

CURRICULUM VITAE

RAMI ATAR

December 18, 2022

Personal

Born: May 4, 1967, Haifa

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Married to Rinat, father of Noam and Hila

Academic Degrees

- 1989 B.Sc. (summa cum laude), Electrical Engineering, Technion
- 1994 M.Sc., Electrical Engineering, Technion
- 1997 D.Sc., Electrical Engineering, Technion

Employment

Academic appointments

- 2010- Professor, Department of Electrical Engineering, Technion
- 2006 Visiting Associate Professor, Department of Statistics, UNC, Chapel Hill
- 2005-2006 Visiting Associate Professor, Department of Mathematics, University of Washington, Seattle
- 2004-2010 Associate Professor with Tenure, Department of Electrical Engineering, Technion
- 2000-2004 Senior lecturer, Department of Electrical Engineering, Technion
- 1999-2000 Lecturer, Department of Electrical Engineering, Technion
- 1998-1999 Postdoctoral fellow, The Fields Institute for Research in Mathematical Sciences, Toronto; Teaching position, Mathematics Department, York University, Toronto

- 1997-1998 Postdoctoral fellow, Division of Applied Mathematics, Brown University, Providence, RI

Military Service

1989-1994 Engineer and head of an R&D section in the Military Intelligence, IDF

Teaching

Calculus I and II (undergraduate), York University, Toronto

Probability (undergraduate), University of Washington, Seattle

Introduction to digital signal processing (undergraduate), Technion

Random signals (undergraduate), Technion

Signals and systems (undergraduate), Technion

Control systems 2 (undergraduate), Technion

Queueing systems (undergraduate), Technion

Digital processing of discrete time random signals (graduate), Technion

Stochastic processes (graduate), Technion; Syllabus substantially modified

Optimal control (graduate), Technion

Stochastic methods and models (graduate), Technion; Introduced and developed the course

Several advanced topics graduate courses, including: Asymptotic methods in stochastic networks;

Optimal stochastic control; Hamilton-Jacobi-Bellman PDE; Determinantal point processes.

Selected Technion Activities

- 2003–2005, 2010–2012, Organizer of the Technion’s Probability and Stochastic Processes Seminar
- 2007–2009, Vice chair for undergraduate student affairs, Department of Electrical Engineering
- 2014–2016, Vice chair for undergraduate studies, Department of Electrical Engineering
- 2010–2014, Senate permanent committee on undergraduate and graduate studies, member
- 2010–2014, Senate member
- 2018–2020, Senate preparatory committee for nomination and promotion, member
- 2020– Professional committee for nomination and promotion, member of pool of chairs
- 2020–2021, Ad hoc committee for the creation of the Technion’s ethical code, member
- 2020–2022, Senate elections committee, member
- 2022, Senate committee for selection of research professor, member

Selected Professional Activities

Editorial work

- 2008–2014, Associate editor, *Mathematical Methods of Operations Research*
- 2009–2012, Associate editor, *Annals of Applied Probability*
- 2010–2013, Associate editor, *Queueing Systems Theory and Applications*
- 2010–2013, Associate editor, *Mathematics of Operations Research*
- 2012–2017, Associate editor, *Annals of Probability*
- 2016–, Associate editor, *Applied Mathematics and Optimization*
- 2019, Guest editor, Open Problems in Applied Probability, *Stochastic Systems* 9, No. 3, 291–317

Grant committees

- The Israel Science Foundation (ISF), grant committee member (several times)
- The German-Israeli Foundation (GIF), scientific advisor

Evaluation committees, prize committees

- 2016 Inria Evaluation Committee, member
- 2017–2020 IMS committee on special lectures (responsibility: Wald and Rietz lecturers, medallion lecturers)
- 2018–2020 APS prize committee; committee chair in 2019 (responsibility: Markov lecturer, Erlang prize, APS best publication award, APS best student paper prize (one year))

Membership in Professional Societies

- Institute of Mathematical Statistics (IMS), Fellow
- Applied Probability Society (APS), Member
- INFORMS, Member
- AMS, Member
- SIAM, Member

Honors

- President's List, B.Sc. studies (1986, 7, 8, 9); Ariel Finci excellence prize for B.Sc. studies (1988); Wolf foundation scholarship for B.Sc. studies (1989)
- 1994 Eliahu and Joyce Jury award for the masters thesis
- 1996 Ministry of Communications scholarship for the Ph.D. studies
- Rothschild Fellowship for post-doctorate for the academic year 1997/8
- Plenary lecture, *Stochastic Processes and their Applications*, Osaka 2010
- Keynote lecture, *Young European Queueing Theorists*, Eurandom, Eindhoven 2013
- 2014 Elected fellow of the Institute of Mathematical Statistics
- Plenary lecture, *Seminar on Stochastic Processes*, Brown, Providence RI, 2018
- The Lady Davis Chair in Science, 2019–

Graduate Students, Postdocs

Past students

- Chanit Giat, M.Sc. “Ergodic optimal control for queueing models” (2005)
- Nir Solomon, M.Sc. “Optimal scheduling for multi-class costumers in the non-degenerate slowdown regime” (2010) (now at Intel)
- Asaf Zviran, M.Sc., co-advisor (principal advisor: A. Mandelbaum) “Fork-join networks in heavy traffic: diffusion approximation and control” (2011) (now a postdoc fellow working in biotechnology, NYGC)
- Danielle Levy Jarczun, M.Sc. (without thesis) “Optimal policy computation of the multiclass queue” (2015)
- Gal Mendelson, M.Sc. (**summa cum laude**) “Control in the large deviations regime for a class of queueing models” (2015)
- Michal Asory, M.Sc. principal advisor (co-advisor: Adam Shwartz) (now at Rafael)
- Niv Nayman, M.Sc. principal advisor (co-advisor: Yan Dolinski) “Stochastic optimization with applications in finance: shortfall risk minimization” (2016) (now at IDF)
- Gennady Shaikhet, D.Sc. principal advisor (co-advisor: A. Mandelbaum) “Optimal stochastic control of many server queueing systems” (2007) (now an associate professor of mathematics at Carleton)
- Chanit Giat, D.Sc. principal advisor (co-advisor N. Shimkin) “Asymptotic optimality of priority control rules in queueing systems with abandonments” (2011) (now at Rafael)

- Mark Shifrin, D.Sc. principal advisor (co-advisor: I. Cidon) “Admission and scheduling control in cloud computing: Markov decision processes and diffusion approximations” (2015) (now a postdoc, communication systems, Ben Gurion)
- Anat Lev-Ari, D.Sc. “Optimization and control asymptotics in queueing” (2018)
- Gal Mendelson, D.Sc. principal advisor (co-advisor: Isaac Keslassy), **best student paper award of APS**

Current students

- Yonatan Shadmi, D.Sc.

Past postdocs

- Yair Shaki, Postdoctoral fellow (mentored by A. Shwartz and myself) (2010–2011) (now at Lev academic center, Jerusalem)
- Anindya Goswami, Postdoctoral fellow (mentored by A. Shwartz and myself) (2011–2012) (now associate professor of mathematics, IISER, Pune, India)
- Anup Biswas, Postdoctoral fellow (2012–2014) (now associate professor of mathematics, IISER, Pune, India) **Young Scientist Award by the Indian National Science Academy**
- Asaf Cohen, Postdoctoral fellow (2014–2015) (now tenure track assistant professor, U. Michigan)
- Subhamay Saha, Postdoctoral fellow (2015–2016) (now tenure track assistant professor at IIT, Guwahati, India)
- David Lipshutz, Zuckerman postdoctoral fellow (2016–2018) (now at Flatiron Inst., Simons Foundation, NYC)
- Prasenjit Karmakar (2018–2021), Viterbi postdoctoral fellow
- Hugo Panzo, Zuckerman postdoctoral fellow, EE and Math departments (mentored by R. Pinsky and myself) (2019–2021)
- Eyal Castiel (2020–2021)

Long term visitors

- Chen Dubi, Sabbatical leave from Kamag, 2017–2018 (three semesters).

Research Grants

- 2000–2003, US-Israel Binational Science Foundation (BSF), “Performance and control of stochastic networks: Asymptotic methods”, PI: Rami Atar, Adam Shwartz, Paul Dupuis, Alan Weiss.
- 2002–2006, Israel Science Foundation (ISF), “Control of many-server queues in heavy traffic”, PI: Rami Atar, Avishai Mandelbaum.
- 2008–2012, ISF, “Diffusion limits, large deviations and control”, PI: Rami Atar.
- 2009–2013, BSF, “Blind control of stochastic networks and heavy traffic”, PI: Rami Atar, Amarjit Budhiraja, Adam Shwartz.
- 2012–2016, ISF, “Topics in stochastic network asymptotics”, PI: Rami Atar.
- 2016–2020, ISF, “Priority and scaling limits”, PI: Rami Atar.
- 2020–2024, ISF, “Skorohod problems in measure space”, PI: Rami Atar.

Talks

Plenary, keynote, tutorial

1. “On the nondegenerate slowdown diffusion regime for queueing networks in heavy traffic”, 34th Conference on Stochastic Processes and their Applications (SPA 2010). Osaka, September, 2010. Plenary lecture.
2. “Moderate deviation approach to heavy traffic”, Workshop on scheduling and priorities in queueing systems, YEQT VII, Eurandom, Eindhoven, November 2013. Keynote speaker.
3. “Moderate deviations and heavy traffic”, ORSIS 2015, Haifa. Semi-plenary tutorial.
4. “Robustness at the large deviations scale via Rényi divergence”, Seminar on Stochastic Processes, Brown U., 2018, Plenary lecture.

Invited talks

1. “Brownian control problems for queueing systems in the Halfin-Whitt regime”. The mathematics of stochastic networks, Eurandom, Eindhoven, The Netherlands, October 29 – November 2, 2001
2. “On Neumann eigenfunctions of some planar domains”. Statistical Society of Canada, Annual Meeting. Hamilton, May 26–29, 2002.
3. “Optimally controlled queueing networks in large deviations regime”. Workshop on modern problems in applied probability. Edinburgh, August 21–29, 2002.
4. “Treelike parallel servers stations in heavy traffic”. INFORMS Atlanta 2003, October 19–22.

5. “Lyapunov exponent for controlled diffusions and queues in heavy traffic”. Conference on stochastic processes and interacting particle systems, Indian Statistical Institute, Delhi 2003, December 12–14.
6. “Queueing systems with many servers: control theory and heavy traffic asymptotics” The workshop on stochastic networks, call center workshop, CRM, Montreal, July 2004.
7. “On constrained singular control of diffusions and related PDE”, Seventh Northwest Probability Seminar, Seattle, Oct. 2005
8. “Critically loaded queueing systems that behave as underloaded”, INFORMS, Applied Probab., Pittsburgh 2006
9. “Diffusion limit for dynamic routing with random service rates”, ORSIS, Maale Hahamisha 2007
10. “Diffusion limit for dynamic routing with random service rates”, INFORMS, Applied Probab., Eindhoven 2007
11. “HJB equations, no arbitrage, and generalized Brownian networks”, INFORMS, Applied Probab., Eindhoven 2007
12. “Interpolating between the Halfin-Whitt and conventional diffusion regimes”, Mathematical Theory of Networks and Systems, Virginia Tech, 2008
13. “A diffusion regime with nondegenerate slowdown”, INFORMS, Washington, 2008
14. “Control under model uncertainty in the Halfin-Whitt regime”, INFORMS, Washington, 2008
15. “A diffusion regime with nondegenerate slowdown”, Valuetools, Athens, 2008
16. “Identifying near optimal trajectories for a game associated with the infinity-Laplacian”, Joint Probability Workshop of the Technion and the Budapest University of Technology, January, 2009, Technion, Haifa
17. “The nondegenerate slowdown diffusion regime: limit results and control formulations”, International Workshop on Queueing and Stochastic Systems On the Occasion of Conferment of an Honorary Doctorate to Prof. Onno J. Boxma, Haifa, June, 2009
18. “The $c\mu/\theta$ Rule”, WITOR-09, Joint Workshop of the Turkish and Israeli Operations Research Societies, Istanbul, September, 2009
19. “The nondegenerate slowdown diffusion regime: limit results and control formulations”, The 15th INFORMS Applied Probability Society Conference, Cornell University, July, 2009
20. “The $c\mu/\theta$ rule”, INFORMS Annual Meeting, San Diego, October 2009
21. “Control formulations under the nondegenerate slowdown diffusion regime”, NET-COOP 2009. November, 2009, EURANDOM, The Netherlands
22. “On the non-degenerate slowdown diffusion regime”, ORSIS, Nir-Etsyon, June 2010

23. “Asymptotically optimal dynamic pricing for network revenue management”, International Workshop on Applied Probability (IWAP), Madrid, July 2010.
24. “On the non-degenerate slowdown diffusion regime”, Annual IMS meeting. Gothenburg, August 2010.
25. “On many-server limits of the parallel server model”, ORSIS, Acco, June 2011
26. “Optimal control at equilibrium for the parallel server model via measure valued fluid limits”, APS Conference, Stockholm, July 2011
27. “A differential game for a resource allocation problem”, Variational and Optimal Control Problems on Unbounded Domains, Workshop dedicated to the memory of A. Leizarowitz, Technion, January 2012
28. “The $c\mu$ rule in ordinary, moderate and large deviation regimes”, Workshop in honor of G. Weiss, Haifa University, June 2012
29. “Control of queueing systems in the moderate and large deviation regime”, Stochastic Networks Conference, MIT, June 2012
30. “Three new state space collapse results for the multiclass G/G/1 queue”, Appl. Probab. Soc. workshop, San Jose, Costa Rica 2013
31. “An in finite-dimensional Skorohod map and continuous parameter priority”, joint Technion-HKUST workshop, Industrial Engineering & Management, Technion, May 2014
32. “On an infinite dimensional Skorohod map and continuous parameter priority”, IMS Annual meeting, Sydney, July 2014
33. “The Skorohod map and priority”, Stochastic Processes and Random Fields: Geometry and Fine properties, A workshop in honor of Robert Adler’s and Haya Kaspi’s 35th year at the Technion (2015)
34. “The Skorohod map and priority”, Euro Operations Research Society, Vienna (2015)
35. “Sensitive heavy traffic limits”, INFORMS, Philadelphia 2015
36. “Priority, fluid limits and the measure-valued Skorohod map”, Stochastic Networks Conference, San Diego (2016)
37. “Priority, fluid limits and the measure-valued Skorohod map”, World Congress in Probability and Statistics, Toronto (2016)
38. “Robust performance bounds at the large deviations scale via information divergences”, 2017 SIAM Conference on Control and Its Applications, Pittsburgh, PA
39. “A diffusion limit for a queueing model in the form of a Walsh Brownian motion”, 2017 BIRS workshop, Stochastic Analysis and its Applications, Banff
40. “Serve the shortest queue and Walsh Brownian motion”, Queueing Colloquium, CWI, Amsterdam 2018

41. “Real-time queues and measure-valued Skorohod maps”, AIMS conference on Dynamical Systems, Differential Equations and Applications, Taipei 2018
42. “Uncertainty quantification at the large deviations scale, Rényi divergence and queueing models”, APS Brisbane 2019
43. “Uncertainty quantification at the large deviations scale”, INFORMS, Seattle 2019
44. “Diffusion limits for policies that prioritize by job size”, INFORMS Annual meeting, (virtual) 2020
45. “Boundary free free boundary problems”, Stochastic Control and Quantitative Finance, HUJI 2022
46. “Boundary free free boundary problems and particle systems with selection”, Random media and large deviations: a celebration in honor of Ofer Zeitouni, NYU 2022
47. TBA, 40 years of reflected Brownian motion and related topics. Roscoff, France, 2023
48. TBA, Applied Probability Society Conference, Nancy, France, 2023

Contributed talks (selected)

1. “Rate function identification for some families of queueing processes”. Workshop on analysis and simulation of communication networks, The Fields institute for research in mathematical sciences, Toronto, November 9–13, 1998
2. “On the lowest nonzero Neumann eigenvalue in some planar domains”. Conference on stochastic processes and their applications, Center for mathematical sciences, Cambridge, UK, July 9–13, 2001
3. “On Levy processes reflecting in a cone”. Workshop on the Skorokhod problem, Banach Center’s Conference Site, Bedlewo, Poland, July 16–21, 2001
4. “Treelike parallel server stations in Halfin-Whitt heavy traffic”, Workshop on Heavy Traffic Analysis and Process Limits of Stochastic Networks, EURANDOM, Eindhoven, September 8–11, 2003

Colloquia and Seminars (selected)

Brown, Div. Applied Math, Probability seminar
 CMU, Math Department, Probability seminar
 Fields Institute, Probability seminar
 Hebrew University, Stats Department, Probability seminar
 NCSU, Math Department, Probability seminar
 Tel Aviv University, Engineering Department seminar
 UBC, Math Department, Probability seminar
 UCSD, Math Department, Probability Seminar
 Umass at Amherst, Math department, Probability seminar

UNC, Stats Department colloquium
University of Minnesota, Math Department, Probability seminar
University of Washington, Math Department, Probability seminar

Conference Activities

Invited Organized Sessions

1. “Fluid and diffusion limits for queueing systems”, ORSIS, Maale Hahamisha 2007
2. “Control and partial differential equations”, INFORMS, Applied Probability Conference, EU-RANDOM, Eindhoven 2007
3. “Recent asymptotic methods in queueing”, Valuetools, Athens 2008
4. “Diffusion scale and control”. The 15th INFORMS Applied Probability Society Conference, Cornell University, Ithaca, New York, to be held July, 2009
5. “Network asymptotics and control”. INFORMS Annual Meeting, Applied Probability Cluster, Austin, TX, November 7–10, 2010
6. “Dynamic control of queueing systems”, APS Conference, July, 2011, Stockholm
7. “Control and asymptotics for queueing systems” and “Control of heavily loaded queueing systems”, APS Conference, July, 2011, Stockholm
8. “Stochastic control” IWAP, Jerusalem, June 2012
9. “Mean field limits”, INFORMS Applied Probability Society Conference, Northwestern U., 2017
10. “Control and asymptotics of stochastic networks”, INFORMS, Phoenix, 2018
11. Open problem session, INFORMS, Phoenix, 2018
12. “Network asymptotics”, APS, Brisbane, 2019
13. Open problem session, APS, Brisbane, 2019
14. “Stochastic network asymptotics”, INFORMS, Seattle, 2019
15. Markov lecture session chair (Markov lecture delivered by Laurant Massoulié), INFORMS, Seattle, 2019
16. “Diffusion limits and related topics”, INFORMS, virtual meeting, 2020

Program Committee Member

1. INFORMS Applied Probability Conference, Eindhoven 2007
2. INFORMS Applied Probability Conference, Stockholm, July, 2011
3. IWAP, Jerusalem, June 2012
4. INFORMS Applied Probability Conference, Costa Rica, July, 2013
5. Service Engineering, a conference in honor of Avi Mandelbaum, IE&M, Technion, 2018, organizer
6. APS, Brisbane, 2019

Refereed Papers in Conference Proceedings (selected)

1. R. Atar and P. Dupuis, "Optimally stabilizing controls for a deterministic network model", Allerton conference, Urbana 1999
2. R. Atar and P. Dupuis, "Characterization of the value function for a differential game formulation of a queueing network optimization problem", Conference on Decision and Control, Phoenix 1999
3. R. Atar and P. Dupuis, "Robust formulation of a network control problem", Conference on Decision and Control, Phoenix 1999
4. R. Atar, C. Giat and N. Shimkin, "The $c\mu/\theta$ rule", Proceedings of Valuetools, Athens 2008
5. R. Atar and T. Weissman, "Mutual information, relative entropy and estimation in the Poisson channel", ISIT, St.-Petersburg 2011
6. R. Atar, A. Mandelbaum and A. Zviran, "Control of fork-join networks in heavy traffic", Allerton conference, Urbana 2012
7. R. Atar and Chen Dubi, "Modeling zero power reactor noise and neutron count distribution: a stochastic differential equations approach", Math. Comp. Meth. Nucl. Sc., 2017