

KAVITA RAMANAN

Kavita.Ramanan@brown.edu

<http://www.dam.brown.edu/people/ramanan/index.htm>

Research Interests Probability theory, stochastic processes and their applications: stochastic analysis; large deviations; concentration of measure; Gibbs measures and phase transitions; stochastic control and stochastic networks

Education

Jun 1992 B.TECH. CHEMICAL ENGINEERING, IIT Bombay, India
May 1993 M.SC. APPLIED MATHEMATICS, Brown University, Providence, RI
May 1998 PH.D. APPLIED MATHEMATICS, Brown University, Providence, RI

Employment

01/2010–present PROFESSOR, Applied Mathematics, Brown Univ, Providence, RI
07/2009–12/2009 PROFESSOR, Math Sciences, Carnegie Mellon Univ, Pittsburgh, PA
09/2003–06/2009 ASSOC. PROFESSOR, Math Sciences, Carnegie Mellon Univ, Pittsburgh, PA
10/1997–12/2002 MEMBER OF TECHNICAL STAFF, Math Center, Bell Labs, NJ
02/1997–11/1997 POSTDOCTORAL FELLOW, Technion, Haifa, Israel

Awards and Honors

- IMS Medallion (2015) http://imstat.org/awards/lectures_winners.htm
- Fellow of the Institute of Mathematical Statistics [IMS] (2013)
- INFORMS Erlang Prize for “Outstanding Contributions to Applied Probability” (2006)
- Select Plenary/Keynote lectures: *Hanna Neumann Plenary Lecture*, Canberra (2016), *Heilbronn Annual Conference*, Bristol (2016), *YEQT*, Amsterdam (2015), *INFORMS Annual Meeting*, Philadelphia (2015), *JFRP*, Berlin (2015), *Sigma Xi* NE Regional Conf., WCSU (2015), *Frontier Prob. Days*, Arizona (2014), *Stoch. Proc. & their Applications*, Colorado (2013), *Appl. Prob. Day*, NY (2010), *Seminar on Stoch. Proc.*, Toronto (2007), *Skorokhod space*, Kiev (2007)
- Invited Tutorials: INFORMS International Meeting, Hawaii (2016), Midwest Probability Colloquium, Evanston (2015), IIT Mumbai (2013), INFORMS Annual Meeting, Pittsburgh (2006)
- Stella Dafermos Award (1996)
- Simon Ostrach Fellowship (1995-1996)
- President’s Award for Excellence in Teaching (Honorable Mention) (1995)

Publications, Invited Lectures, Editorships and Grants Summary

- Over 3800 Citations; H-index = 25; (Google Scholar)
<http://scholar.google.com/citations?user=T0fMPnsAAAAJ&hl=en>
- 53 Publications in refereed book chapters (2), conferences (9) and journals (42)
- 4 U.S. Patents granted
- Over 75 invited conference talks and 35 invited university seminars/colloquia worldwide
- Area Editor of 1 Journal; Associate Editor of 4 Journals (2 current; 2 former); Guest Editor, 1 volume
- Grants in the last 5 years – sole PI: 5 NSF research grants; 1 NSF conference travel grants; co-PI: 3 research grants (1 ARO, 1 AFOSR, 1 NSF)

Mentoring Summary

- Mentor: 8 Post-doc fellows, 7 PhD students, 2 Masters students; 12 Undergraduate students

Select Visiting Positions

Invited Member	Mathematical Sciences Research Institute, CA (Aug, 2015)
Visiting Researcher	Microsoft Research, New England (Sep-Nov 2014)
Guest Researcher	Mathematisches Forschungsinstitut, Oberwolfach, Germany (Jun 2011)
Consultant	Microsoft Theory Group; Cambridge, US (Aug 2011), Redmond, Seattle (Nov-Dec 2006 and Mar-Apr 2003)
Visiting Fellow	Newton Institute for Math Sciences, Cambridge, UK (Mar-May 2010)
Visiting Professor	Courant Institute, NYU (Jan-Jun 2007)
Consultant	Microsoft Theory Group, Redmond, (Nov-Dec 2006)
Visiting Professor	University of Washington, Seattle (Sep-Nov 2006)
Consultant	INRIA, Rocquencourt, France (Dec 2013, Jun 2004 and Aug 2002)
Visiting Scientist	Technion, Haifa, Israel (Jun 2003 and Jul 2001)
Visiting Scientist	University of Cergy-Pointoise, France (May 2003)
Visiting Professor	University of Auckland, New Zealand (Feb-Mar 2003)
Visiting Scientist	Ecole Normale Supérieure, Paris (Jul 1999)

Editorships

AREA EDITOR

- Mathematics of Operations Research [Stochastic Models] (Nov, 2016-)

EDITORIAL BOARD

- Annals of Probability (2006-2012)
- Annals of Applied Probability (2009-present)
- Mathematics of Operations Research (2007-2016)
- Queueing Systems – QUESTA (2008-present)
- Guest Editor, special QUESTA volume on “Stochastic Networks” (2011)
- Stochastic Analysis and Applications (2002-2010)

Grants

- “Scaling Limits of Stochastic Networks,” PI, NSF (9/1/2015–8/31/2018)
- “Problems at the Interface of Stochastics and Analysis,” PI, NSF (9/1/2014–8/31/2017)
- “Stability, Sensitivity & Optimization of Stochastic Systems,” PI, NSF (9/1/2012–8/31/2015)
- “RTG: Integrating Dynamics & Stochastics (IDyaS),” co-PI, NSF (7/1/2012–5/31/2017)
- “Stability & Numerics for Weakly Interacting Particle Systems,” co-PI, AFOSR (7/15/2012–7/14/2016)
- “Rare Events, Control & Metastability of Weakly Interacting Particle Syst.,” co-PI, ARO (5/31/12-5/30/16)
- “Travel Grant for the Applied Probability Society Conference,” PI, NSF (2/1/2011–1/31/2013)
- “Analysis of Large-Scale Stochastic Systems,” PI, NSF (9/1/2009–8/31/2013)
- “Asymptotic Analysis & Control of Stochastic Networks,” PI, NSF (9/1/2007-8/31/2011)
- “Mathematics of Stochastic Networks,” PI, NSF (09/1/2004-08/31/2008)
- US-Israeli Binational Science Foundation (10/2007–10/2011)
- “The Asymptotic Analysis of Time Varying Queueing Systems,” PI, NSF (09/2004-09/2006)
- NZIMA (New Zealand Institute of Math and its Applications), Research grant, Mar 2003

Professional Service

SERVICE TO THE SCIENTIFIC COMMUNITY

- Member of Prize Committees
 - 2019 ICIAM Maxwell Prize Subcommittee
 - APS Erlang Prize Committee (2014–2017)
 - INFORMS Nicholson Prize Committee (2013; Co-chair, 2014)
- Member of Other Committees
 - IMS Council (2015-2018)
 - AMS Nominating Committee (2015-2017)
 - AWM Student Chapters Committee (2015-2018, Chair 2016-2017)
 - Scientific Council of SMAI [French Society for Applied Math] (2014–)
 - IMS Committee on Special Lectures (2014-2017)
 - IMS Nominations Committee (2011-2013)
 - Bernoulli Society Nominations Committee (2013-2016)
 - Bernoulli Society ad-hoc committee for conferences
- Member of Panels
 - ERC (European Research Commission) Consolidator Grant Panel (2013)
 - Evaluation Panel of INRIA, France (2012)
 - Expert Evaluator, KTH, Stockholm (2014, 2016)
 - Multiple NSF and ARO Panels, USA (2006–present)
- Major Conferences Organized/co-organized
 - WINRS (Women’s Networking Research Symposium):*, New England pan-AWM Student chapter conference, Brown University (upcoming, Mar 4, 2017)
 - Conference on *New Developments in Probability*, Northwestern University (May, 2016)
 - IMI Meeting on *Limit Theorems in Probability*, Bangalore, India (Jan 2013)
 - Semester program on *Computational Challenges in Prob.*, ICERM, Providence (Fall 2012)
 - INFORMS Applied Probability Conference, Stockholm, Sweden (Jul 2011)
 - Young Researchers’ Meet, Providence, RI (May 2011)
 - Stochastic Networks* meeting, Newton Institute, Cambridge, UK (Mar 2010)
 - International conference on *Stochastics and Dynamics*, Brown Univ, Providence (Apr 2011)
 - CNA (Center for Nonlinear Analysis) Summer schools, Pittsburgh, PA (Jun 2008 and Jun 2006)
- Steering and Scientific Committee Member for Conferences
 - Organizing Committee Member, SIAM Annual Meeting, Portland, Oregon, (upcoming, June, 2018)
 - 39th Conf. on Stochastic Processes and their Applications, Moscow, 2017
 - Seminar on Stochastic Processes (2013-present)
 - Stochastic Processes and their Applications (2010-2015; Chair, 2016-2018)
 - Stochastic Networks (2008-present)
 - AMS Eastern Section Program Committee (2012-2014)
 - 8th World Congress on Probability and Statistics (2010-2012)
- Conference Program Committee member
 - over 25 conferences in applied math, probability, operations research and computer science
- Book Reviewer for AMS, Cambridge University Press, JASA, Springer-Verlag
- Society Memberships
 - AAAS, AMS, APS (Applied Probability Society), AWM, Bernoulli, SIAM, INFORMS

UNIVERSITY AND DEPARTMENT SERVICE

- Director of Graduate Studies, Brown University (2011-2014)
- Provost Search Committee, Brown University (2014, 2015)
- College Curriculum Committee, Brown University (2016)
- First Readings Seminar Leader, Brown University (2016)
- Diversity and Inclusion Action Plan Committee, Brown University (2016)
- Prager Search Committee, Brown University (2015-Chair; 2016)
- Departmental Review Committee, Brown University (2013)
- Sheridan Center, Department Liaison, Brown University (2012, 2013)
- Graduate Admissions Committee, Brown University (2010-2011)
- Scientific Computing position Search Committee, Brown University (2011)
- Departmental Review Committee, Carnegie Mellon University (2008)
- Undergraduate Curriculum Committee, Carnegie Mellon University (2003-2005)

Outreach Activities

Founder	The Math CoOp (2014–present) high school outreach group
Founder	Faculty Sponsor of AWM Chapter , Applied Math, Brown Univ (2013–present)
Consultant	Narrator and Script consultant, Documentary film on <i>“Srinivas Ramanujan: The Mathematician and his Legacy”</i>
Speaker	GIIMS (Gender Inclusivity in the Mathematical Sciences) Harvard University (Nov 10, 2016)
Panelist	WIMS (Women in Maths and Science), Harvard University (April 2, 2016)
Presenter	MIT Women-in-Math (Dec 1, 2014)
Lecture	<i>The Art of Randomness</i> , STEM to STEAM Workshop, Rhode Island School of Design (RISD), Providence (2014)
Lecture	<i>Tales of Randomness</i> , Center for Women in Mathematics, Smith Coll. (2011)
Panelist	<i>Life as a Mathematician</i> , Math Dept. Undergrad. Group, Brown Univ (2010)
Talk	<i>Symmetry in Art and Nature</i> , MLK Elementary School, Providence, RI (2010)
Founder	“Women in Math” Group, CMU (2008)
Talk	<i>Reflections on Symmetry</i> , Girls’ Science Club, Jewish Community Day School, Pittsburgh, PA (2005)
Mentor	COMPASS Program, CMU (2008–2010)
Mentor	Bell Laboratories Science Grant Program (2001)
Mentor	Lucent Global Science Scholars Program (2000-2002)
Member	Lucent Tech. Graduate Research Program for Women Committee (2000-2002)

Teaching

- GRADUATE COURSES
 - Stochastic Calculus I (Fall 2004-2009), Stochastic Calculus II (Spring 2008, 2009)
 - Markov processes and Stochastic Analysis (Fall, 2016)
 - Stochastic Processes on Graphs (Spring, 2016)
 - Graduate Seminar on Coupling (Spring 2006)
 - Graduate Probability (Fall 2010, Spring 2011, Spring 2016)
 - Stochastic Differential Equations (Spring 2012)

- Topics in Stochastic Processes: Graphical Models (Fall 2012)
- Stochastics and Dynamics (Spring 2014)
- Mathematics of Stochastic Networks (Spring 2017)
- UNDERGRADUATE COURSES
 - Calculus in 3D (Spring 2004, 2006)
 - (Honors) Probability (Fall 2004, 2005, 2007, 2009)
 - Senior Seminar, Mathematics of Random Networks (Fall 2011)

Advising and Mentoring

- POST-DOCTORAL FELLOWS (7) and their subsequent employment
 - G. Shaikhet (2007-2009) Assistant Professor, Carleton Univ, Canada
 - W. Kang (2005-2009) Assistant Professor, Univ of Maryland, Baltimore County
 - A. Ganguly (2012-2013) Assistant Professor, Louisiana State Univ., Baton Rouge
 - A. Smith (2012-2013), Assistant Professor, Univ of Ontario, Canada
 - V. Laschos (2013-2015) Weierstrass Institute, Berlin, Germany
 - D. Lipshutz (2013-present)
 - D. Lacker (2015-present)
- MASTERS STUDENTS (1) and their next jobs
 - N. Shankar (2008), Vice President, Highbridge Capital management
- GRADUATE STUDENTS (8) and their next jobs
 - M. Cudina (2003-2006) Clinical Assistant Professor, Dept. of Math, UT Austin
 - A. Kontorovich (2004-2007) Assistant Professor, Ben Gurion Univ, Israel
 - S. Kar (2006-2010) Assistant Research Professor, ECE Dept. CMU
 - W. Wu (2011-2014) Post-doctoral Fellow, Courant Institute, NYU-Shanghai
 - M. Aghajani (2010-2016) [recipient of Dunmu Ji Thesis award] Post-doctoral Fellow, UCSD
 - S. Kim (2013-2017 expected) [recipient of NDSEG Fellowship]
 - P. Agarwal (2016-present)
 - A. Ganguly (2017-present)
- VISITING GRADUATE STUDENTS (2)
 - F. Rembart, visiting student from TU Munich (Spring 2013), PhD student, Oxford Univ, UK
 - Erika Berenice Roldan Roa, Visiting student from CIMAT, Mexico, Fall 2016
- UNDERGRADUATE STUDENT HONORS THESIS SUPERVISION (3) and their next jobs
 - D. Gitelman (2012-2013) [recipient of Rohn Truell Prize at Brown], PhD student, Princeton Univ
 - H. Tross (Spring '13) Consultant, Communication Media Advisors, Boston
 - K. Kardassakis (2013-2014) [recipient of Jerome Stein Award at Brown]
- STUDENT RESEARCH PROJECTS AND INDEPENDENT STUDY COURSES (9)
 - Anand Bedekar, Bell Labs summer intern (Jun-Aug 1998)
 - Edmund Yeh, Bell Labs summer intern (Jun-Aug 1998), Assistant Professor, Yale University
 - Kamal Ibrahim, CMU freshman student (Summer 2008)
 - Ines Azaiez, ETH-CMU exchange student, senior (Spring 2008)
 - Alice Ren, Junior, Brown Univ (Fall 2011)
 - Chongwu Du, Senior, Brown Univ (Fall 2012)
 - Wonniesim, Junior, Brown Univ (Fall 2013)
 - Wonho Rhee, Junior, Brown Univ (UTRA Summer 2015)
 - E. Hu (2015; UTRA Spring 2016)
- FRESHMAN AND SOPHOMORE ADVISOR (2011–present) Over 25 students

List of Patents

- A. Bedekar, S. Borst, K. Ramanan, P. Whiting and E. Yeh. “Down-link transmission inter-cell scheduling in CDMA data networks” (U.S. Patent 6/603/753).
- A. Bedekar, S. Borst, K. Ramanan, P. Whiting and E. Yeh. “Down-link transmission scheduling in CDMA data networks” (U.S. Patent 6/763/009).
- K. Ramanan and A. Stolyar. “Method and apparatus for scheduling traffic to meet quality of service requirements in a communication network” (U.S. Patent 7/054/267).
- S. Borst, K. Kumaran, K. Ramanan, P. Whiting. “Methods and apparatus for planning wireless data networks using analytical modeling of user level performance” (U.S. Patent 8/099/098).

List of Publications

A. Preprints

1. D. Lipshutz and K. Ramanan, “Pathwise differentiability of reflected diffusions in convex polyhedral domains,” *Preprint* (2017).
2. D. Lacker and K. Ramanan, “Rare Nash equilibria and the price of anarchy in large static games,” *Preprint* (2017).
3. R. Atar, A. Biswas, H. Kaspi and K. Ramanan, “A Skorokhod-type Map on Measure-valued Paths and Priority Queues,” *Preprint* (2016),
4. M. Aghajani and K. Ramanan, “The limit of stationary distributions of many-server queues in the Halfin-Whitt regime”, *Preprint* (2016).
5. P. Dupuis, K. Ramanan and W. Wu, “Large deviation principle for finite-state mean field interacting particle systems,” *Preprint* (2015).
6. M. Aghajani, X. Li and K. Ramanan, “Mean-field dynamics of load-balancing networks with general service distributions,” *Preprint* (2015).
7. M. Aghajani and K. Ramanan, “Ergodicity of an SPDE associated with a many-server queue,” *Preprint* (2015).
8. P. Dupuis, V. Laschos and K. Ramanan, “Large deviations for empirical measures generated by Gibbs measures with singular energy functionals,” *Preprint* (2015).
9. S.S. Kim and K. Ramanan, “A Sanov-type theorem for the surface and cone measures on the ℓ^p -sphere,” *Preprint* (2015).

B. Book Chapters

1. N. Gantert, S.S. Kim and K. Ramanan, “Cramér’s theorem is atypical”, Springer’s AWM Series: Advances in the Mathematical Sciences, AWM Research Symposium, Editors: Letzter, G., Lauter, K., Chambers, E., Flournoy, N., Grigsby, J.E., Martin, C., Ryan, K., Trivisa, K (2016) <http://arxiv.org/abs/1508.04402>.
2. L. Kruk, J. Lehoczky, K. Ramanan and S. Shreve. “Double Skorokhod map and renegeing real-time queues,” *Markov Processes and Related Topics: A Festschrift for Thomas G. Kurtz*, IMS Collections, Vol. 4 (2008) 169–193.

C. Journal Publications

1. D. Lipshutz and K. Ramanan, “On directional derivatives of Skorokhod maps in convex polyhedral domains,” to appear in *Annals of Applied Probability*, (2016).
2. K. Ramanan and M. Shkolnikov, “Intertwinings of beta-Dyson Brownian motions of different dimensions,” (2016), to appear in *Annales de l’Institut Henri Poincaré*.
3. A. Smith and K. Ramanan, “Bounds on Lifting Continuous-State Markov Chains to Speed Up Mixing,” (2016), to appear in *Journal of Theoretical Probability*.
4. N. Gantert, S.S. Kim and K. Ramanan, “Large deviations for random projections of ℓ^p balls,” (2015), to appear in *Annals of Probability*.
5. K. Burdzy, Z.-Q. Chen, D. Marshall and K. Ramanan, “Obliquely reflected Brownian motions in non-smooth planar domains,” (2015), to appear in *Annals of Probability*.
6. W. Kang and K. Ramanan, “On the submartingale problem for reflected diffusions in domains with piecewise smooth boundaries,” *Annals of Probability*, Vol. 45, (2017), No. 1, 404–468.
7. A. Budhiraja, P. Dupuis, M. Fischer and K. Ramanan. “Local stability of Kolmogorov forward equations for finite state nonlinear Markov processes,” *Electronic Journal of Probability* Vol. 20 (2015) Article 81.
8. A. Budhiraja, P. Dupuis, M. Fischer and K. Ramanan. “Limits of relative entropies associated with weakly interacting particle systems,” *Electronic Journal of Probability* Vol. 20 (2015) Article 80.
9. F. Rembart, N. Gantert and K. Ramanan, “Large deviations for weighted sums of exponential random variables,” **19**, *ECP*, no. 41 (2014), 1–14.
10. W. Kang and K. Ramanan, “Characterizations of stationary distributions of reflected diffusions,” *Annals of Applied Probability*, **23**, No. 4 (2014), 1329–1374.
11. H. Kaspi and K. Ramanan, “SPDE limits of many-server queues”, *Annals of Applied Probability*, **23**, No. 1 (2013) 145–229.
12. S. Kar, J. Moura and K. Ramanan, “Distributed parameter estimation in sensor networks: nonlinear observation models and imperfect communication,” *IEEE Transactions on Information Theory* **58**, No. 6 (2012) 3575–3605.
13. W. Kang and K. Ramanan, “Asymptotic approximations for the stationary distributions of many-server queues,” *Annals of Applied Probability*, **22**, No. 2 (2012) 477–521.
14. D. Galvin, F. Martinelli, K. Ramanan, P. Tetali, “The finite-state hard core model on a regular tree”, *SIAM Jour. Discrete Math*, **25**, No. 2 (2011) 894–915.
15. M. Cudina and K. Ramanan, “Asymptotically optimal control for time-inhomogeneous networks,” *SIAM Jour. Contr. Opt.*, **49**, No. 2 (2011) 611–645.
16. L. Kruk, J. Lehoczy, K. Ramanan and S. Shreve, “Heavy traffic analysis for EDF queues with reneging,” *Annals of Applied Probability*, **21**, No. 2 (2011) 484–545.
17. H. Kaspi and K. Ramanan. “Law of large numbers limits for many-server queues,” *Annals of Applied Probability* **21** (2011), 33–114.
18. W.N. Kang and K. Ramanan, “Fluid limits for many-server queues with reneging,” *Annals of Applied Probability*, **20** (2010) 2204–2260.
19. A. Mandelbaum and K. Ramanan. “Directional derivatives of oblique reflection maps,” *Mathematics of Operations Research*, **35** (2010) 527–558.

20. W.N. Kang and K. Ramanan, “A Dirichlet process characterization of a class of reflected diffusions,” *Annals of Probability*, **38** (2010) 1062–1105.
21. K. Burdzy, W.N. Kang and K. Ramanan, “The Skorokhod map in a time-dependent interval,” *Stochastic Processes and their Applications*, **119** (2009) 428–452.
22. L. Kontorovich and K. Ramanan. “Concentration inequalities for dependent random variables via the martingale method,” *Annals of Probability*, **36** (2008) 6:2126–2158.
23. R. Atar, A. Budhiraja and K. Ramanan. “Deterministic and stochastic differential inclusions with multiple surfaces of discontinuity,” *Probability Theory and Related Fields*, **142** (2008) 249–283.
24. K. Ramanan and M. Reiman. “The heavy traffic limit of an unbalanced generalized processor sharing model,” *Annals of Applied Probability*, **18** (2008) 1:22–58.
25. L. Kruk, J. Lehoczyk, K. Ramanan and S. Shreve. “An explicit formula for the Skorokhod map on $[0, a]$,” *Annals of Probability*, **35** (2007) 5:1740–1768.
26. K. Ramanan. “Reflected diffusions defined via the extended Skorokhod map.” *Electronic Journal of Probability*, **11** (2006), 934–992.
27. B. Luen, K. Ramanan and I. Ziedins. “Nonmonotonicity of phase transitions in a loss network with controls.” *Annals of Applied Probability*, **16** (2006), 3:1528–1562.
28. M. Andrews, K. Kumaran, K. Ramanan, A. Stolyar, P. Whiting and R. Vijayakumar. “Scheduling in a queueing system with asynchronously varying service rates.” *Probab. Engrg. Inform. Sci.*, **18** (2004) 2:191–217.
29. P. Winzer, H. Kogelnik and K. Ramanan. “Precise outage specifications for 1st-order PMD.” *IEEE Phot. Tech. Lett.*, **16** (2004) 2:449–451.
30. K. Ramanan and M. Reiman. “Fluid and heavy traffic limits for a generalized processor sharing model.” *Annals of Applied Probability*, **13** (2003) 1, 100–139.
31. P. Winzer, H. Kogelnik, C.-H. Kim, H. Kim, R. M. Jopson, L.E. Nelson and K. Ramanan. “Receiver impact on first-order PMD outage.” *IEEE Phot. Tech. Lett.* **15** (2003), 10:1482–1484.
32. P. Dupuis and K. Ramanan. “A time-reversed representation for the tail probabilities of stationary reflected Brownian motion.” *Stochastic Processes and their Applications*, **98** (2002) 2, 253–287.
33. K. Ramanan, A. Sengupta, I. Ziedins and P. Mitra. “Markov random field models of multicasting in tree networks.” *Advances in Applied Probability*, **34** (2002) 1, 1–27.
34. M. Andrews, K. Kumaran, K. Ramanan, A. Stolyar and P. Whiting. “Providing quality of service over a shared wireless link.” *IEEE Communications*, **39**, (2001) 2, 150–154.
35. K. Ramanan and A. Stolyar. “Largest weighted delay first scheduling: large deviations and optimality.” *Annals of Applied Probability*, **11** (2001) 1, 1–49.
36. P. Dupuis and K. Ramanan. “Explicit formulas for the solution of certain optimal control problems on domains with corners.” (Invited Paper), *Theor. Probab. Math. Stat.*, **63** (2000), 32–48.
37. P. Dupuis and K. Ramanan. “A multiclass feedback queueing network with a regular Skorokhod problem.” *Queueing Systems*, **36** (2000) 327–349.

38. K. Ramanan and O. Zeitouni. “The quasi-stationary distribution for small random perturbations of certain one-dimensional maps.” *Stochastic Processes and their Applications*, **84** (1999), 25-51.
39. P. Dupuis and K. Ramanan. “Convex duality and the Skorokhod problem – Part I.” *Probability Theory and Related Fields*, **115** (1999) 2, 153-195.
40. P. Dupuis and K. Ramanan. “Convex duality and the Skorokhod problem – Part II.” *Probability Theory and Related Fields*, **115** (1999) 2, 197-236.
41. P. Dupuis and K. Ramanan. “Large deviation properties of data sources that share a buffer.” *Annals of Applied Probability*, **8** (1998), 1070-1129.
42. P. Dupuis and K. Ramanan. “A Skorokhod formulation and large deviation analysis of the generalized processor sharing model.” *Queueing Systems*, **28** (1998), 109-124.

D. Refereed and Invited Conference Publications

1. S. Kar, J. Moura and K. Ramanan. “Sample path large deviations for the randomly sampled continuous-discrete Kalman filter,” *Proceedings of the CDC conference*, Atlanta (2010).
2. S. Kar, J. Moura and K. Ramanan. “Large deviations for many server networks with long-range dependent and batch arrivals,” *Proc. of 46th Annual Conf. on CCC, Allerton* (2008).
3. K. Ramanan. “From loss networks to interacting particle systems,” Invited paper in *Proc. of 55th Session of the ISI*, Sydney, Australia (2005).
4. B. Luen, K. Ramanan and I. Ziedins. “Multicasting and phase transitions in tree loss networks.” Invited paper in *Proc. of 41st Annual Conf. on CCC, Allerton* (2003), 1616–1625.
5. J. Cao and K. Ramanan. “A Poisson limit for buffer overflow probabilities.” In *Proc. of IEEE INFOCOM’02*, **21** (2002), 1:994–1003.
6. C. Chekuri, K. Ramanan, P. Whiting and L. Zhang. “Blocking probability estimates in a partitioned sector TDMA system.” In *Proc. of 4th International Conf. on Discrete Algorithms and Methods for Mobile Computing and Communications*, Boston, MA (2000), 28–34.
7. A. Bedekar, S. Borst, K. Ramanan, P. Whiting and E. Yeh. “Downlink scheduling in CDMA data networks.” In *Proc. of IEEE GLOBECOM* (1999), 1784–1791.
8. K. Ramanan and A. Weiss. ”Sharing Bandwidth in ATM.” Invited paper in *Proc. of 34th Annual Conf. on CCC, Allerton*, (1996).
9. K. Ramanan. “Targeting heat exchanger networks,” in *Heat Exchanger Network Synthesis – A Pinch Technology Approach* (1995), U. V. Shenoy, Gulf Publishing Co., Houston.

E. Technical Reports

1. K. Ramanan. “On the rate function of multi-dimensional reflected Brownian motions.” Bell Labs Technical Memorandum ITD-02-43817C (2002).
2. K. Majewski and K. Ramanan. “Minimizing large deviation paths of Jackson networks.” Bell Labs Technical Memorandum ITD-02-43798G (2002).

3. K. Ramanan, K. Kumaran, S. Borst and P. Whiting. “Optimal capacity regions for wireless and wireline traffic with QoS constraints.” Bell Labs Technical Memorandum, ITD-02-43767Y (2002).
4. K. Ramanan, P. Winzer and H. Kogelnik. “A new method for estimation of outage probabilities due to PMD.” Bell Labs Technical Memorandum ITD-02-43751F (2002).

Invited Talks, Lectures and Colloquia

A. Plenary, Keynote and Tutorial Lectures

A1. Mathematics Conferences.

1. CFM-Imperial Distinguished Lecturer, London, UK, *Upcoming*, May-June 2017.
2. Invited Address, American Mathematical Society Eastern Sectional Meeting, New York, *Upcoming*, May, 2017
3. Hanna Neumann Plenary Lecture, 60th Annual meeting of the Australian Mathematical Society, Canberra, Australia, December, 2016.
4. Plenary lecture, Workshop on “Advances in Ergodic Theory, Hyperbolic Dynamics, and Statistical Laws,” Australian National University, Canberra, December, 2016.
5. Plenary Lecture, Heilbronn Institute for Mathematical Research, Annual Conference, Bristol, UK, September 2016.

A2. Probability Conferences

1. Plenary Lecture, 13th German Probability and Statistics Days, Freiburg, Germany, (*upcoming*) Feb 27–Mar 2, 2018
2. Plenary Lecture, “Ergodicity of Stochastic Networks”, Stochastic Networks meeting, UCSD, July 2016.
3. Keynote talk, “Scaling limits of randomized load balancing networks”, YEQT conference, Eindhoven, October 2015.
4. Keynote talk, “Phase transitions in randomized load balancing”, Junior Female Researchers in Probability (JFRP), Berlin, Germany, October 22-23, 2015.
5. Midwest Probability Colloquium Tutorial Lectures, Northwestern University, October 8-10, 2015.
6. IMS Medallion Lecture, “Infinite-dimensional scaling limits of stochastic networks”, Applied Probability Society (APS) meeting, Istanbul, July, 2015.
7. Plenary lecture, “Obliquely reflected diffusions in non-smooth domains”, 7th International Conference on Stochastic Analysis and its Applications, (Satellite conference of ICM 2014), Seoul, Korea, Aug 2014.
8. Plenary Lecture, “Reflected Brownian motions in Non-smooth Domains”, Frontier Probability Days, Arizona, May 2014.
9. Plenary Lecture, “Perspectives on Obliquely Reflected Brownian Motions”, 36th Conference on “Stochastic Processes and their Applications”, Boulder, Colorado, Jul 2013.
10. Plenary Lecture, “Reflected diffusions, Dirichlet processes and heavy traffic limits,” *Applied Probability Day*, Columbia Univ, New York, NY, Jun 2010.
11. Discussant to the Markov lecture, “Different Kinds of Diffusion Approximations,” *INFORMS Annual Meeting*, Seattle, Nov 2007.

12. Plenary lecture, “Generalizations of the Skorokhod Problem,” “*Skorokhod space: 50 years and Later*” conference in honour of A.V. Skorokhod, Kiev, Ukraine, Jun 2007.
13. Plenary Lecture, “Measure-valued Process Limits of some Stochastic Networks,” “*Seminar on Stochastic Processes*,” Fields Institute, Toronto, Mar 2007.

A3. Interdisciplinary/Applied Math Conferences and Workshops

1. Plenary lecture, IV AMMCS (Applied Mathematics, Modeling and Computational Science) International Conference, Waterloo, Ontario, *upcoming* August, 2017
2. Invited Tutorial, “Analysis of Large-Scale Networks,” INFORMS International Meeting, Kona, Hawaii, June 2016.
3. Keynote lecture, “Stochastic networks: Scaling limits, performance analysis and optimization”, INFORMS Annual Meeting, Philadelphia, November 1-4, 2015.
4. Keynote Lecture, “The Power of Randomness”, Sigma-Xi Northeast Regional Meeting, WCSU, Connecticut, April 2015.
5. Invited tutorial on “Limit theorems for stochastic networks”, School-cum-Workshop on Probability in Engineering Sciences, IIT-Mumbai, Mar 2013.
6. Invited Tutorial on “Large Deviations of Reflected Diffusions,” “*INFORMS Annual Meeting*,” Pittsburgh, Nov 2006.

B1. Selected Invited Conference Talks and Colloquiums

1. Conference on Stochastic Processes and their Applications, Moscow, Russia, *upcoming*, July 24–28, 2017
2. “Women in Probability” Workshop, TUM, Munich, *upcoming*, July 21–22 2017.
3. Finger Lakes Probability Seminar, Syracuse University, *upcoming*, April 21-22, 2017
4. Mathematics Department Colloquium, Case Western Reserve University, *upcoming*, April 14, 2017
5. OIT Seminar, Stanford University, *upcoming*, April 12, 2017
6. Mathematics Department Colloquium, University of Maryland, Mar 1, 2017
7. Distinguished Women in Mathematics Colloquium, Austin, Texas, October, 2016.
8. Invited talk, 85th Birthday conference of Borovkov, Novosibirsk, August, 2016.
9. Invited Talk, Bernoulli World Congress, Toronto, Canada, July 2016
10. Invited Talk, Workshop on “Stochastic Analysis and Mathematical Finance - A Fruitful Partnership”, BIRS Oaxaca, Mexico, May 2016
11. “Hydrodynamic Limits of Randomized Load Balancing Networks”, ICIAM, Beijing, China, August, 2015
12. “Pathwise Differentiability of reflected Brownian motions in (simple) polyhedrons”, Workshop on “Stochastic Processes and Random Fields: Geometry and Fine Properties”, Haifa, Israel, July 2015
13. “On the submartingale problem for reflected diffusions on piecewise smooth domains”, Workshop on “Reflected Brownian motions, stochastic networks and their applications”, IMA, Minneapolis, June 2015
14. “Pathwise differentiability of a semimartingale reflected Brownian motion in a simple convex polyhedron”, Workshop on “Applied Probability Frontiers: Computational and Modeling Challenges”, Banff International Research Station, June 2015

15. "A Free-Boundary Problem arising in order-book dynamics", MFPDE conference, Rutgers, May 2015
16. "The role of correlation decay in filtering compressed signal dynamics", IMA Workshop on "Graphical models, Statistical Inference and Algorithms", May 2015
17. "Large deviations principles for Random Projections of ℓ^p balls, and the atypicality of Cramer's theorem", AWM Symposium, Maryland, April 2015
18. "Stationary distribution of an SPDE associated with a Many-Server Queue", AMS Sectional Meeting, Huntsville, Alabama, March 2015
19. "Hydrodynamic limits of randomized load-balancing networks", Conference on "Stochastic Networks and stochastic geometry", a conference dedicated to Francois Baccelli on his 60th birthday, Institut Henri Poincaré, Paris, January 2015
20. "The infinite-dimensional Skorokhod Map, with applications to systems with continuous priority", INFORMS Annual meeting, San Francisco, Nov 2014
21. "Hydrodynamic limits of load balancing models", IMS Annual Meeting, Sydney, Australia, Jul 2014.
22. "Obliquely reflected diffusions in non-smooth domains", Workshop for Women in Probability, Munich, Jun 2014.
23. "Obliquely reflected diffusions in non-smooth domains", AMS Sectional Meeting, Albuquerque, NM, April 2014.
24. "Stationary distributions of (obliquely) reflected diffusions", INFORMS Annual Meeting, Oct 2013.
25. "Uniqueness of stationary distribution of the diffusion approximation of a many-server queue", APS Conference, Costa Rica, Jul 2013.
26. "Computing volumes of convex bodies", APS Conference, Costa Rica, Jul 2013.
27. "Obliquely reflecting Brownian motions in fractal domains", Workshop on New Directions in Probability Theory, Bangalore, June 2013.
28. "SPDE Limits of many-server queues", IMA Workshop, Jan 2013.
29. "Large deviations of finite-state mean-field interacting systems", 8th World Congress in Probability and Statistics, Istanbul, Jul , '12
30. "Large deviations of finite-state mean-field interacting systems", Stochastic Networks meeting, June '12
31. "Continuous Hard Core Model and Computation of Volumes of Polytopes", SAMSI Workshop, Feb '12
32. "Avatars of the Hard Core Model", IPAM Workshop, Jan '12
33. "Directional Derivatives of the Skorokhod Map", INFORMS Annual Meeting, Nov 2011
34. "Derivatives of the Oblique Reflection Map", Applied Probability Meeting, Special Session on the Skorokhod Problem, Jul 2011
35. "Concentration inequalities for dependent random variables," ICM Satellite conference on Probability and Statistics, Aug 2010
36. "Roughness of local times and heavy traffic limits," IMS Annual Meeting, Gothenburg, Sweden, Aug 2010

37. "Phase transitions for the multi-state hard core model on a tree," IMS Annual Meeting, Gothenburg, Sweden, Aug 2010
38. "Stochastic networks and measure-valued processes," Workshop on "New Topics on the Interface between Probability and the Communication Sciences," Inaugural workshop of the Newton Institute program on "Stochastic Processes in the Communication Sciences," Cambridge, UK, Jan 2010
39. "Measure-valued processes and stochastic networks," Conference on "New Directions in Applied Mathematics," Bangalore, India, Dec 2009.
40. "Reflected Brownian Motions, Queueing Networks and Dirichlet Processes," Michael Harrison's Birthday conference, Stanford, Aug 2009
41. "On Asymptotic Approximations of Many-Server Queues with Reneging," Applied Probability Meeting, Ithaca, Cornell, Jul 2009
42. "Processes with Discontinuous Dynamics: A Unified Framework," Cincinnati Probability Symposium, Mar 2009
43. "Sample path large deviations for many-server queues," INFORMS Annual Meeting, Washington D.C., Oct 2008
44. "Real-time queues with reneging", INFORMS Annual Meeting, Washington D.C., Oct 2008
45. "Properties of reflected diffusions", *Women in Probability* Conference, Cornell University, Ithaca, Oct 2008
46. "Stochastic processes in discontinuous media: theory and applications", CMU-Portugal ICTI Workshop in Applied Mathematics, Sep 2008
47. "Measure-valued Process Limits for Many Server Systems", 7th World Congress in Probability and Statistics, Singapore, Jul 2008
48. "Asymptotic Approximations of Many-Server Queues", Stochastic Networks Conference, Paris, France, Jun 2008
49. "Phase Transitions in Loss Networks," INFORMS Annual Meeting, Seattle, Nov 2007
50. "Stochastic Differential Inclusions and Large Deviations," Applied Probability Conference, Eindhoven, Jul 2007
51. "Fluid Limit Theorems for Many-Server Queues," Applied Probability Conference, Eindhoven, Jul 2007
52. "Mappings of Measure-valued Processes and EDF queues," Workshop on *Stochastic Networks*, Edinburgh, UK, Jul 2007
53. "Measure-valued Processes and Stochastic Networks," IMS Annual meeting, Brazil, Jul 2006
54. "Asymptotically Optimal Control of Time-Inhomogeneous Queueing Networks," INFORMS Annual Meeting, San Francisco, Nov 2005
55. "Large Deviations of Jump Markov Processes with Discontinuous Interior Statistics," 13th Applied Probability Conference, Ottawa, Canada, Jul 2005.
56. "An Explicit Formula for the Two-sided Reflection Map," 13th Applied Probability Conference, Ottawa, Canada, Jul 2005.
57. "Solutions to Differential Inclusions with Applications to Fluid Limits," INFORMS Annual Meeting, Denver, Colorado, Oct 2004

58. "Gibbs Measures and Loss Networks," Workshop on *Spatial Dependence in Stochastic Networks*, ICMS, Edinburgh, U.K. Jun 2004
59. "Strong Approximations of Time-Inhomogeneous Queueing Networks," INFORMS, Annual Meeting, Atlanta, Georgia, Oct 2003
60. "Directional Derivatives and Time-Dependent Networks," Workshop on *Heavy Traffic Analysis and Process Limits of Stochastic Networks*, Eindhoven, The Netherlands, Sep 2003
61. "Tail Probabilities of Reflected Diffusions," LIDS seminar, MIT, Cambridge, Massachusetts, Apr 2003.
62. "Large Deviations and Time Reversal in the Presence of Constraints," Workshop on *Modern Problems in Applied Probability*, Edinburgh, U.K, Aug 2003
63. "Directional Derivatives of the Reflection Map: Approximations of Non-stationary Queueing networks," Conference on *Stochastic Networks*, Stanford University, California, Jun 2003.
64. "Markov Random Field Models of Multicasting in Tree Networks," AMS and MAA Spring Southeastern Sectional Meetings, Special Session on *Probability and Combinatorics*, Atlanta, Georgia, Mar 2002
65. "Large Deviations of Diffusion Approximations of Queueing Networks," 11th Applied Probability Conference, Manhattan, New York, Jul 2001.
66. "Tail Probabilities of Stationary Reflected Brownian Motion," Workshop on *The Skorokhod Problem*, Bedlewo, Poland, Jul 2001.
67. "Large Deviations of Reflected Brownian Motion," AMS Annual Meeting, Special Session on *Stochastic Analysis and its Applications*, New Orleans, Louisiana, Jan 2001.
68. "Tail Probabilities of Reflected Brownian Motion," International Workshop on *Stochastic Optimization and Adaptation*, Cochin, India, Dec 2000.
69. "On a Non-standard Diffusion Approximation," INFORMS Fall 1999 meeting, Special Session on *Queueing models and Communication Systems*, Philadelphia, Pennsylvania, Jul 1999.
70. "Large Deviation Properties of Interacting Data Streams in a Communication Network," 10th Applied Probability Conference, Ulm, Germany, Jul 1999
71. "Convex Duality and the Skorokhod Problem," ICIAM (International Congress on Industrial and Applied Mathematics) Jul 1999, the Minisymposium on *Hysteresis, Sweeping Processes and the Skorokhod Problem*, Edinburgh, U.K.
72. "Reflected Diffusions in Polyhedral Domains and the Generalized Processor Sharing Discipline," AMS-SMM Joint Meetings, Special Session on *Stochastic Analysis* in Denton, Texas, May 1999.
73. "Some New Results on the Skorokhod Problem," Symposium on *Stochastic Control and Non-linear Filtering*, Los Angeles, California, Dec 1997.
74. "Convex Duality and the Skorokhod Problem," AMS-SIAM Summer Seminar in Applied Mathematics on the *Mathematics of Stochastic Manufacturing Systems*, Williamsburg, Virginia, Jun 1996.

C. Colloquia and Seminars at Universities and Research Labs

Brown University (Applied Math); Boston University (Math); Carnegie Mellon University (Math Sciences); Columbia University (Math, ORIE and Stat); Cornell

University (ORIE); Georgia Institute of Technology (ISYE); Lehigh University (Math); MIT (OR); MIT (Math); Princeton (ORFE); Princeton (Probability Seminar); Rutgers University (Math); Stanford University (MSE); University of North Carolina, Chapel Hill (Stat); UCLA (Math); UCSD (Math); UT Austin (Math); UIUC (Math); University of Delaware (Math); University of Washington (Math); City University of New York (Grad School); Yale University (Stat); IBM, T.J. Watson; Microsoft Research, Redmond; University of Melbourne, Melbourne, Australia; Israel Institute of Technology (Technion); Paris VI, France; Ecole Normale Supérieure, France; Israel; University of Cergy-Pontoise, France (Math); INRIA, Rocquencourt, France; Eindhoven University, Netherlands; Chennai Mathematical Institute, Chennai, India; Tata Institute of Fundamental Research, Mumbai and Bangalore, India; Indian Statistical Institute (ISI), Delhi and Kolkata, India; Indian Institute of Science (IISc, Math), Bangalore, India; Indian Institute of Technology, Mumbai, India;