2015.

[C9] G. Joshi, Y. Kochman, G. Wornell, "Throughput-Smoothness Trade-offs in Multicasting of an Ordered Packet Stream", *International Symposium on Network Coding (NetCod)*, Jun 2014.

[C8] D. Wang, G. Joshi, G. Wornell, "Efficient Job Replication for Fast Response Times in Parallel Computation", *ACM SIGMETRICS*, Jun 2014.

[C7] G. Joshi, Y. Kochman, G. Wornell, "The Effect of Block-wise Feedback on the Throughput-Delay Trade-off in Streaming", *INFOCOM Workshop on Communication and Networking Techniques for Contemporary Video*, Apr 2014.

[C6] G. Joshi, E. Soljanin, "Round-robin Overlapping Generations Coding for Fast Content Download", *International Symposium on Information Theory (ISIT)*, Jul 2013.

[C5] G. Joshi, Y. Liu, E. Soljanin, "Coding for Fast Content Download", *Invited Paper, Allerton Conference on Communication, Control and Computing*, Oct 2012.

[C4] G. Joshi, Y. Kochman, G. Wornell, "On Playback Delay in Streaming Communication", *International Symposium on Information Theory (ISIT)*, Jul 2012.

[C3] G. Joshi, A. Karandikar, "Optimal Relay Placement for Cellular Coverage Extension", *National Conference on Communications, India*, Jan 2011.

[C2] G. Joshi, H. Maral, A. Karandikar, "Downlink Erlang Capacity of cellular OFDMA", *National Conference on Communications, India*, Jan 2011.

[C1] G. Joshi, M. Yavuz, C. Patel, "Performance Analysis of Handoff in CDMA2000 Femtocells", *National Conference on Communications, India*, Jan 2010.

Invited Talks

Upcoming Invited Talks

Information Theory and Application Workshop, UCSD	Feb 2018
Three-lecture series on Coding Theory at Clemson University	Mar 2018
Georgia Institute of Technology	Mar 2018
Google Inc., Pittsburgh PA	May 2018

Efficient Redundancy Techniques to Reduce Latency in Cloud Systems

Rutgers University, New Brunswick NJ	Mar 2017
Indian Institute of Technology Bombay, Mumbai	Dec 2016
Tata Institute of Fundamental Research, Mumbai	Dec 2016
Texas A&M University TX	Oct 2016
Carnegie Mellon University, Pittsburgh PA	Mar 2016
University of Southern California, Los Angeles, CA	Mar 2016
IBM T. J. Watson Research Center, Yorktown Heights NY	Feb 2016
Princeton University, EE Departmental Seminar, NJ	Feb 2016
Graduation Day, Information Theory and Applications Workshop UCSD	Feb 2016
IBM Research Student Workshop on Cloud and Data Services, NY	Dec 2015
Rising Stars in EECS, academic workshop for women, MIT	Nov 2015

Using Coding to Reduce Delay in Content Access

Joint Mathematics Meeting, Atlanta	Jan 2017
Mobile Networked Systems Group, MIT	Sept 2014
Google Headquarters, Mountain View, CA	Aug 2014
University of California Berkeley CA	Aug 2014
DIMACS Workshop on Green Data Storage, Rutgers NJ	Dec 2013

Throughput-Smoothness Trade-offs in Streaming Communication

BIRS Workshop on Mathematical Coding Theory for Streaming	Oct 2015
University of Toronto, Canada	May 2014
Indian Institute of Technology (IIT) Bombay	Aug 2012

Professional Activities

Technical Program Committee

International Symposium on Information Theory (ISIT)	2018

Invited Workshop Participation

ICERM Women in Data Science and Math, Brown Univ.	July 2017
Information Theory and Applications Workshop, UCSD	Feb 2016
IBM Research Student Workshop on Cloud and Data Services, NY	Dec 2015
Rising Stars in EECS, academic workshop for women, MIT	Nov 2015

BIRS Workshop on Coding Techniques for Multimedia Streaming, Banff, Canada	Oct 2015
DIMACS Workshop on Green Data Storage, Rutgers NJ	Dec 2013

Journal Reviewer

IEEE Transactions on Communications, IEEE Transactions on Information Theory, IEEE Journal of Selected Areas of Communications, IEEE Transactions on Wireless Communications, IEEE Communication Letters, IEEE Wireless Communication Letters, IEEE/ACM Transactions on Networking, Journal of Operations Research, Performance Evaluation, IEEE Transactions on Services Computing, ACM Transactions on Modeling and Performance Evaluation of Computer Systems

Conference Reviewer

International Symposium on Information Theory (ISIT), Information Theory Workshop (ITW), International Conference on Communications (ICC), Conference on Learning Theory (COLT)