Atilla Yılmaz

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Research interests

Probability theory, stochastic processes and partial differential equations. In particular: limit theorems, large deviations; random walks, diffusions and polymers in random environments; periodic and stochastic homogenization, first- and second-order Hamilton-Jacobi equations, viscosity solutions; related topics in statistical mechanics, optimal control and population dynamics.

Academic degrees

2013. *Doçent* of Mathematics, Turkish Inter-University Council.

2008. Ph.D. in Mathematics, Courant Institute, New York University. *Advisor:* S. R. S. Varadhan.

2005. M.S. in Mathematics, Courant Institute, New York University.

2003. B.S. in Mathematics, high honors, Boğaziçi University, Istanbul.

2003. B.S. in Electrical & Electronics Engineering, high honors, Boğaziçi University, Istanbul.

Academic employment

2018 –   Associate Professor, Department of Mathematics, Temple University.

2017 – 2018. Visiting Associate Professor, Department of Mathematics, Courant Institute, NYU.

2015 – 2018. Associate Professor, Department of Mathematics, Koç University.

2014 – 2015. Associate Professor (tenured), Department of Mathematics, Boğaziçi University.

2011 – 2014. Assistant Professor, Department of Mathematics, Boğaziçi University.

2009 – 2011. Morrey Assistant Professor, Department of Mathematics, University of California, Berkeley.

2008 – 2009. Postdoctoral Fellow, Department of Mathematics, Weizmann Institute.

2003 – 2008. Research and Teaching Assistant, Department of Mathematics, Courant Institute, NYU.

Awards, fellowships and grants

2023. Teaching Award for Tenure-Track Faculty, Department of Mathematics, Temple University.

2022 – 2027. Collaboration Grant for Mathematicians, Simons Foundation.

2017 – 2019. Young Scientist Award (BAGEP), Science Academy (*Bilim Akademisi*) of Turkey.

2014. Hayri Körezlioğlu Research Award, Mathematics Foundation of Turkey.

2012 – 2016. Marie Curie Career Integration Grant, European Union FP7.

2012. Science Meeting Grant, European Science Foundation RGLIS Programme.

2008 – 2009. Feinberg Postdoctoral Fellowship, Weizmann Institute.

2008. Wilhelm Magnus Memorial Prize, Courant Institute, NYU.

2003 – 2008. MacCracken Fellowship, Graduate School of Arts and Science, NYU.

2003. Dora Aksoy Award, Department of Mathematics, Boğaziçi University.

2003. Rectorate Award, Boğaziçi University.

Publications and preprints

(E. Kosygina, A. Yılmaz) Homogenization of nonconvex viscous Hamilton-Jacobi equations in stationary ergodic media in one dimension. Submitted. arXiv:2403.15963.

(E. Kosygina, A. Yılmaz) Loss of quasiconvexity in the periodic homogenization of viscous Hamilton-Jacobi equations. Submitted. arXiv:2309.09343.

(A. Davini, E. Kosygina, A. Yılmaz) Stochastic homogenization of nonconvex viscous Hamilton-Jacobi equations in one space dimension. *Comm. PDE* (accepted). arXiv:2303.06415.

(A. Yılmaz) Stochastic homogenization of a class of quasiconvex viscous Hamilton-Jacobi equations in one space dimension. *J. Differential Equations*, **300**, 660–691, 2021.

(A. Yılmaz) Stochastic homogenization and effective Hamiltonians of Hamilton-Jacobi equations in one space dimension: the double-well case. *Calc. Var. Partial Differ. Equ.*, **60**, article no. 105, 2021.

(E. Kosygina, A. Yılmaz, O. Zeitouni) Homogenization of a class of one-dimensional nonconvex viscous Hamilton-Jacobi equations with random potential. *Comm. PDE*, **45**, 32–56, 2020.

(A. Yılmaz, O. Zeitouni) Nonconvex homogenization for one-dimensional controlled random walks in random potential. *Ann. Appl. Probab.*, **29**, 36–88, 2019.

(F. Rassoul-Agha, T. Seppäläinen, A. Yılmaz) Averaged vs. quenched large deviations and entropy for random walk in a dynamic random environment. *Electron. J. Probab.*, **22**, paper no. 57, 1–47, 2017.

(O. Gün, A. Yılmaz) Fluid limit for the Poisson encounter-mating model. *Adv. in Appl. Probab.*, **49**, 1201–1229, 2017.

(F. Rassoul-Agha, T. Seppäläinen, A. Yılmaz) Variational formulas and disorder regimes of random walks in random potentials. *Bernoulli*, **23**, 405–431, 2017.

(O. Gün, A. Yılmaz) The stochastic encounter-mating model. *Acta Appl. Math.*, **148**, 71–102, 2017.

(N. Georgiou, F. Rassoul-Agha, T. Seppäläinen, A. Yılmaz) Ratios of partition functions for the log-gamma polymer. *Ann. Probab.*, **43**, 2282–2331, 2015.

(F. Rassoul-Agha, T. Seppäläinen, A. Yılmaz) Quenched free energy and large deviations for random walks in random potentials. *Comm. Pure Appl. Math.*, **66**, 202–244, 2013.

(A. Yılmaz) Harmonic functions, h-transform and large deviations for random walks in random environments in dimensions four and higher. *Ann. Probab.*, **39**, 471–506, 2011.

(A. Yılmaz) Equality of averaged and quenched large deviations for random walks in random environments in dimensions four and higher. *Probab. Theory Related Fields*, **149**, 463–491, 2011.

(A. Yılmaz, O. Zeitouni) Differing averaged and quenched large deviations for random walks in random environments in dimensions two and three. *Comm. Math. Phys.*, **300**, 243–271, 2010.

(A. Yılmaz) Averaged large deviations for random walk in a random environment. *Ann. Inst. H. Poincaré Probab. Statist.*, **46**, 853–868, 2010.

(A. Yılmaz) Quenched large deviations for random walk in a random environment. *Comm. Pure Appl. Math.*, **62**, 1033–1075, 2009.

(A. Yılmaz) Large deviations for random walk in a space-time product environment. *Ann. Probab.*, **37**, 189–205, 2009.

(A. Yılmaz) Large deviations for random walk in a random environment. *Ph.D. Thesis*, Courant Institute of Mathematical Sciences, New York University, 82 pp., ISBN: 978-0549-82338-4, 2008.

Invited talks at seminars, colloquia, workshops and conferences

(2024/08) Conference: "Advances in Probability and Interacting Particle Systems", Harvard University.

(2024/04) Probability, Ergodic Theory & Mathematical Physics Seminar, University of Rochester.

(2024/03) Analysis Seminar, Temple University.

(2024/03) Probability Seminar, University of Wisconsin–Madison.

(2023/10) Minisymposium: "Advances in Analysis of PDEs", SIAM-NNP Annual Meeting, NJIT.

(2023/06) Turkish Mathematical Society Young Mathematicians Meeting, Nesin Mathematics Village, TR.

(2023/05) Workshop: "Random Growth Models and KPZ Universality", BIRS, CA.

(2023/05) LCDS (Lefschetz Center for Dynamical Systems) Seminar, Brown University.

(2023/04) PDE and Applied Math Seminar, Drexel University.

(2022/06) Conference in Honor of the 80th Birthday of S. R. S. Varadhan, Seoul National University, KR.

(2022/04) Probability and Statistics Seminar, University of Kansas.

(2022/04) Stochastics Seminar, University of Utah.

(2021/12) Conference: "Frontier Probability Days", University of Nevada.

(2021/07) Asian Mathematical Conference, Halong, VN.[1]

(2021/03) Mathematics Colloquium, Galatasaray University, TR.

(2020/11) Probability Seminar, MIT.

(2020/05) Workshop: "Stochastic Analysis Related to Hamilton-Jacobi PDEs", IPAM, UCLA.

(2019/11) Probability Seminar, Cornell University.

(2019/04) Probability Seminar, Purdue University.

(2019/04) Probability Seminar, Northwestern University.

(2019/04) Probability and Statistical Physics Seminar, University of Chicago.

(2019/02) Mathematical Finance and Probability Seminar, Rutgers University.

(2019/02) Analysis Seminar, Temple University.

(2019/02) Stochastics Seminar, Georgia Institute of Technology.

(2018/11) Probability Seminar, Pontifical Catholic University of Chile, CL.

(2018/08) Conference: "Random Walks in Random Environments", Texas A&M University.

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[1]canceled due to the COVID-19 pandemic

(2018/07) Minisymposium: "Stochastic Dynamics on Graphs", SIAM Annual Meeting, Oregon.

(2017/12) Mathematics Colloquium, Temple University.

(2017/10) Probability Seminar, Temple University (joint w/ University of Pennsylvania).

(2017/10) Probability Seminar, Columbia University.

(2017/10) Probability and Mathematical Physics Seminar, Courant Institute, NYU.

(2017/09) Probability Seminar, City University of New York.

(2017/06) Probability Seminar, University of Cologne, DE.

(2017/06) Mathematics of Emergent Effects (SFB) Seminar, University of Bonn, DE.

(2017/06) Statistical Mechanics Seminar, University of Warwick, UK.

(2017/01) Workshop: "Random Walks in Dynamic Random Environment", University of Bristol, UK.[2]

(2016/12) Conference in Honor of Francis Comets on his 60th Birthday, San Pedro de Atacama, CL.[2]

(2016/08) Conference in Honor of the 75th Birthday of S. R. S. Varadhan, TU Berlin, DE.

(2016/04) Geometric Functional Analysis and Probability Seminar, Weizmann Institute, IL.

(2016/01) Workshop: "Inhomogeneous Random Systems", Institut Henri Poincaré, FR.

(2015/03) Workshop: "Random Walk in Random Environment", EURANDOM, NL.

(2015/03) Mathematics Colloquium, Istanbul University, TR.

(2015/03) Mathematics Colloquium, Istanbul Technical University, TR.

(2015/01) Mathematics Colloquium, Koç University, TR.

(2014/09) Workshop: "Homogenization and Random Phenomena", Institut Mittag-Leffler, SE.

(2013/11) Mathematics Colloquium, Institute of Applied Mathematics, METU, TR.

(2013/11) Mathematics Colloquium, Koç University, TR.

(2013/10) Seminar on Stochastic Processes, TU Berlin, DE.

(2013/03) Istanbul Analysis Seminar, Sabancı University, TR.

(2013/01) Mathematics Colloquium, Mimar Sinan University, TR.

(2012/05) Analysis Seminar, Bilkent University, TR.

(2012/04) Probability Seminar, Brown University.

(2012/02) Stochastics Seminar, University of Utah.

(2011/10) Mathematics Colloquium, Istanbul Bilgi University, TR.

(2011/09) TMD 24th National Mathematics Symposium, Uludağ University, TR.

(2011/07) Conference in Honor of 70th Birthday of S. R. S. Varadhan, National Taiwan University, TW.

(2011/06) Istanbul Statistical Physics Days, Sabancı University, TR.

(2011/02) Conference: "Interacting Processes in Random Environments", Fields Institute, CA.[2]

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[2]could not attend due to unforeseen circumstances

(2010/07) Pacific Rim Conference on Mathematics, Stanford University.

(2010/06) Mathematics Colloquium, Boğaziçi University, TR.

(2010/06) Mathematics Colloquium, Koç University, TR.

(2010/06) Mathematics Colloquium, Sabancı University, TR.

(2010/03) Seminar on Stochastic Processes, ETH Zürich, CH.

(2010/03) Probability Seminar, Stanford University.

(2010/02) Probability Seminar, University of California, Berkeley.

(2009/10) Mathematical Physics and Probability Seminar, University of California, Davis.

(2009/06) Workshop: "Random Walks in Random Environments", University of British Columbia, CA.

(2009/06) Dynamics Seminar, Hebrew University, IL.

(2009/05) Geometric Functional Analysis and Probability Seminar, Weizmann Institute, IL.

(2009/04) Mathematics Colloquium, Istanbul Center for Mathematical Sciences, TR.

(2008/12) Seminar in Probability and Stochastic Processes, Technion, IL.

(2008/12) Mathematics Colloquium, Sabancı University, TR.

(2008/12) Mathematics Colloquium, Istanbul Center for Mathematical Sciences, TR.

(2008/12) Mathematics Colloquium, Boğaziçi University, TR.

(2008/04) Mathematical Physics Seminar, University of Arizona.

(2008/03) Probability and Mathematical Physics Seminar, Courant Institute, NYU.

(2008/01) Geometric Functional Analysis and Probability Seminar, Weizmann Institute, IL.

(2008/01) Stochastics Seminar, University of Utah.

Teaching experience

2018 –   Temple University.

Undergraduate level: Calculus I; Probability Theory I ($\times 2$); Probability Theory II (Stochastic Processes) ($\times 5$); Complex Analysis; Junior Individual Study.

Graduate level: Probability Theory ($\times 2$); Advanced Probability Theory (Stochastic Processes) ($\times 2$); Stochastic Calculus ($\times 2$); Hamilton-Jacobi Equations (reading course) ($\times 3$).

2017 – 2018. Courant Institute, NYU.

Undergraduate level: Calculus II ($\times 2$); Analysis ($\times 2$).

2015 – 2017. Koç University.

Undergraduate level: Statistics ($\times 4$); Statistics for Science Majors; Probability Theory.
Graduate level: Real Analysis I; Real Analysis II; Markov Processes (reading course).

2013 – 2014. Turkish Mathematical Society Summer School, Nesin Mathematics Village.

Undergraduate level: The Poisson Process.

Graduate level: Introduction to Large Deviations.

2011 – 2015. Boğaziçi University.

Undergraduate level: Calculus for Mathematics Majors I; Calculus for Mathematics Majors II ($\times 2$); Multivariable Calculus ($\times 4$); Probability Theory ($\times 2$); Statistics ($\times 2$).

Graduate level: Real Analysis I ($\times 2$); Real Analysis II; Probability Theory; Probability for M.S. Students in Financial Engineering.

2009 – 2011. UC Berkeley.

Undergraduate level: Analysis I ($\times 2$); Analysis II; Complex Analysis ($\times 2$).

Graduate level: Real Analysis I.

2003 – 2008. Courant Institute, NYU.

Undergraduate level: Calculus I.

Graduate level: Semester-long workshop on Ph.D. qualifying exams; mini workshop on Probability for M.S. students in Mathematical Finance ($\times 2$).

Teaching Assistant: Calculus with Applications to Business and Economics; Computers in Biology and Medicine; Introduction to Mathematical Analysis; Complex Variables; Advanced Linear Algebra; Stochastic Calculus ($\times 3$).

Supervision

Ph.D. students (Temple University):

2024 –   Nizar Bou Ezz, TBA.

2023 –   Lancelot Leung, TBA.

2021 – 2024. Abdurrahman (Apo) Demirelli, Stochastic homogenization of nonconvex Hamilton-Jacobi equations in one dimension.

Ph.D. thesis advisory committees (Temple University):

2023 – 2024. Tantrik Mukerji, Applications of Gaussian fields to the permanent and the matching polynomial.
(*Advisor:* W.-S. Yang, Department of Mathematics.)

2019 – 2020. Joshua Finkelstein, Accurate Langevin integration methods for coarse-grained molecular dynamics with large time steps.
(*Advisor:* B. Seibold, Department of Mathematics.)

Ph.D. thesis advisory committees (Turkish Council of Higher Education):

2016 – 2018. Fatih Kangal, Large-scale eigenvalue optimization and applications.
(*Advisor:* E. Mengi, Koç University Department of Mathematics.)

2016 – 2017. Polat Charyyev, The optimal obstacle placement with disambiguation problem.
(*Advisor:* E. Ceyhan, North Carolina State University Department of Statistics.)

2014 – 2017. Emel Savku, Advances in optimal control of Markov regime-switching models.
(*Advisor:* G. W. Weber, METU Institute of Applied Mathematics.)

2012 – 2018. Uğur Küçük, Advised finite automata.
(*Advisor:* C. Say, Boğaziçi University Department of Computer Engineering.)

2012 – 2016. Orhan Sönmez, Monte Carlo methods for model-based reinforcement learning.
(*Advisor:* A. T. Cemgil, Boğaziçi University Department of Computer Engineering.)

M.S. students (Turkey):

2016 – 2019. Murad Ramanovski (Koç University), Diffusion limit of the Poisson encounter-mating model.

2013 – 2015. Sergazy Nurbavliyev (Boğaziçi University), Disorder regimes of directed polymers: lattice case versus tree case.

2013 – 2015. Mehmet Yenisey (Boğaziçi University), Large deviation principles for Markov chains and for strongly additive arithmetic functions.

M.S. thesis advisory committees (Temple University):

2023 – 2024. Richard Ninness, Random matrices and partitions.
(*Advisor:* B. Rider, Department of Mathematics.)

2020 – 2021. Piyush Borole, CalciumSim: Simulator for calcium dynamics on neuron graphs using dimensionally reduced model.
(*Advisor:* G. Queisser, Department of Mathematics.)

Undergraduate independent study (Temple University):

2018 – 2019. Victorya (Tory) Richardson, Random walks on networks for gene/protein set enrichment analysis (supervised jointly with R. Kulathinal, Department of Biology).

Senior undergraduate project supervision (Boğaziçi University):

2014 – 2015. Sevde Nur Şeker, Maximum likelihood estimation and some applications; Hilal Tüysüz, The Poisson process; Kenan Usta, The bootstrap method and some applications.

2013 – 2014. Sümeyra Altınok, The Cramér-Rao theorem and its applications; Burçin Bademci, Linear regression and the Moore-Penrose pseudoinverse; Neslihan Başaran, Stochastic encounter-mating models in population dynamics; Seval Bıkmaz, Prediction and entropy of printed English; Çiğdem Çin, Two cultures in statistics — Bayesian vs. frequentist; Seleme Nizam, Information theory meets differential geometry; Hilal Yıldırım, The dynamic interaction model in population dynamics.

2012 – 2013. Sümeyra Akın, Record breaking processes; Ömer Aktepe, Large deviations for IID random variables; Esra Dönmez, Kelly's formula; Meral Ocak, Importance sampling for rare events; İlhan Tatar, The almost sure martingale convergence theorem.

2011 – 2012. Merve Akdeniz, Google's PageRank algorithm; Sergazy Nurbavliyev, The optimal stopping problem.

University service

2024 –   Dean's advisory committee, College of Science and Technology, Temple University.

2024 –   Undergraduate committee, Department of Mathematics, Temple University.

2022 – 2023. Probability postdoc search committee, Department of Mathematics, Temple University.

2021 – 2024. Executive committee, Department of Mathematics, Temple University.

2020 – 2022. Faculty mentoring program for undergrads, Department of Mathematics, Temple University.

2018 –   Graduate committee, Department of Mathematics, Temple University.

2018 –   Faculty oversight committees (graduate), Department of Mathematics, Temple University.

2016 – 2017. Vice chair, Department of Mathematics, Koç University.

2016 – 2017. Faculty search committee, Department of Mathematics, Koç University.

2016 – 2017. Freshman advisor, Department of Mathematics, Koç University.

2016 – 2017. Double major advisor, Department of Mathematics, Koç University.

2015 – 2016. Curriculum committee, Department of Mathematics, Koç University.

2014 – 2015. Curriculum committee, Department of Mathematics, Boğaziçi University.

2012 – 2015. Double major advisor, Department of Mathematics, Boğaziçi University.

2012 – 2015. Graduate committee, Department of Mathematics, Boğaziçi University.

2011 – 2016. Management committee, Istanbul Center for Mathematical Sciences (IMBM).

Synergistic activities and memberships

2024 –   Scientific committee, Northeast Probability Seminar.

2023 –   Subcommittee on cultural and social activities, Int'l Congress of Mathematicians 2026.

2021 – 2024. Co-organizer, Grosswald Lectures, Department of Mathematics, Temple University.

2018 –   Co-organizer, Probability Seminar, Temple University (joint w/ University of Pennsylvania).

2018 – 2023. Organizer and co-organizer, Colloquium, Department of Mathematics, Temple University.

2016. Co-organizer, Şirince International Summer School in Mathematical Physics.[3]

2015. Co-organizer, Mini-workshop: "Population Dynamics", IMBM.

2015. Scientific committee, Turkish Mathematical Society 28th National Mathematics Symposium.

2014. Scientific committee, Turkish Mathematical Society 27th National Mathematics Symposium.

2014 – 2016. Co-founder and co-organizer, Ankara-Istanbul Workshops on Stochastic Processes.

2012. Organizer, International workshop: "Random Networks and Environments", IMBM.

2011 – 2015. Founder and organizer, IMBM Occasional Probability Seminar.

2011 –   Member of the Turkish Mathematical Society.

2003 –   Member of the American Mathematical Society.

Member of one proposal review panel, DMS, National Science Foundation of the United States.

Member of one proposal review panel, BAGEP, Science Academy (*Bilim Akademisi*) of Turkey.

Reviewer for the Travel Support for Mathematicians program, Simons Foundation.

Reviewer for the Canada Research Chairs program, Government of Canada.

Reviewer for the Collaborative Research program, German Israeli Foundation.

Reviewer for the following journals and proceedings:

Analysis & Partial Differential Equations;
Annales de l'Institut Henri Poincaré, Probabilités et Statistiques;
Annals of Applied Probability;
Annals of Probability;

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[3]canceled due to security reasons

Bernoulli;

Communications in Mathematical Physics;

Contemporary Mathematics;

Electronic Communications in Probability;

Electronic Journal of Probability;

Hacettepe Journal of Mathematics and Statistics;

Journal of Differential Equations;

Journal of Theoretical Probability;

Matematik Dünyası;

Potential Analysis;

Probability Theory and Related Fields;

Stochastic Processes and their Applications;

Turkish Journal of Mathematics.

Last updated: September 1, 2024