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<b>Current positions</b>	<p>CARNEGIE MELLON UNIVERSITY, Pittsburgh, Pennsylvania          Professor of Mathematics, 2020–present; Assoc. 2015–2020; Asst. 2010–2015</p> <p>MATHEMATICAL ASSOCIATION OF AMERICA, Washington, D.C.          National Coach, USA International Math Olympiad Team, 2013–present          Assistant (2002, 2003); Instructor (2008, 2009); Deputy Leader (2004, 2010–2013)</p> <p>EXPII, INC. (producer of NOVID app), Pittsburgh, Pennsylvania          Founder and CEO, 2014–present</p>
<b>Previous positions</b>	<p>MICROSOFT RESEARCH, Seattle, Washington          Research Intern, Summer 2009</p> <p>THE D.E. SHAW GROUP, New York, New York          Quantitative Analyst Intern, Summers 2005 and 2007</p>
<b>Education</b>	<p>PRINCETON UNIVERSITY, Princeton, New Jersey          Ph.D., Mathematics, 2010</p> <p>CAMBRIDGE UNIVERSITY, Cambridge, United Kingdom          Master of Advanced Study in Mathematics with Distinction, 2005</p> <p>CALIFORNIA INSTITUTE OF TECHNOLOGY, Pasadena, California          Bachelor of Science with Honor, Mathematics, 2004; GPA 4.3/4.3, class rank 1</p>
<b>Awards, fellowships, and grants</b>	<p>United States Presidential Early Career Award for Scientists and Engineers (2019)          Coach, 4-time winning Int'l Math Olymp team ('15, '16, '18, '19); last USA win '94          Ryan Award for Meritorious Teaching (typically one per year), CMU (2019)          Nat'l Sci. Fndn. CAREER Grant DMS-1455125, Extremal Combinatorics ('15–'20)          E-Learning Bronze Award (ExpII), 2016 QS Reimagine Education Awards          Finalist (ExpII), 2016 SXSWedu Startup Competition          Pittsburgh 40 under 40, Pittsburgh Magazine (2017)          ExpII grants: Overdeck Family Fndn. and Templeton World Charity Fndn. ('16, '18)          Nat'l Sci. Fndn. Grant DMS-1201380, Extremal Combinatorics (2012–2015)          Coach, CMU Putnam math team rank #2,5,2,5,2,1 (2011–2016); last top-5 in 1987          Nat'l Security Agency Young Investigators Grant (2011–2012)          USA-Israel Binational Science Foundation Grant (2011–2015)          Nat'l Sci. Fndn. Infrastructure Grant for USA Math Olymp. Program ('10–'13)          Fannie and John Hertz Foundation Graduate Fellowship (2005–2010)          Nat'l Sci. Fndn. Graduate Research Fellowship (2006–2009)          Winston Churchill Foundation Scholarship (2004–2005) for study at Cambridge          16th and 18th places, 2002 and 2003 Putnam Mathematical Competitions          7th place team, 2004 Assoc. Comput. Machinery Int'l Colleg. Programming Contest          Silver medal, 1999 Int'l Math Olympiad / 3rd place, 1996 Nat'l MathCounts          Only 1999 Nat'l Olymp. training camp qualifier in 3 subj. (math, comput., chem.)</p>

<b>Patents</b>	<p>E. Lubetzky, Y. Peres, D. Malkhi, P. Loh, Distributed stochastic clustering for automated formation of connected networks of agents, <i>U.S. Patent #9575809</i>, filed Jan. 10, 2012</p> <p>P. Loh, L. Hamilton, R. Li, Adaptive learning system using automatically rated problems and pupils, <i>U.S. Patent #10720072</i>, filed Feb. 17, 2017</p> <p>P. Loh, F. Campos, J. Choi, D. Dijour, B. Huffman, M. Jaffer, B. Wang, P. Wang, Crowdsourced contact tracing, <i>U.S. Provisional Patent Application #63/041,806</i>, filed Jun. 19, 2020</p>
<b>Structural innovations</b>	<p><i>NOVID anonymous contact tracing app (2020–present).</i></p> <p>Led team which created world’s first COVID-19 demonstrably capable of measuring distances with the requisite accuracy for contact tracing, using new ultrasonic distance measurement techniques. Resulting app “NOVID” was first anonymous contact tracing app published for the USA which did not use any personal information (no GPS, no mobile number, etc). App also introduced alternative paradigm for contact tracing, based on showing healthy people the approach of COVID-19 cases towards them along their physical-interaction network.</p> <p><i>USA Math Olympiad training program (2010–present).</i></p> <p>Shifted primary focus away from near-term training for USA performance on (high school) International Math Olympiad competition itself, towards promotion of long-term success of identified talent through motivation and guidance. Secured new National Science Foundation grant to introduce connections to research and higher math. Globalized scope to invite top foreign students to join USA national training program. Expanded National Coach strategy to mathematically inspire wide base of students through public outreach. Even with focus shift from near-term training to long-term talent cultivation, USA math team ranked #2, #1, #1, #3, #1, and #1 in six years as National Coach, ending 20-year gap in first-place finishes.</p> <p><i>Carnegie Mellon University (2010–present).</i></p> <p>While coach, CMU math team had six consecutive top-5 rankings in Putnam competition, breaking 20-year gap in top-5 finishes and setting university records (#2 followed by #1). For each of past 8 years, CMU also had 2nd-most students individually ranked in top-500 among all universities, representing 6-fold increase over historical average. Achieved this by co-leading creation and management of undergraduate focused ultra-honors program, mentoring student talent, and matching students with advanced education and research opportunities.</p>
<b>Research focus</b>	<p>Advance theoretical understanding of combinatorics, probability, and algorithms, while practically implementing, commercializing, and scaling real-world applications</p>
<b>Selected publications (out of 40)</b>	<p>M. Lavrov, P. Loh, and A. Messegué, Distance-Uniform Graphs with Large Diameter, <i>SIAM Journal on Discrete Mathematics</i> <b>33</b> (2019) 994–1005.</p> <p>P. Loh and J. Ma, Diameter critical graphs, <i>Journal of Combinatorial Theory Series B</i> <b>117</b> (2016), 34–58</p>

M. Lavrov and P. Loh, Hamiltonian increasing paths in random edge orderings, *Random Structures and Algorithms* **48** (2016), 588–611

J. Fox, P. Loh, and Y. Zhao, The critical window for the classical Ramsey-Turán problem, *Combinatorica* **35** (2015), 435–476

P. Loh and E. Lubetzky, Stochastic coalescence in logarithmic time, *Annals of Applied Probability* **23** (2013), 492–528

**Selected  
research talks  
(out of 115)**

Society of Industrial and Applied Mathematics Annual Meeting, American Math Society Invited Presentation, *Connections in Extremal Combinatorics: Ramsey Theory* (2017)

Stanford Mathematics Department Colloquium, *Directed paths: from Ramsey to Ruzsa and Szemerédi* (2016)

National Institutes of Health Frontiers in Data Science Lecture Series (talk joint with National Science Foundation), *World-Scale Personalized Learning through Crowdsourcing and Algorithms* (2016)

International Congress of Mathematicians 2014 Satellite Conference on Extremal and Structural Graph Theory (Gyeongju, Korea), *Diameter critical graphs* (2014)

Association for Computing Machinery — Society for Industrial and Applied Mathematics Symposium on Discrete Algorithms (Kyoto, Japan), *Stochastic coalescence in logarithmic time* (2012)

**Select media  
coverage**

Simpler way to solve Quadratic Equations was covered in *The New York Times*, *Popular Mechanics*, *MIT Technology Review*, others.

[nyti.ms/3jbBlGv](https://www.nytimes.com/2015/03/08/science/math/a30152083) [popularmechanics.com/science/math/a30152083](http://popularmechanics.com/science/math/a30152083)

Contributed problems / puzzles published in *The New York Times* “Numberplay,” in *FiveThirtyEight* “Riddler,” and in *The Wall Street Journal* “Varsity Math”

[nyti.ms/30gvDdL](https://www.nytimes.com/2015/03/08/science/math/a30152083) [nyti.ms/2k01LMk](https://www.fortythree.com/riddler/2015/03/08/numberplay/) [nyti.ms/2k4n9md](https://www.fortythree.com/riddler/2015/03/08/numberplay/) [nyti.ms/2k4AivB](https://www.fortythree.com/riddler/2015/03/08/numberplay/)  
[nyti.ms/2k5n01W](https://www.fortythree.com/riddler/2015/03/08/numberplay/)

[53eig.ht/21lCTwA](https://www.fortythree.com/riddler/2015/03/08/numberplay/) [53eig.ht/2aMQR7j](https://www.fortythree.com/riddler/2015/03/08/numberplay/) [53eig.ht/2ijv1LM](https://www.fortythree.com/riddler/2015/03/08/numberplay/) [on.wsj.com/1Q4czFi](https://www.fortythree.com/riddler/2015/03/08/numberplay/)

Promoted math through interviews with international press after USA team won International Math Olympiad in 2015 and 2016. Featured on *CBS Weekend News*, quoted in *Washington Post*, *NPR*, *The Atlantic*, *China Newsweek*, etc. Selected:

[cbsnews.com/news/americas-best-young-math-minds-compete-in-rio](http://www.cbsnews.com/news/americas-best-young-math-minds-compete-in-rio)  
[wpo.st/EMFZ2](http://www.washingtonpost.com/local/education/2015/07/25/math-olympiad-usa-team-wins/) [wpo.st/ZJzZ2](http://www.washingtonpost.com/local/education/2015/07/25/math-olympiad-usa-team-wins/) [n.pr/1TIURr3](http://www.npr.org/2015/07/25/426855111/math-olympiad-usa-team-wins/) [53eig.ht/2bSSfbu](https://www.fortythree.com/riddler/2015/03/08/numberplay/)

[theatlantic.com/magazine/archive/2016/03/the-math-revolution/426855](http://www.theatlantic.com/magazine/archive/2016/03/the-math-revolution/426855)

[lat.ms/1fE20y0](http://www.latimes.com/education/la-ea-1e20y0-math-olympiad-20150725-story.html) [str.sg/Ze6V](http://www.str.sg/Ze6V) [news.inewsweek.cn/detail-2135.html](http://news.inewsweek.cn/detail-2135.html)

Featured in or co-created YouTube videos totaling over 9 million views, including the 2nd most popular in Carnegie Mellon University channel. [youtu.be/IUTGFQpKaPU](https://www.youtube.com/channel/UCIUTGFQpKaPU)

**Selected  
general talks  
(out of 426)**

Estimated total yearly in-person audiences reached: 2019 (15,000 people through 99 talks), 2018 (15,000 people through 87 talks), 2017 (8,000 people through 66 talks), 2016 (4,000 people through 60 talks)

Commencement Keynote, Duquesne University School of Education, *The Future of Education* (2018)

National Museum of Mathematics (New York), Math Encounters Public Lecture, *Massive Numbers, from the International Mathematical Olympiad* (2015)

Commencement Keynote, Chinese International School (Hong Kong), *Mathematics and Impact* (2017)

Bangladesh Mathematical Olympiad (Dhaka, Bangladesh), public lecture for math students and entrepreneurs, *Math and Creativity; Entrepreneurship* (2016)

SXSWedu Conference & Festival (Austin), Launch Startup Competition Finalist Pitch, *Personal Learning* (2016)

**Advisory /  
committees**

Association for Women in Mathematics Advisory Board (2016–present)

Fannie and John Hertz Foundation Fellowship Interviewer (2016–present)

New York Academy of Sciences Global STEM Alliance, STEM Education Framework Advisory Board (2016–present)

Mathematical Association of America Second Century Campaign Steering Committee (2015–2016)