Curriculum Vitae

Rami Atar

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Publications

Theses

- *Lyapunov exponents in nonlinear filtering* (M.Sc., Technion. 1994). Advisor: Prof. Ofer Zeitouni
- *Exponential stability in nonlinear filtering* (D.Sc., Technion, 1997). Advisor: Prof. Ofer Zeitouni

Journal Papers (published)

1. R. Atar and O. Zeitouni. Lyapunov exponents for finite state nonlinear filtering. *Siam J. Contr. Opt.* 35, No. 1, 36–55 (1997)
2. R. Atar and O. Zeitouni. Exponential stability for nonlinear filtering. *Annales de l'Institut H. Poincare, Probabilities et Statistiques* 33 No. 6, 697–725 (1997)
3. R. Atar. Exponential stability for non-linear filtering of diffusion processes in a noncompact domain. *Annals of Probability,* 26 No. 4, 1552–1574 (1998)
4. R. Atar and O. Zeitouni. A note on the memory length of the optimal nonlinear filter. *Systems and Control Letters* 35, No. 2, 131–135 (1998)
5. R. Atar, F. Viens and O. Zeitouni. Robustness of Zakai's equation via Feynman-Kac representations. *Stochastic analysis, Control, Optimization and Applications: A Volume in Honor of W. H. Fleming,* edited by W. M. McEneaney, G. Yin and Q. Zhang, 339–352; Birkhauser, (1999)
6. R. Atar and P. Dupuis. Large deviations and queueing networks: Methods for rate function identification. *Stochastic Processes and their Applications* 84, 255–296 (1999)
7. R. Atar. Invariant wedges for a two point reflecting Brownian motion and the 'hot spots' problem. *Electronic Journal of Probability,* Vol. 6, paper 18, p. 1–19 (2001)
8. R. Atar, A. Budhiraja and P. Dupuis. On positive recurrence of constrained diffusion processes. *Annals of Probability,* Vol. 29, No. 2, 979–1000 (2001)

9. R. Atar, S. Athreya and M. Kang. Ballistic deposition on a planar strip. *Electronic Communications in Probability,* Vol. 6, paper 3, p. 31–38 (2001)

10. R. Atar and P. Dupuis. A differential game with constrained dynamics and viscosity solutions of a related HJB equation. *Nonlinear Analysis,* Vol. 51, No. 7, p. 1105–1130 (2002)

11. R. Atar and K. Burdzy. On nodal lines of Neumann eigenfunctions. *Electronic Communications in Probability,* Vol. 7, paper 14, 129–139 (2002)

12. R. Atar and A. Budhiraja. Stability properties of constrained jump-diffusion processes. *Electronic Journal of Probability,* Vol. 7, paper 22, 1–31 (2002)

13. R. Atar, P. Dupuis and A. Shwartz. An escape time criterion for queueing networks: Asymptotic risk-sensitive control via differential games. *Mathematics of Operations Research,* Vol. 28, No. 4, 801–835 (2003)

14. R. Atar, A. Mandelbaum and M. Reiman. A Brownian control problem for a simple queueing system in the Halfin-Whitt regime. *Systems and Control Letters,* Vol. 51/3-4 269–275 (2004)

15. R. Atar and K. Burdzy. On Neumann eigenfunctions in lip domains. *Journal of the American Mathematical Society* 17, 243–265 (2004)

16. R. Atar, P. Dupuis and A. Shwartz. Explicit solution for a network control problem in the large deviation regime. *Queueing Systems* 46 (1-2): 159–176 (2004)

17. R. Atar, A. Mandelbaum and M. Reiman. Scheduling a multi-class queue with many exponential servers: Asymptotic optimality in heavy-traffic. *Annals of Applied Probability* 14 no. 3, 1084–1134 (2004)

18. R. Atar. A diffusion model of scheduling control in queueing systems with many servers. *Annals of Applied Probability* 15 no. 1B, 820–852 (2005)

19. R. Atar. Scheduling control for queueing systems with many servers: Asymptotic optimality in heavy traffic. *Annals of Applied Probability* 15 no. 4, 2606–2650 (2005)

20. R.Atar and A. Budhiraja. Singular control with state constraints on unbounded domain. *Annals of Probability* 34 no. 5, 1864–1909 (2006)

21. R. Atar, A. Mandelbaum and G. Shaikhet. Queueing systems with many servers: null controllability in heavy traffic. *Annals of Applied Probability* 16, no. 4, 1764–1804 (2006)

22. R. Atar, A. Budhiraja and R. J. Williams. HJB equations for certain singularly controlled diffusions. *Annals of Applied Probability* 17, no. 5-6, 1745–1776 (2007)

23. R. Atar and K. Burdzy. Mirror couplings and Neumann eigenfunctions. *Indiana University Math. Journal* 57, no. 3, 1317–1351 (2008)

24. R. Atar, A. Budhiraja and K. Ramanan. Deterministic and stochastic differential inclusions with multiple surfaces of discontinuity. *Probability Theory and Related Fields* 142, no. 1-2 (2008) 249–283

25. R. Atar. Central limit theorem for a many-server queue with random service rates. *Annals of Applied Probability* 18, no. 4, 1548–1568 (2008)

26. R. Atar and A. Shwartz. Efficient routing in heavy traffic under partial sampling of service times. *Mathematics of Operations Research*, 33: 899–909 (2008)

27. R. Atar and G. Shaikhet. Critically loaded queueing models that are throughput sub-optimal. *Annals ofApplied Probability*, 19, no. 2, 521–555 (2009)

28. R. Atar, S. Athreya and Z. Chen. Exit time, Green function and semilinear elliptic squations. *Electronic Journal of Probability*, Vol. 14, Paper no. 3, 50–71 (2009)

29. R. Atar, A. Mandelbaum and G. Shaikhet. Simplified control problems for multi-class many-server queueing systems. *Mathematics of Operations Research*, Vol. 34, no. 4, 795–812 (2009)

30. R. Atar and A. Budhiraja. A stochastic differential game for the inhomogeneous ∞-Laplace equation. *Annals of Probability*, Vol. 38, no. 2, 498–531 (2010)

31. R. Atar, C. Giat and N. Shimkin. The $c\mu/\theta$ rule for many-server queues with abandonment. *Operations Research*, Vol. 58, No. 5, 1427–1439 (2010)

32. R. Atar and A. Budhiraja. On near optimal trajectories for a game associated with the infinity-Laplacian. *Probability Theory and Related Fields*, Vol. 151, no. 3-4, 509-528 (2011)

33. R. Atar, Y. Y. Shaki and A. Shwartz. A blind policy for equalizing cumulative idleness. *Queueing Systems* 67: 275–293 (2011)

34. R. Atar, C. Giat and N. Shimkin. On the asymptotic optimality of the $c\mu/\theta$ rule under ergodic cost. *Queueing Systems* 67: 127–144 (2011)

35. R. Atar and N. Solomon. Asymptotically optimal interruptible service policies for scheduling jobs in a diffusion regime with non-degenerate slowdown. *Queueing Systems* Vol. 69, No. 3, 217–235 (2011)

36. R. Atar. A diffusion regime with non-degenerate slowdown. *Operations Research*, Vol. 60, no. 2, 490–500 (2012)

37. R. Atar and T. Weissman. Mutual information, relative entropy, and estimation in the Poisson channel. *IEEE Transactions on Information Theory*, Vol. 58 No. 3 (2012)

38. R. Atar and M. Reiman. Asymptotically optimal dynamic pricing for network revenue management. *Stochastic Systems*, 2, 232–276 (2012)

39. R. Atar, A. Goswami and A. Shwartz. Risk-sensitive control for the parallel server model. *SIAM Journal on Control and Optimization*, 51(6), 4363–4386 (2013)

40. R. Atar and I. Gurvich. Scheduling parallel servers in the non-degenerate slowdown diffusion regime: Asymptotic optimality results. *Annals of Applied Probability*, Vol. 24, No. 2, 760–810 (2014)

41. R. Atar, H. Kaspi and N. Shimkin. Fluid limits for many-server systems with reneging under a priority policy. *Mathematics of Operations Research*, Vol. 39, No. 3, pp. 672–696 (2014)

42. R. Atar, I. Cidon and M. Shifrin. MDP based optimal pricing for a cloud computing queueing model. *Performance Evaluation*, 78, 1–6 (2014)

43. R. Atar and A. Biswas. Control of the multiclass G/G/1 queue in the moderate deviation regime. *Annals of Applied Probability*, Vol. 24 No. 5, 2033–2069 (2014)

44. R. Atar, A. Goswami and A. Shwartz. On the risk-sensitive cost for a Markovian multiclass queue with priority. *Electronic Communications in Probability* 19 No. 11, 1–13 (2014)

45. R. Atar and M. Shifrin. An asymptotic optimality result for the multiclass queue with finite buffers in heavy traffic. *Stochastic Systems*, Vol. 4, No. 2, 556–603 (2014)

46. R. Atar, K. Chowdhary and P. Dupuis. Robust bounds on risk-sensitive functionals via Renyi divergence. *SIAM J. on Uncertainty Quantification*, Vol. 3, pp. 18–33 (2015)

47. R. Atar and A. Budhiraja. On the multi-dimensional skew Brownian motion. *Stochastic Processes and their Applications*, Vol. 125, pp. 1911–1925 (2015)

48. R. Atar, A. Biswas and H. Kaspi. Fluid limits of G/G/1+G queues under the non-preemptive earliest-deadline-first discipline. *Mathematics of Operations Research*, Vol. 40, No. 3, pp. 683–702 (2015)

49. R. Atar and N. Merhav. Information-theoretic applications of the logarithmic probability comparison bound. *IEEE Transactions on Information Theory*, Vol. 61, No. 10 (2015)

50. R. Atar and S. Saha. A note on non-existence of diffusion limits for serve-the-longest-queue when the buffers are equal in size. *Electronic Communications in Probability*, 21, no. 2, 1–10 (2016)

51. R. Atar and A. Cohen. A differential game for a multiclass queueing model in the moderate-deviation heavy-traffic regime. *Mathematics of Operations Research*, 41, no. 4, 1354–1380 (2016)

52. R. Atar and G. Mendelson. On the non-Markovian multiclass queue under risk-sensitive cost. *Queueing Systems*, 84:265–278 (2016)

53. R. Atar and S. Saha. An ε-Nash equilibrium with high probability for strategic customers in heavy traffic. *Mathematics of Operations Research*, 42(3):626–647 (2017)

54. R. Atar and S. Saha. Optimality of the generalized $c\mu$ rule in the moderate deviation regime. *Queueing Systems*, 87:113–130 (2017)

55. R. Atar and A. Cohen. Asymptotically optimal control for a multiclass queueing model in the moderate deviation heavy traffic regime. *Annals of Applied Probability*, Vol. 27, No. 5, 2862–2906 (2017)

56. C. Dubi and R. Atar. Modeling neutron count distribution in a subcritical core by stochastic differential equations. *Annals of Nuclear Energy*, 111, 608–615 (2018)

57. R. Atar, A. Biswas, H. Kaspi and K. Ramanan. A Skorohod map on measure-valued paths with applications to priority queues. *Annals of Applied Probability*, Vol. 28, no. 1, 418–481 (2018)

58. R. Atar, A. Biswas and H. Kaspi. Law of large numbers for the many-server earliest-deadline-first queue. *Stochastic Processes and their Applications*, 128:2270–2296 (2018)

59. R. Atar and A. Lev-Ari, Workload-dependent dynamic priority for the multiclass queue with reneging. *Mathematics of Operations Research*, 43, No. 2, 494–515 (2018)

60. R. Atar and A. Lev-Ari, Optimizing buffer size for the retrial queue: two state space collapse results in heavy traffic. *Queueing Systems*, 90:225–255 (2018)

61. C. Dubi and R. Atar, A stochastic differential equation for neutron count with detector dead time and applications to the Feynman-alpha formula. *Annals of Nuclear Energy*, 128, 380–389 (2019)

62. C. Dubi and R. Atar, High rate diffusion-scale approximation for counters with extendable dead time. *Nuclear Engineering Technology* 51-6, 1616–1625 (2019).

63. M. Armony, R. Atar and H. Honnappa, Asymptotically optimal appointment schedules. *Mathematics of Operations Research*, 44, No. 4, 1345–1380 (2019)

64. R. Atar and A. Cohen, Serve the shortest queue and Walsh Brownian motion. *Annals of Applied Probability*, 29, No. 1, 613–651 (2019)

65. R. Atar, I. Keslassy and G. Mendelson, Replicate to the shortest queues. *Queueing Systems*, 92, Issue 1–2, 1–23 (2019)

66. R. Atar, I. Keslassy and G. Mendelson, Sub-diffusive load-balancing in time-varying queueing systems. *Operations Research*, Vol. 67, No. 6, 1678–1698 (2019) (APS best student paper)

67. R. Atar, I. Keslassy, G. Mendelson, A. Orda and S. Vargaftik, Persistent-idle load-distribution. *Stochastic Systems*, 10(2):152–169 (2020)

68. R. Atar and D. Lipshutz, Heavy traffic limits for join the shortest estimated queue policy using delayed information. *Mathematics of Operations Research*, 46(1):268–300 (2021)

69. R. Atar, A. Budhiraja, P. Dupuis and R. Wu, Robust bounds and optimization at the large deviations scale for queueing models via Renyi divergence. *Annals of Applied Probability*, 31(3): 1061–1099 (2021)

70. C. Dubi and R. Atar, Modeling reactor noise due to rod and thermal vibrations with thermal feedback using stochastic differential equations. *Nucl. Sci. Eng.,* 195(3), 256–270 (2021)

71. R. Atar, A. Budhiraja, P. Dupuis and R. Wu, Large deviations for the single server queue and the reneging paradox. *Math. Oper. Res.*, 47(1), 232-258 (2022)

72. R. Atar, P. Karamkar and D. Lipshutz, Customer-server population dynamics in heavy traffic. *Stoch. Syst.*, 12(1), 68-91 (2022)

Accepted

73. R. Atar and Y. Shadmi, Fluid limits for earliest-deadline-first networks. *Stoch. Proc. Appl.*, to appear.

Submitted

74. R. Atar, W. Kang, H. Kaspi and K. Ramanan, Long-time limit of nonlinearly coupled measure-valued equations that model many-server queues with reneging. Submitted.

75. R. Atar, The heat equation with order-respecting absorption and particle systems with topological interaction. Submitted.

76. R. Atar, E. Castiel and M. Reiman, Parallel server systems under an extended heavy traffic condition: A lower bound. Submitted.

77. R. Atar, E. Castiel and M. Reiman, Asymptotic optimality of switched control policies in a simple parallel server system under an extended heavy traffic condition. Submitted.

78. R. Atar, E. Castiel and Y. Shadmi, Scheduling in the high uncertainty heavy traffic regime. Submitted.

Book Chapters

1. R. Atar, "Exponential decay rate of the filter's dependence on the initial distribution", *The Oxford Handbook of Nonlinear Filtering*, Oxford University Press, Oxford, 2011