

AI to Assist Mathematical Reasoning: A Workshop

Committee

Petros Koumoutsakos

Chair

Petros Koumoutsakos is Herbert S. Winokur Professor of Engineering and Applied Sciences and Area Chair of Applied Mathematics at Harvard John A. Paulson School of Engineering and Applied Sciences (SEAS). He studied Naval Architecture (Diploma-NTU of Athens, M.Eng.-U. of Michigan), Aeronautics and Applied Mathematics (PhD-Caltech). He has conducted post-doctoral studies at the Center for Parallel Computing at Caltech and at the Center for Turbulent Research at Stanford University and NASA Ames. He has served as the Chair of Computational Science at ETHZ Zurich (1997-2020) and has held visiting fellow positions at Caltech, the University of Tokyo, MIT, the Radcliffe Institute of Advanced Study at Harvard University and he is Distinguished Affiliated Professor at TU Munich. Petros is elected Fellow of the American Society of Mechanical Engineers (ASME), the American Physical Society (APS), the Society of Industrial and Applied Mathematics (SIAM) and the Collegium Helveticum. He is recipient of the Advanced Investigator Award by the European Research Council and the ACM Gordon Bell prize in Supercomputing. He is elected International Member to the US National Academy of Engineering (NAE).

Jordan Ellenberg

Member

Jordan Ellenberg is the John D. MacArthur Professor of Mathematics at the University of Wisconsin-Madison. His research centers on number theory and arithmetic geometry. He is a Discovery Fellow at the Wisconsin Institute for Discovery, where he is part of the Machine Learning group and the Institute for Foundations of Data Science. He is a member of the Science Board of IPAM. Ellenberg has been writing for a general audience about math for more than fifteen years; his work has appeared in the New York Times, the Wall Street Journal, the Washington Post, Wired, The Believer, and the Boston Globe, and he is the author of the “Do the Math” column in Slate. His Wired feature story on compressed sensing appeared in the Best Writing on Mathematics 2011 anthology. His novel, The Grasshopper King, was a finalist for the 2004 New York Public Library Young Lions Fiction Award. His 2014 book How Not To Be Wrong was a New York Times and Sunday Times (London) bestseller.

Melvin Greer

Member

Melvin Greer is Chief Data Scientist, Americas, Intel Corporation. Dr. Greer is a technical expert in the application of advanced mathematics, artificial intelligence, machine learning, blockchain zero trust models and neuromorphic computing. His systems and software engineering experience has resulted in patented inventions in Cloud Computing, Synthetic Biology, and IoT Bio-sensors for edge analytics. He has authored 5 books and published over 400 research papers. His research has been cited more than 4000 times worldwide. Dr. Greer is a member of the American Association for the Advancement of Science (AAAS) and serves on the Board of Directors for the U.S. National Academy of Science, Engineering and Medicine. Dr. Greer has been appointed to Senior Advisor and Fellow at the FBI IT and Data Division, where he accelerates the FBI mission via data analytics and advanced data science techniques. Dr. Greer has been recognized by LinkedIn as a Top 10 Voice in data science and analytics. He is the recipient of the BDPA Lifetime Achievement Award. He also received the Washington Exec inaugural Pinnacle Award as Artificial Intelligence Executive of the Year. He has been awarded the BEYA Technologist of the Year Award and has been inducted into the 2023 BEYA Hall of Fame which recognize his outstanding technical contributions. Dr. Greer also is Adjunct Faculty, Advanced Academic Program at Johns Hopkins University, where he teaches the Master of Science Course "Practical Applications of Artificial Intelligence". He has also been appointed Senior Advisor at the UC Berkeley, Goldman School of Public Policy where he develops and accelerates the adoption of public policy for emerging and advanced technologies.

Brendan Hassett

Member

Brendan Hassett joined the Brown faculty in 2015 as a Professor of Mathematics. He assumed the directorship of ICERM in July 2016. Brendan's research focus is algebraic geometry - the study of geometric objects defined as solutions to polynomial equations. Brendan has written 70 research papers and has authored or co-edited eight books. He was the chair of the mathematics department at Rice from 2009 to 2014. His work has been recognized with a Sloan Research Fellowship, a National Science Foundation CAREER award, and the Charles W. Duncan Award for Outstanding Faculty at Rice. He is a Fellow of the American Mathematical Society and the American Association for the Advancement of Science. Brendan received his Ph.D. from Harvard in 1996 and then spent four years at the University of Chicago as a Dickson Instructor and NSF postdoctoral fellow.

Yann A. LeCun

Member

Yann LeCun is VP & Chief AI Scientist at Meta and Silver Professor at NYU affiliated with the Courant Institute of Mathematical Sciences & the Center for Data Science. He was the founding Director of FAIR and of the NYU Center for Data Science. He received an Engineering Diploma from ESIEE (Paris) and a PhD from Sorbonne Université. After a postdoc in Toronto he joined AT&T Bell Labs in 1988, and AT&T Labs in 1996 as Head of Image Processing Research. He joined NYU as a professor in 2003 and Meta/Facebook in 2013. His interests include AI, machine learning, computer perception, robotics, and computational neuroscience. He is the recipient of the 2018 ACM Turing Award (with Geoffrey Hinton and Yoshua Bengio) for "conceptual and engineering breakthroughs that have made deep neural networks a critical component of computing", a member of the National Academy of Sciences, the National Academy of Engineering, the French Académie des Sciences.

Heather Macbeth

Member

Heather Macbeth is an Assistant Professor of Mathematics at Fordham University. She was previously a postdoc at MIT and at the ENS (Paris). She is a pure mathematician, specializing in the partial differential equations arising in differential geometry. Since 2020 she has also worked on the formalization of these subjects in interactive proof assistants. Dr. Macbeth holds a Ph.D. in mathematics from Princeton and a B.Sc. (Hons) in mathematics from the University of Auckland.

Talia Ringer

Member

Talia Ringer is an Assistant Professor at the University of Illinois Urbana-Champaign. Their main interest is in making program verification using interactive theorem provers more accessible through better proof engineering tools and practices, especially when it comes to maintaining proofs as programs change over time. Their vision is a future of verification that is accessible to all programmers, not just to experts. They got their Ph.D. from University of Washington in June 2021, where they were an NSF GRFP fellow. Prior to graduate school, they earned their bachelor's in mathematics and computer science from University of Maryland, then worked at Amazon as a software engineer for three years. They recently visited Google AI working on machine learning for formal proof. They are the founder and previous chair of the SIGPLAN-M international long-term mentoring program, the founder and president of the Computing Connections Fellowship, and a contributor to the Coq interactive theorem prover.

Kavitha Srinivas

Member

Kavitha Srinivas is currently a senior research scientist at IBM Research, worked in the past as a CTO and co-founder of RivetLabs, 20+ years in research (2001-2023). She has worked extensively in the areas of semantic web, ontology reasoning, graph databases and more recently, code generation for automated machine learning. She has received several outstanding technical achievements awards at Research, is published in major conferences such as SIGMOD, AAAI, IJCAI, VLDB, ISWC, and been on organizational committees and program committees of conferences such as EDBT, IJCAI, WWW, etc. She was trained as a cognitive psychologist, and left the field as an Associate Professor at Boston College to switch fields.

Terence C. Tao

Member

Terence Tao is a professor of mathematics at the University of California, Los Angeles, where he has taught since 1996. He has authored and contributed to several books, and his numerous articles have appeared in such publications as the Annals of Mathematics, Acta Mathematica, and the American Journal of Mathematics. He is currently a member of the President's Council of Advisors on Science and Technology. He received the Fields Medal in 2006 and is a member of the NAS. He received an M.Sc. (1992) from Flinders University of South Australia and a Ph.D. (1996) from Princeton University. His areas of research include harmonic analysis, number theory, and combinatorics.

Michelle Schwalbe

Staff Officer