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Miklós Z. Rácz

Research Interests

Broadly at the interface of probability, statistics, computer science, and information theory, with a focus on **combinatorial statistics**, **discrete probability**, and **applied probability**.

Employment

2023 Jan — **Northwestern University**, Evanston, IL, USA.
Assistant Professor, Department of Statistics and Data Science
Assistant Professor, Department of Computer Science

2017 — 2022 Dec **Princeton University**, Princeton, NJ, USA.
Assistant Professor, ORFE Department
Associated Faculty, Center for Statistics and Machine Learning (CSML), 2019 — 2022

2015 — 2017 **Microsoft Research**, Redmond, WA, USA.
Postdoctoral Researcher, Theory Group

Education

2010 — 2015 **PhD**, Statistics, **University of California, Berkeley**.

MS, Computer Science, **University of California, Berkeley**.
Dissertation (PhD): *Influences in Voting and Growing Networks*
Thesis (MS): *A quantitative Gibbard-Satterthwaite theorem without neutrality*
Advisor: Elchanan Mossel

2005 — 2010 **MS**, Mathematics, **Budapest University of Technology and Economics (BUTE)**.
Thesis: *Competing Prices: Analyzing a Stochastic Interacting Particle System*
Advisors: Márton Balázs and Bálint Tóth

1999 — 2005 **Fazekas Mihály High School**, Budapest, Hungary.
Special mathematics class, graduated with honors

Further Experience

Spring 2025 **Simons Laufer Mathematical Sciences Institute (SLMath/MSRI)**, Berkeley, CA.
Research Member in the Probability and Statistics of Discrete Structures program

2017 — 2022 **Microsoft Research**, Redmond, WA.
Consulting Researcher

Fall 2020 **Simons Institute for the Theory of Computing**, Berkeley, CA.
Visiting Scientist in the Probability, Geometry, and Computation in High Dimensions program

2015 — 2017 **Microsoft Research**, Redmond, WA & **University of Washington**, Seattle, WA.
Mentor: Sergey Yekhanin
I worked on statistical error correction algorithms for DNA sequencing.
This is part of a larger MSR-UW group effort to make DNA Storage a reality. DNA Storage aims to use synthetic DNA as a high-density, durable, and easy-to-manipulate storage medium of digital data.

Summer 2014 **Microsoft Research**, Redmond, WA.

Mentor: Sébastien Bubeck

I was a research intern in the Theory Group, working on statistical inference problems on random graphs.

Summer 2009 **University of Oxford**, Oxford, UK.

Mentors: Jotun Hein, Rune Lyngsø, and István Miklós

I was a summer research student in the Department of Statistics, working on the infinite sites model in population genetics.

Summer 2008 **University of California, Los Angeles**, CA.

Mentors: Susana Serna and Gilles Gnacadja

I was a summer research student in the Research in Industrial Projects for Students (RIPS) program at the Institute for Pure and Applied Mathematics (IPAM). I worked on a team of four students, modeling and measuring unstable behavior in hematopoiesis.

Awards and Honors

For teaching

- Princeton Engineering Commendation List for Outstanding Teaching, 2021

  For the teaching of ORF 387: Networks in Spring 2021.
- Princeton Engineering Commendation List for Outstanding Teaching, 2021

  For the teaching of ORF 526: Probability Theory in Fall 2020.
- Princeton Engineering Commendation List for Outstanding Teaching, 2020

  For the teaching of ORF 387: Networks in Spring 2020.
- Princeton Engineering Commendation List for Outstanding Teaching, 2020

  For the teaching of ORF 526: Probability Theory in Fall 2019.
- Excellence in Teaching Award, Princeton University, 2020

  Student-run and student-selected teaching award, given by Princeton's Undergraduate and Graduate Engineering Councils for the teaching of ORF 350: Analysis of Big Data in Spring 2019.
- 250th Anniversary Fund for Innovation in Undergraduate Education, Princeton University, 2019
- Outstanding Graduate Student Instructor Award, UC Berkeley, 2014 - 2015

For research

- Markov Lecture Discussant, Applied Probability Society, 2022
- Howard B. Wentz, Jr. Junior Faculty Award, Princeton University, 2020
- Princeton SEAS Innovation Award, 2019
- UC Berkeley Graduate Fellowship, 2010 - 2012
- Scholarship of the Hungarian Republic, 2009 - 2010
- SIAM Award for Outstanding Talk in Applied Mathematics, MAA MathFest 2009
- Outstanding Student of the Faculty of Natural Sciences, BUTE, 2008 - 2009
- Second Prize, National Scientific Student Conference, Hungary, April 2009
- Scholarship of the Faculty of Natural Sciences, BUTE, Fall 2008, Spring 2009

Funding and Grants

- Princeton University SEAS Innovation Research Grant, *Network Disruption and the Spread of Misinformation*, $60k, 2019 - 2021
- Princeton University 250th Anniversary Fund for Innovation in Undergraduate Education Grant, *Networks: Connecting the ORFE Undergraduate Curriculum*, $23k, 2019
- NSF grant DMS 1811724, *Dynamic Networks: Probabilistic Models and Inference Problems*, $180k, 2018 - 2021

Publications and Preprints

[42] **Harnessing Multiple Correlated Networks for Exact Community Recovery**
Miklós Z. Rácz and Jifan Zhang
Advances in Neural Information Processing Systems (NeurIPS), accepted/forthcoming, 2024.

[41] **Efficient Graph Matching for Correlated Stochastic Block Models**
Shuwen Chai and Miklós Z. Rácz
Advances in Neural Information Processing Systems (NeurIPS), accepted/forthcoming, 2024.

[40] **Average-case and smoothed analysis of graph isomorphism**
* Previous version titled "Local canonical labeling of Erdős–Rényi random graphs"
Julia Gaudio, Miklós Z. Rácz, and Anirudh Sridhar
Submitted, 2023.

[39] **Matching Correlated Inhomogeneous Random Graphs Using the k-Core Estimator**
Miklós Z. Rácz and Anirudh Sridhar
IEEE International Symposium on Information Theory (ISIT), 2023.

[38] **Towards Consensus: Reducing Polarization by Perturbing Social Networks**
Miklós Z. Rácz and Daniel E. Rigobon
IEEE Transactions on Network Science and Engineering, 10(6):3450–3464, 2023.

[37] **Exact Community Recovery in Correlated Stochastic Block Models**
Julia Gaudio, Miklós Z. Rácz, and Anirudh Sridhar
Conference on Learning Theory (COLT), 2022.

[36] **A probabilistic view of latent space graphs and phase transitions**
Suqi Liu and Miklós Z. Rácz
Bernoulli, 29(3):2417–2441, 2023.

[35] **Correlated Stochastic Block Models: Exact Graph Matching with Applications to Recovering Communities**
Miklós Z. Rácz and Anirudh Sridhar
Advances in Neural Information Processing Systems (NeurIPS), 2021.
Selected for a spotlight presentation (top 3% of submissions).

[34] **Phase transition in noisy high-dimensional random geometric graphs**
Suqi Liu and Miklós Z. Rácz
Electronic Journal of Statistics, 17(2):3512–3574, 2023.

[33] **Tree trace reconstruction using subtraces**
Tatiana Brailovskaya and Miklós Z. Rácz
Journal of Applied Probability, 60(2):629–641, 2023.

[32] **Approximate Trace Reconstruction: Algorithms**
Sami Davies, Miklós Z. Rácz, Cyrus Rashtchian, and Benjamin G. Schiffer
IEEE International Symposium on Information Theory (ISIT), 2021.

[31] **Batch Optimization for DNA Synthesis**
Konstantin Makarychev, Miklós Z. Rácz, Cyrus Rashtchian, and Sergey Yekhanin
IEEE Transactions on Information Theory, 68(11):7454–7470, 2022.
Extended abstract at the *IEEE International Symposium on Information Theory (ISIT)*, 2021.

[30] **Correlated randomly growing graphs**
Miklós Z. Rácz and Anirudh Sridhar
Annals of Applied Probability, 32(2):1058–1111, 2022.

[29] **An adversarial model of network disruption: maximizing disagreement and polarization in social networks**
Mayee F. Chen and Miklós Z. Rácz
IEEE Transactions on Network Science and Engineering, 9(2):728–739, 2022.

[28] **Rumor source detection with multiple observations under adaptive diffusions**
Miklós Z. Rácz and Jacob Richey
IEEE Transactions on Network Science and Engineering, 8(1):2–12, 2021.

[27] **Reconstructing Trees from Traces**
Sami Davies, Miklós Z. Rácz, and Cyrus Rashtchian
Annals of Applied Probability, 31(6): 2772–2810, 2021.
An extended abstract appeared at the *Conference on Learning Theory (COLT)*, 2019.

[26] **Finding a planted clique by adaptive probing**
Miklós Z. Rácz and Benjamin Schiffer
ALEA Latin American Journal of Probability and Mathematical Statistics, 17:775–790, 2020.

[25] **Finding cliques using few probes**
Uriel Feige, David Gamarnik, Joe Neeman, Miklós Z. Rácz, and Prasad Tetali
Random Structures & Algorithms, 56(1):142–153, 2020.

[24] **DNA assembly for nanopore data storage readout**
Randolph Lopez, Yuan-Jyue Chen, Siena Dumas Ang, Sergey Yekhanin, Konstantin Makarychev, Miklós Z. Rácz, Georg Seelig, Karin Strauss, and Luis Ceze
Nature Communications, 10:2933, 2019.

[23] **How fragile are information cascades?**
Yuval Peres, Miklós Z. Rácz, Allan Sly, and Izabella Stuhl
Annals of Applied Probability, 30(6):2796–2814, 2020.

[22] **Geographic and Temporal Trends in Fake News Consumption During the 2016 US Presidential Election**
Adam Fourney*, Miklós Z. Rácz*, Gireeja Ranade*, Markus Mobius, Eric Horvitz
International Conference on Information and Knowledge Management (CIKM), 2017.
* These authors contributed equally and are presented in alphabetical order.

[21] **Clustering Billions of Reads for DNA Data Storage**
Cyrus Rashtchian, Konstantin Makarychev, Miklós Rácz, Siena Dumas Ang, Djordje Jevdjic, Sergey Yekhanin, Luis Ceze, and Karin Strauss
Advances in Neural Information Processing Systems (NeurIPS), 2017.
Selected for a spotlight presentation (top 4.7% of submissions).

[20] **Optimal control for diffusions on graphs**
Laura Florescu, Yuval Peres, and Miklós Z. Rácz
SIAM Journal on Discrete Mathematics, 32(4):2941–2972, 2018.

[19] **Scaling up DNA data storage and random access retrieval**
Lee Organick, Siena Dumas Ang, Yuan-Jyue Chen, Randolph Lopez, Sergey Yekhanin, Konstantin Makarychev, Miklós Z. Rácz, Govinda Kamath, Parikshit Gopalan, Bichlien Nguyen, Christopher Takahashi, Sharon Newman, Hsing-Yeh Parker, Cyrus Rashtchian, Kendall Stewart, Gagan Gupta, Robert Carlson, John Mulligan, Douglas Carmean, Georg Seelig, Luis Ceze, and Karin Strauss
Nature Biotechnology, 36:242–248, 2018.

[18] **A smooth transition from Wishart to GOE**
Miklós Z. Rácz and Jacob Richey
Journal of Theoretical Probability, 32(2):898–906, 2019.

[17] **Basic models and questions in statistical network analysis**
Miklós Z. Rácz and Sébastien Bubeck
Statistics Surveys, 11:1–47, 2017.

[16] **Rate-limited control of systems with unknown gain**
Victoria Kostina, Yuval Peres, Miklós Z. Rácz, and Gireeja Ranade
IEEE Allerton Conference on Communication, Control, and Computing, 2016.

[15] **Sequence assembly from corrupted shotgun reads**
Shirshendu Ganguly, Elchanan Mossel, and Miklós Z. Rácz
IEEE International Symposium on Information Theory (ISIT), 2016.

[14] **Beta-gamma tail asymptotics**
Jim Pitman and Miklós Z. Rácz
Electronic Communications in Probability, 20(84):1–7, 2015.

[13] **Braess's paradox for the spectral gap in random graphs and delocalization of eigenvectors**
Ronen Eldan, Miklós Z. Rácz, and Tselil Schramm
Random Structures & Algorithms, 50(4):584–611, 2017.

[12] **Testing for high-dimensional geometry in random graphs**
Sébastien Bubeck, Jian Ding, Ronen Eldan, and Miklós Z. Rácz
Random Structures & Algorithms, 49(3):503–532, 2016.

[11] **From trees to seeds: on the inference of the seed from large trees in the uniform attachment model**
Sébastien Bubeck, Ronen Eldan, Elchanan Mossel, and Miklós Z. Rácz
Bernoulli, 23(4A):2887–2916, 2017.

[10] **Can one hear the shape of a population history?**
Junhyong Kim, Elchanan Mossel, Miklós Z. Rácz, and Nathan Ross
Theoretical Population Biology, 100:26–38, 2015.

[9] **On the influence of the seed graph in the preferential attachment model**
Sébastien Bubeck, Elchanan Mossel, and Miklós Z. Rácz
IEEE Transactions on Network Science and Engineering, 2(1):30–39, 2015.

[8] **Coexistence in preferential attachment networks**
Tonći Antunović, Elchanan Mossel, and Miklós Z. Rácz
Combinatorics, Probability and Computing, 25(6):797–822, 2016.

[7] **Dynamic Budget-Constrained Pricing in the Cloud**
Eric Friedman, Miklós Z. Rácz, and Scott Shenker
Canadian Conference on Artificial Intelligence, 2015.

[6] **Multidimensional sticky Brownian motions as limits of exclusion processes**
Miklós Z. Rácz and Mykhaylo Shkolnikov
Annals of Applied Probability, 25(3):1155–1188, 2015.

[5] **A Smooth Transition from Powerlessness to Absolute Power**
Elchanan Mossel, Ariel D. Procaccia, and Miklós Z. Rácz
Journal of Artificial Intelligence Research, 48:923–951, 2013.

[4] **Election Manipulation: The Average Case**
Elchanan Mossel and Miklós Z. Rácz
ACM SIGecom Exchanges, 11(2):22–24, 2012.

[3] **A quantitative Gibbard-Satterthwaite theorem without neutrality**
Elchanan Mossel and Miklós Z. Rácz
Combinatorica, 35(3):317–387, 2015.
An extended abstract appeared at the *Symposium on Theory of Computing (STOC)*, 2012.

[2] **Modeling Flocks and Prices: Jumping Particles with an Attractive Interaction**
Márton Balázs, Miklós Z. Rácz, and Bálint Tóth
Annales de l'Institut Henri Poincaré – Probabilités et Statistiques, 50(2):425–454, 2014.

[1] **Analysis of unstable behavior in a mathematical model for erythropoiesis**
Susana Serna, Jasmine A. Nirody, and Miklós Z. Rácz
Journal of Mathematical Biology, 66(3):595–625, 2013.

Teaching

Graduate teaching

Fall 2024 **STAT 430-1: Probability for Statistical Inference 1**, Northwestern University.
I am the Instructor for this graduate course on probability theory with an eye towards statistical inference.

Winters 2023 & 2024 **STAT 430-2: Probability for Statistical Inference 2**, Northwestern University.
I was the Instructor for this graduate course on probability theory with an eye towards statistical inference.

Fall 2023 **CS 496: Learning in Networks**, Northwestern University.
I introduced, developed, and was the Instructor for this graduate topics course on learning in networks.

Falls 2017—2021 **ORF 526: Probability Theory**, Princeton University.
I was the Instructor for this graduate introduction to probability theory with a focus on stochastic processes.

Summer 2016 **Basic models and questions in statistical network analysis**.
I co-designed (together with Sébastien Bubeck) this graduate minicourse, consisting of five one-hour lectures, which aim to explain in an elementary way some of the key ideas involved in cutting-edge statistical network analysis research. I also wrote lecture notes which are published in *Statistics Surveys* and available online (38 pages, 10 figures). I taught this minicourse twice:

- **June 6 – 10, 2016: University of Washington**
  Approx. 30 graduate students attended from a variety of departments (math, stat, CS, EE).
- **July 4 – 8, 2016: XX Brazilian School of Probability**
  Approx. 100 participants attended, ranging from masters students to professors.

Summer 2013 **Probability Models of Information Exchange on Networks**, Cornell University.
I designed and led a tutorial session for Elchanan Mossel's short course at the Cornell Probability Summer School.

Undergraduate teaching

Fall 2024 **CS 212: Mathematical Foundations of Computer Science Part 1: Discrete Mathematics for Computer Science**, Northwestern University.
I am a co-Instructor (with Anjali Agarwal) for this core undergraduate course that introduces the mathematical foundations of computer science, focusing on discrete mathematics.

Springs 2020—2022 **ORF 387: Networks**, Princeton University.
I introduced, developed, and was the Instructor for this undergraduate course that showcases how networks are widespread in society, technology, and nature, via a mix of theory and applications.

Spring 2019 **ORF 350: Analysis of Big Data**, Princeton University.
I was the Instructor for this undergraduate course that introduces statistical principles and computational tools for analyzing data.

Spring 2018 **ORF 309: Probability and Stochastic Systems**, Princeton University.
I was the Instructor for this undergraduate introduction to probability and its applications.

Spring 2014 **Stat 150: Stochastic Processes**, UC Berkeley.
I was a Graduate Student Instructor (GSI) for this upper-division course of approx. 60 students, taught by Ani Adhikari. I designed and led weekly discussion sections and held office hours.

Spring 2013 **Stat 155: Game Theory**, UC Berkeley.
I was a Graduate Student Instructor (GSI) for this upper-division course of approx. 60 students, taught by Elchanan Mossel. I designed and led weekly discussion sections, held office hours, and graded homework, quizzes, and exams.

Summer 2011 **Stat W21: Introductory Statistics**, UC Berkeley.
I was a Graduate Student Instructor (GSI) for this lower-division course of approx. 250 students, taught by Philip Stark. This was an online course and I held in-person and online office hours.

2008 — 2009 **Calculus for civil engineer students**, Budapest University of Technology and Economics.
I was a Teaching Assistant for three semesters. I led discussion sections and graded exams.

2007 — 2010 **Mathematics Institute**, Budapest University of Technology and Economics.
I graded homework for various courses in calculus, linear algebra, algebra, and probability theory. I also served as a tutor at the walk-in tutoring center.

Advising and Mentoring

Graduate students (current)

Shuwen Chai, Northwestern University, Computer Science, PhD student.

Jifan Zhang, Northwestern University, Statistics and Data Science, PhD student.

Graduate students (former)

PhD, 2023 **Daniel E. Rigobon**, PhD in ORFE, Princeton University, 2023 (co-advised with R. Sircar).
Dissertation title: "Collective Good and Optimization in Socioeconomic Systems".
Now lecturer at Princeton University.

PhD, 2023 **Anirudh Sridhar**, PhD in ECE, Princeton University, 2023 (co-advised with H.V. Poor).
Dissertation title: "Inference of Cascades and Correlated Networks".
Now postdoc at MIT.

PhD, 2022 **Suqi Liu**, PhD in ORFE, Princeton University, 2022.
Dissertation title: "Geometry of Random Graphs".
Now postdoc at Harvard University.

2016 — 2017 **Jacob Richey**, PhD in Mathematics, University of Washington, 2020.
Then postdoc at UBC Mathematics, now postdoc at the Rényi Institute in Budapest.
I mentored Jacob while I was a postdoc at MSR (main advisor: Chris Hoffman).

Summer 2016 **Govinda Kamath**, PhD in EE, Stanford University, 2019.
Then postdoc at Microsoft Research New England, now at 10x Genomics.
Together with Sergey Yekhanin, I co-mentored Govinda's 12-week internship at Microsoft Research on a project involving statistical inference and coding theory problems in genomics, motivated by applications in DNA Storage. His work also included the analysis of a large DNA synthesis-sequencing dataset.

Undergraduate students (current)

2023 — present **Sophia Pi**, Northwestern University, Computer Science and Mathematical Methods in the Social Sciences

Undergraduate research advised at Northwestern University (former)

2023 — 2024 **Wei Sun**, Northwestern University, Computer Science & Psychology

Fall 2023 **Seung Hee Daniel Lee**, Northwestern University, Computer Science

Fall 2023 **Lisa Saltzberg**, Northwestern University, Computer Science

Fall 2023 **Ali Slayie**, Northwestern University, Data Science

Undergraduate senior theses advised at Princeton University

2022 — 2023 **Grant Lu**, Princeton University, ORFE

2022 — 2023 **Karena Yan**, Princeton University, ORFE, recipient of the **Frank S. Castellana Prize**, *awarded to a graduating senior for outstanding scholarship and academic achievement* (top ORFE prize), as well as the **Joseph Clifton Elgin Prize**, *awarded by the School of Engineering and Applied Science (SEAS) to a graduating senior who has done the most to advance the interests of the School in the community at large*. Now MS student at Harvard.

2021 — 2022 **Allen Liu**, Princeton University, ORFE

2021 — 2022 **Serena Ren**, Princeton University, ORFE, recipient of the **S. S. Wilks Memorial Prize**, *awarded to a graduating senior who has written the best thesis on statistics and its applications to solving societal problems*.

2021 — 2022 **Rachel Roesch**, Princeton University, ORFE, recipient of the **Sigma Xi Book Award**, *awarded for excellence in research, with research potential shown by a senior thesis*.

2020 — 2021 **Isabella Faccone**, Princeton University, ORFE, recipient of the **Procter & Gamble Prize**, *awarded to a graduating senior who has written the best thesis in operations research*.

2020 — 2021 **Zachary Holecek**, Princeton University, ORFE, recipient of the **Procter & Gamble Prize**, *awarded to a graduating senior who has written the best thesis in operations research*.

2020 — 2021 **Alan Wong**, Princeton University, ORFE, recipient of the **Kenneth H. Condit '13 Prize**, *awarded to a graduating senior who has demonstrated leadership through academic achievement and community service*.

2019 — 2020 **Adam Chang**, Princeton University, ORFE, recipient of the **Ahmet S. Çakmak Prize**, *awarded for a strong academic record and an innovative thesis*; the **Stanley J. Stein Senior Thesis Prize**, *awarded by the Program in Latin American Studies (PLAS) to the student who writes the best senior thesis on a Latin American-related topic*; as well as the **Joseph Clifton Elgin Prize**, *awarded by the School of Engineering and Applied Science (SEAS) to a graduating senior who has done the most to advance the interests of the School in the community at large*.

2019 — 2020 **Nicholas A.G. Johnson**, Princeton University, ORFE, **Valedictorian** of Princeton's Class of 2020; recipient of the **Frank S. Castellana Prize**, *awarded to a graduating senior for outstanding scholarship and academic achievement* (top ORFE prize); the **James Hayes-Edgar Palmer Prize**, *awarded by the School of Engineering and Applied Science (SEAS) to a graduating senior who has manifested excellent scholarship, a marked capacity for leadership, and promise of creative achievement in engineering*; as well as the **Challener Thesis Prize in Canadian Studies**. Now PhD student at MIT.

2019 — 2020 **Aslesha Parchure**, Princeton University, ORFE

2019 — 2020 **Benjamin Schiffer**, Princeton University, ORFE, recipient of the **Mack Angas Memorial Prize**, *awarded for outstanding senior thesis research*. Now PhD student at Harvard University.

2018 — 2019 **Patrick Chen**, Princeton University, ORFE

2018 — 2019 **Benjamin Laufer**, Princeton University, ORFE, recipient of the **Urban Studies Thesis Prize**, as well as the **Kenneth H. Condit '13 Prize**, *awarded to a graduating senior who has demonstrated leadership through academic achievement and community service*. Now PhD student at Cornell Tech.

2018 — 2019 **Timothy Thong**, Princeton University, ORFE

2018 Jan — Dec **José Pabón**, Princeton University, Mathematics

2017 — 2018 **Hassan Ejaz Chaudhry**, Princeton University, ORFE

2017 — 2018 **Kevin Sun**, Princeton University, ORFE, recipient of the **Frank S. Castellana Prize**, *awarded to a graduating senior for outstanding scholarship and academic achievement* (top ORFE prize).

2017 — 2018 **Eric Wu**, Princeton University, ORFE, recipient of the **Eric F.S. Pai '83 Prize**, *awarded to a graduating senior who has written the best thesis in finance*.

Undergraduate research advised at Princeton University

2020 — 2021 **Vydhourie R.T. Thiyageswaran**, Princeton University, Mathematics. Now PhD student at the University of Washington.

2018 — 2019 **Mayee Chen**, Princeton University, ORFE. Now PhD student at Stanford University.

2018 — 2019 **Benjamin Schiffer**, Princeton University, ORFE. Now PhD student at Harvard University.

Spring 2018 **Charlie Hou**, Princeton University, ORFE. Now PhD student at CMU.

Spring 2018 **Walter Li**, Princeton University, ORFE

Student Committees

At Northwestern University

I have served on the **PhD Prospectus Committee** for:

- Jifan Zhang, Statistics & Data Science, 2024

At Princeton University

I have served as a **Reader** of the PhD Thesis for:

- Jiacheng Zhang, ORFE, 2021
- Wenyan Gong, ORFE, 2020
- Thomas Pumir, ORFE, 2020
- Christy V. Graves, PACM, 2019
- Peiqi Wang, ORFE, 2018

I have served as a **Reader** of the Senior Thesis for:

- Byron Chin, Mathematics, 2021
- Vydhourie R.T. Thiyageswaran, Mathematics, 2021
- Heather Newman, Mathematics, 2019

I have served on the **Final Public Oral (FPO) Exam Committee** for:

- Daniel Rigobon, ORFE, 2023
- Anirudh Sridhar, ECE, 2023
- Suqi Liu, ORFE, 2022
- Daniel Gitelman, ORFE, 2022
- Guillaume Martinet, ORFE, 2021
- Danny (Dong Hoon) Nam, Mathematics, 2021
- Woon Sang Cho, ORFE, 2021
- Xiuneng Zhu, ORFE, 2018

I have served on the **General Exam Committee** for:

- Pierre Bayle, ORFE, 2020
- Daniel Rigobon, ORFE, 2020
- Igor Silin, ORFE, 2020
- Anirudh Sridhar, EE, 2020
- Zhi Jiang (Tony) Ye, ORFE, 2020
- Brian Cheung, ORFE, 2019
- Gökçe Dayanıklı, ORFE, 2019
- Shuangping Li, PACM, 2019
- Lirong Xue, ORFE, 2019
- Suqi Liu, ORFE, 2018
- Guillaume Martinet, ORFE, 2018

I have served on the **Preliminary Exam Committee** for:

- Jui-Hui Chung, PACM, 2022
- Qinxin Yan, PACM, 2022
- Tatiana Brailovskaya, PACM, 2020
- Dev Dabke, PACM, 2019
- Emily Walters, PACM, 2019
- Jad Rahme, PACM, 2018

I have served on the **Qualifying Exam Committee** for eight students in ORFE.

Elsewhere

I have served as a **Reader** of the PhD Thesis for:

- David Corlin Marchand, Mathematics, University of Paris-Saclay (France) and University of Fribourg (Switzerland), 2021
- Joona Karjalainen, Mathematics, Aalto University (Finland), 2021

I have served on the **Masters Thesis Exam Committee** for:

- Elisabetta Cornacchia, Applied Mathematics, EPFL (Switzerland), 2019

Selected Invited Talks

Future talks

- Stochastics and Influences Workshop on the occasion of Bálint Tóth's 70th birthday, Erdős Center, Rényi Institute, Budapest, Hungary — June 30 – July 2, 2025
- Introductory Workshop: Probability and Statistics of Discrete Structures, Simons Laufer Mathematical Sciences Institute (SLMath/MSRI), Berkeley, CA — January 27–31, 2025
- Information and Decision Sciences Seminar, University of Illinois Chicago November 1, 2024

The largest common subtree of uniform attachment trees

- Probability Seminar, University of Wisconsin, Madison — September 19, 2024
- **Plenary Talk**, Workshop on Randomness and Learning on Networks, IMPA, Rio de Janeiro, Brazil — August 1, 2024

Uniqueness of low-depth neighborhoods and implications for learning in networks

- Applied Probability Society Session on Learning and Decision Making with Network Data, INFORMS Annual Meeting, Phoenix, AZ — Oct 15, 2023

Correlated stochastic block models: graph matching and community recovery

- Complex Systems Seminar, Northwestern University — Jan 18, 2024

- Workshop on Probability and Combinatorics, Bellairs Research Institute, Holetown, Barbados Apr 13, 2023
- Probability Seminar, The City University of New York (CUNY) Mar 28, 2023
- Oxford Discrete Mathematics and Probability Seminar (online) Mar 7, 2023
- Workshop on Learning in Networks, BIRS Casa Matemática Oaxaca (CMO), Oaxaca, Mexico Nov 15, 2022
- Applied Probability Society Session on Matchings in Random Graphs, INFORMS Annual Meeting, Indianapolis, IN Oct 17, 2022
- RandNET Workshop on Random Graphs, Eindhoven, The Netherlands Aug 25, 2022
- Workshop on Critical and Collective Effects in Graphs and Networks, Falmouth, MA June 10, 2022
- Banff Workshop on Mathematical Statistics and Learning (online talk) Dec 2, 2021
- Statistics Seminar, Columbia University Nov 15, 2021
- Workshop on Algorithmic Advances for Statistical Inference with Combinatorial Structure, Simons Institute, Berkeley, CA October 11, 2021
- Combinatorics and Probability Seminar (online talk), Ohio State University Sep 30, 2021

Perturbing social networks: adversarial and optimistic perspectives

- MSIS Departmental Seminar, Rutgers University Business School March 30, 2023

An adversarial perspective on network disruption

- Operations Research Seminar (online talk), University of Pittsburgh March 25, 2021
- Workshop on Integrity in Social Networks and Media (online talk) March 12, 2021
- SPOR Seminar (online talk), Eindhoven, The Netherlands February 23, 2021

Correlated randomly growing graphs

- Statistics Seminar (online talk), University of Cambridge May 14, 2021
- PACM Colloquium (online talk), Princeton University March 22, 2021
- Special Session on Graphs in Data Science at the AMS Spring Southeastern Sectional Meeting (online talk) March 13, 2021
- Joint Probability Seminar (online talk), Duke & UNC October 22, 2020
- Mathematical Physics Seminar (online talk), Yeshiva University May 6, 2020
- Probability Seminar, Columbia University January 31, 2020
- Statistical Physics Holiday Seminar, Eötvös University (ELTE), Budapest December 27, 2019
- Probability Seminar, MIT December 2, 2019
- Special Session on Stochastic Evolution of Discrete Structures at the AMS Fall Eastern Sectional Meeting, Binghamton, NY October 13, 2019

Trace reconstruction problems with applications to DNA data storage

- MIFODS Workshop on Learning under Complex Structure, MIT January 27, 2020
- Special Session on Recent Trends in the Mathematics of Data at the AMS Fall Central Sectional Meeting, Madison, WI September 14, 2019

Finding cliques with few probes

- Combinatorics Seminar, Georgia Tech November 8, 2019
- Statistical Physics Holiday Seminar, Eötvös University (ELTE), Budapest December 28, 2018
- Probability Seminar, University of Oxford October 29, 2018

High-dimensional random geometric graphs

- Oxford - Princeton Workshop, Princeton, NJ — November 17, 2018
- Probability Seminar, University of Bristol — November 2, 2018
- Applied Probability Seminar, Columbia University — October 4, 2018
- Special Session on Probability, Combinatorics, and Statistical Mechanics at the AMS Fall Eastern Sectional Meeting, Newark, DE — September 30, 2018
- Workshop on Critical and Collective Effects in Graphs and Networks, Eindhoven, The Netherlands — June 22, 2018
- Research on Algorithms and Incentives in Networks (RAIN) Seminar, Stanford May 23, 2018
- Workshop on Combinatorial Statistics, CRM, Montreal, Canada — May 3, 2018
- Computational Statistics and Machine Learning Seminar, Univ. of Oxford — March 23, 2018
- Probability Seminar, University of British Columbia — January 12, 2017
- Probability Seminar, University of Wisconsin, Madison — January 15, 2015
- Theory Lunch, Microsoft Research, Redmond — August 27, 2014

How fragile are information cascades?

- Statistical Physics Holiday Seminar, Eötvös University (ELTE), Budapest December 29, 2017
- Probability Seminar, University of Pennsylvania — November 14, 2017
- Theory Lunch, Microsoft Research, Redmond — April 19, 2017

Finding and hiding the seed

- Dynamic Networks Workshop, Isaac Newton Institute, Cambridge, UK — December 16, 2016
- Probability Seminar, Princeton University — November 30, 2016

Controlled diffusion on graphs

- Probability Seminar, University of Washington — November 21, 2016

Sequence assembly from corrupted shotgun reads

- MSR Theory Day, Microsoft Research, Redmond — March 10, 2016

Braess's paradox for the spectral gap in random graphs and delocalization of eigenvectors

- Probability Seminar, University of Colorado, Boulder — April 20, 2017
- Probability Seminar, University of Minnesota — February 12, 2016
- Theory Lunch, UC Berkeley — January 27, 2016
- Random Matrix Seminar, Princeton University — November 23, 2015
- Theory Lunch, Microsoft Research, Redmond — July 29, 2015

From trees to seeds: on the inference of the seed from large random trees

- Probability Seminar, Duke University — October 13, 2016
- BIRS Retreat for Young Researchers in Stochastics, Banff — September 25, 2016
- Theory Seminar, University of Washington — October 13, 2015
- Probability Seminar, University of Bristol — March 27, 2015
- Probability Seminar, UC San Diego — January 22, 2015
- SILO Seminar, University of Wisconsin, Madison — January 14, 2015
- Probability Seminar, Stanford University — January 12, 2015
- Probability Seminar, BUTE, Budapest — January 6, 2015
- Probability Seminar, UC Berkeley — October 22, 2014

Multidimensional sticky Brownian motions as limits of exclusion processes

- Monash Workshop on Self-interacting Processes — September 7, 2016
- Probability Seminar, University of Wisconsin, Madison — November 14, 2013

Coexistence in preferential attachment networks

- Risk Management Seminar, UC Berkeley — April 15, 2014
- Theory Lunch, Microsoft Research, Redmond — June 5, 2013
- Probability Seminar, UCLA — May 15, 2013
- Probability Seminar, UC Berkeley — March 13, 2013

Election manipulation: the average-case

- EconCS Seminar, UC Berkeley — April 9, 2013
- Probability Seminar, BUTE, Budapest — January 4, 2012
- Combinatorial Stochastic Processes Seminar, UC Berkeley — October 14, 2011

Modeling Flocks and Prices: Jumping Particles with an Attractive Interaction

- Mathematical Physics & Probability Seminar, UC Davis — November 14, 2012
- Statistical Physics Seminar, Eötvös University (ELTE), Budapest — April 15, 2009

Organizing

Apr 2025 **Workshop on Detection, Estimation, and Reconstruction in Networks**, *Simons Laufer Mathematical Sciences Institute (SLMath/MSRI)*, Berkeley, CA.
Part of the SLMath/MSRI thematic program on Probability and Statistics of Discrete Structures. Lead organizer; co-organizing with Po-Ling Loh, Gábor Lugosi, Sofia Olhede, and Roberto I. Oliveira.

Apr 2024 **Workshop on Learning in Networks: Discovering Hidden Structure**, *Institute for Data, Econometrics, Algorithms, and Learning (IDEAL)*, Evanston, IL.
Part of the IDEAL Institute special thematic program on Networks and Inference (see below). Co-organized with S. Bandari, J. Gaudio, V. Jain, M. Michelen, L. Orecchia, L. Shan, and E. Zheleva.

Winter & Spring 2024 **IDEAL Special Program on Networks and Inference**, *Institute for Data, Econometrics, Algorithms, and Learning (IDEAL)*, Chicagoland, IL.
Co-organized with colleagues at Northwestern University, TTIC, U. of Chicago, and UIC.

2023 — 2024 **Northwestern Statistics & Data Science Seminar**, Evanston, IL.
Organizer.

2017 — 2022 **Princeton Probability Seminar**, Princeton, NJ.
Co-organized with Evita Nestoridi, Misha Shkolnikov, Allan Sly, and Ramon van Handel.

2019 — 2022 **Wilks Memorial Seminar in Statistics**, Princeton, NJ.
Co-organized with M. Cattaneo, J. Fan, B. Hanin, J. Klusowski, S. Kulkarni, and E. Rebrova.

2019 — 2022 **Columbia - Princeton Probability Day**, New York, NY / Princeton, NJ.
Co-organized this annual one-day conference with colleagues at Columbia and Princeton. Lead organizer of the 2019 edition in Princeton.

Oct 2021 **Princeton Day(s) of Statistics**, Princeton, NJ.
Co-organized this two-day conference with M. Cattaneo, J. Fan, B. Hanin, J. Klusowski, S. Kulkarni, and E. Rebrova.

2018 — 2020 **Princeton ORFE Colloquium**, Princeton, NJ.
Organizer.

Nov 2016 **Northwest Probability Seminar 2016**, Redmond, WA.
Co-organized this one-day conference with A. Holroyd and Y. Peres.

Editorial Work and Reviewing

I serve as a **Senior Associate Editor** for:

- ACM Transactions on Probabilistic Machine Learning, 2023 – present

I have served on the **Program Committee** of the following conferences/workshops:

- Conference on Learning Theory (COLT) 2024
- SIAM Workshop on Network Science 2018 (NS18)

I have served as a **Reviewer** for the following journals:

- Annals of Applied Probability
- Annals of Statistics
- Bernoulli Journal
- Combinatorics, Probability, and Computing
- Electronic Communications in Probability
- Electronic Journal of Probability
- Experimental Mathematics
- IEEE Transactions on Information Theory
- IEEE Transactions on Network Science and Engineering
- Information and Inference: A Journal of the IMA
- Involve, a Journal of Mathematics
- Journal of Applied Probability
- Journal of Machine Learning Research
- Journal of the Royal Statistical Society: Series B
- Journal of Statistical Physics
- Mathematical Statistics and Learning
- Mathematics of Operations Research
- Memoirs of the AMS
- Nature Communications
- Probability Theory and Related Fields
- Random Structures & Algorithms
- Science
- SIAM Journal on Discrete Mathematics
- SIAM Journal on Mathematics of Data Science
- Stochastic Processes and their Applications
- Theoretical Population Biology
- Theory of Computing
- Transactions on Economics and Computation

I have served as a **Reviewer** for the following conferences:

- COLT 2016, 2018, 2019
- DNA 26
- FOCS 2021, 2023
- ISIT 2017, 2020, 2023
- ITCS 2019, 2021, 2024
- NeurIPS 2016, 2017
- RANDOM 2017, 2018, 2020
- SODA 2017, 2018, 2020, 2024, 2025
- STOC 2016, 2019, 2020

I have served as an **External Reviewer** for:

- Banff International Research Station (BIRS) Workshop proposals

Further Leadership and Service

To the profession

Fall 2023 **Tutorial Committee**, *Scientific Committee of the Seminar on Stochastic Processes 2024*.

Aug 2023 **Panelist**, *Academic Panel about careers in academia*, Research in Industrial Projects for Students (RIPS) Celebration 2023, IPAM, UCLA.

At Northwestern University

2024 — present **Executive Committee**, *Institute for Data, Econometrics, Algorithms, and Learning (IDEAL)*, Northwestern University.
I serve on the Education Committee of the IDEAL Institute's Executive Committee.

2024 — 2025, Spring 2023 **PhD Admissions Committee**, *Department of Statistics and Data Science*, Northwestern University.

2024—2025 **PhD Admissions Committee**, *Department of Computer Science*, Northwestern University.

2023 — present **Curriculum Committee**, *Department of Computer Science*, Northwestern University.

2023 — 2024 **Graduate Program Enhancement Committee**, *Department of Computer Science*, Northwestern University.

2023 — 2024 **Teaching Assistant and Peer Mentor Awards Committee**, *Department of Computer Science*, Northwestern University.

At Princeton University

2021 — 2022 **Interim Director**, *Certificate Program in Optimization and Quantitative Decision Science (OQDS)*, Princeton University.

2019 — 2022 **Executive Committee Member**, *Certificate Program in Optimization and Quantitative Decision Science (formerly: Engineering and Management Systems)*, Princeton University.

2021 — 2022 **Oversight Group for First-Year EGR Courses**, *School of Engineering and Applied Science (SEAS)*, Princeton University.

2018 — 2020 **Faculty Adviser and Fellow**, *Whitman College*, Princeton University.
I served as a faculty adviser for incoming first year students.

2018 — 2022 **Faculty Adviser**, *ORFE Classes of 2021 and 2024*, Princeton University.

Fall 2022 **Committee on Departmental Learning Goals and Assessment Plans**, *ORFE Department*, Princeton University.

2017 — 2021 **Graduate Admissions Committee**, *ORFE Department*, Princeton University.

2020 — 2021 **Undergraduate Curriculum Committee**, *ORFE Department*, Princeton University.

2018 — 2019 **Departmental Liaison**, *ORFE Department*, Princeton University.
Departmental liaison for the university-wide review of the learning management system Blackboard.

Oct 2018 **Panelist**, *ORFE Job Market Panel*, Princeton University.

At Microsoft Research

March 2016 **Berkeley Statistics Annual Research Symposium (BSTARS)**, UC Berkeley.
I represented Microsoft Research at the annual Industry Alliance event of the Berkeley Statistics Department, where I also gave a short talk illustrating research efforts at Microsoft.

At UC Berkeley

2014 — 2015 **Head of Student Hospitality Committee**, *Department of Statistics*, UC Berkeley.
I coordinated the lunches between the departmental seminar speaker and graduate students.

2013 — 2014 **Graduate Admissions Committee**, *Department of Statistics*, UC Berkeley.
I reviewed 100+ applications to the Statistics PhD program.

2012 — 2013 **Co-President, Statistics Graduate Student Association (SGSA)**, UC Berkeley.
I co-led (with Po-Ling Loh) a team of a dozen student officers who worked on improving graduate student life in the department. We designed and conducted a survey to assess student opinions. We worked closely with faculty who founded the Industry Alliance Program, which in turn greatly benefited graduate students. For instance, based on our suggestions, from the following year onwards, Graduate Student Instructors received an increased stipend, equal to that of Graduate Student Researchers. We also revamped communications between students and the department, e.g., by resurrecting the student newsletter.

2010 — 2014 **Student Seminar Committee**, *Department of Statistics*, UC Berkeley.
Co-organized the bi-weekly statistics student seminars.

Outreach and related activities

Math Circles

2023 — 2024 **Math Circles of Chicago**, Chicago, IL.
I volunteered as a mathematics teacher and held problem-solving sessions for talented middle school and high school students.

2011 — 2015 **Berkeley Math Circle**, Berkeley, CA.
I volunteered as a mathematics teacher and held problem-solving sessions for talented youth at the elementary, middle, and high school level. I designed several problem sets, with topics including probability games and graph theory.

Spring 2014 **Stanford Math Circle**, Stanford, CA.
I volunteered as a mathematics teacher and held problem-solving sessions for talented middle school students. The sessions were on probability games, based on problem sets that I designed.

Math Festivals

Dec 2023 **QED Math Symposium**, Chicago, IL.
I volunteered as a judge at this math symposium for middle and high school students, where students present their original math research.

May 2023 **Julia Robinson Math Festival**, Chicago, IL.
I volunteered and led a table at this math festival for elementary and middle school students, where students can become excited about math through fun activities.

Springs 2008–2010 **Medve Vetélkedő**, Budapest, Hungary.
I volunteered at this fun math competition for K-12 students. This is an outdoors team competition, taking place at Gellért hill in Budapest on a sunny Saturday each spring, where teams of three students go from base to base solving fun mathematical puzzles.

Expository Talks

Oct 2024 **IDEAL Get Ready for Research Workshop**, UIC, Chicago, IL.
I will give an overview talk on graph matching, aimed at 1st and 2nd year undergraduates who are interested in getting involved in research.

June 2023 **IDEAL Get Ready for Research Workshop**, UIC, Chicago, IL.
I gave an overview talk on "Learning in Networks", aimed at 1st and 2nd year undergraduates who are interested in getting involved in research.

May 2023 **Northwestern Undergraduate Math Society**, Evanston, IL.
I gave an expository talk on the trace reconstruction problem.

April 2021 **Princeton University Math Club**, Princeton, NJ.
I gave an expository talk on the trace reconstruction problem.