

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; stochastic homogenization, Hamilton-Jacobi equations; related topics in statistical mechanics, optimal control and population dynamics.

Academic degrees

- 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, 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

- 2022 – 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

- (A. Yilmaz) Stochastic homogenization of a class of quasiconvex viscous Hamilton-Jacobi equations in one space dimension. *J. Differential Equations*, **300**, 660–691, 2021.
- (A. Yilmaz) 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. Yilmaz, O. Zeitouni) Homogenization of a class of one-dimensional nonconvex viscous Hamilton-Jacobi equations with random potential. *Comm. PDE*, **45**, 32–56, 2020.
- (A. Yilmaz, 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. Yilmaz) 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. Yilmaz) Fluid limit for the Poisson encounter-mating model. *Adv. in Appl. Probab.*, **49**, 1201–1229, 2017.
- (F. Rassoul-Agha, T. Seppäläinen, A. Yilmaz) Variational formulas and disorder regimes of random walks in random potentials. *Bernoulli*, **23**, 405–431, 2017.
- (O. Gün, A. Yilmaz) The stochastic encounter-mating model. *Acta Appl. Math.*, **148**, 71–102, 2017.
- (N. Georgiou, F. Rassoul-Agha, T. Seppäläinen, A. Yilmaz) Ratios of partition functions for the log-gamma polymer. *Ann. Probab.*, **43**, 2282–2331, 2015.
- (F. Rassoul-Agha, T. Seppäläinen, A. Yilmaz) Quenched free energy and large deviations for random walks in random potentials. *Comm. Pure Appl. Math.*, **66**, 202–244, 2013.
- (A. Yilmaz) 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. Yilmaz) 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. Yilmaz, 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. Yilmaz) Averaged large deviations for random walk in a random environment. *Ann. Inst. H. Poincaré Probab. Statist.*, **46**, 853–868, 2010.
- (A. Yilmaz) Quenched large deviations for random walk in a random environment. *Comm. Pure Appl. Math.*, **62**, 1033–1075, 2009.
- (A. Yilmaz) Large deviations for random walk in a space-time product environment. *Ann. Probab.*, **37**, 189–205, 2009.
- (A. Yilmaz) 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

- (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.

(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.

¹canceled due to the COVID-19 pandemic

²could not attend due to unforeseen circumstances

(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
(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: Probability Theory I; Probability Theory II ($\times 4$); Junior Individual Study.

Graduate level: Probability Theory ($\times 2$); Advanced Probability Theory; Stochastic Calculus w/ Applications in Finance; Hamilton-Jacobi Equations (reading course).

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 ($\times 2$); Stochastic Calculus for Mathematical Finance.

Supervision

Ph.D. thesis supervision:

2021 – Abdurrahman Demirelli (Temple University).

Ph.D. thesis monitoring 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. thesis supervision:

- 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.

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

- 2021 – Executive committee, Department of Mathematics, Temple University.
- 2018 – Graduate committee, Department of Mathematics, Temple University.
- 2018 – Faculty oversight committees, 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

- 2022 – Co-organizer, Colloquium, Department of Mathematics, Temple University.
- 2021 – Co-organizer, Grosswald Lectures, Department of Mathematics, Temple University.
- 2019 – 2022. Organizer, Colloquium, Department of Mathematics, Temple University.
- 2018 – Co-organizer, Probability Seminar, Temple University (joint w/ University of Pennsylvania).
- 2018 – 2019. Co-organizer, Colloquium, Department of Mathematics, Temple University.
- 2016. Co-organizer, Şirince Summer School in Mathematical Physics.³
- 2015. Co-organizer, Mini-workshop: “Population Dynamics”, IMBM.
- 2015. Scientific committee, TMD 28th National Mathematics Symposium.
- 2014. Scientific committee, TMD 27th National Mathematics Symposium.
- 2014 – 2016. Co-founder and co-organizer, Ankara-Istanbul Workshops on Stochastic Processes.
- 2012. Organizer, Workshop: “Random Networks and Environments”, IMBM.
- 2011 – 2015. Founder and organizer, IMBM Occasional Probability Seminar.
- 2011 – Member of the Turkish Mathematical Society (TMD).
- 2003 – Member of the American Mathematical Society (AMS).

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

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

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;
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: August 30, 2022

³canceled due to security reasons