Economic, Legal, and Regulatory Implications of Emerging Technologies: A Workshop Series

Committee

Ajay Agrawal

Co-Chair

Ajay Agrawal is the Geoffrey Taber Chair in Entrepreneurship and Innovation and Professor of Entrepreneurship at the University of Toronto's Rotman School of Management and a research associate at the National Bureau of Economic Research in Cambridge, MA.

Dr. Agrawal conducts research on the economics of artificial intelligence, science policy, entrepreneurial finance, and geography of innovation. He is co-founder of NextAI, an accelerator and founder development program for early- or idea- stage AI-enabled startups; founder of the Creative Destruction Lab, a seed-stage program for science-based companies; and co-founder of an annual conference on the business of artificial intelligence, held at the University of Toronto. He is a co-author of the book, Prediction Machines: The Simple Economics of Artificial Intelligence (2018), and co-editor of The Economics of Artificial Intelligence: An Agenda, forthcoming from the University of Chicago Press.

Dr. Agrawal has presented this work at a variety of institutions, including Harvard, MIT, Stanford, London Business School, Wharton, London School of Economics, Carnegie Mellon, Berkeley, The Brookings Institution, the National Press Club in Washington, the World Intellectual Property Organization in Geneva, Industry Canada, and the Federal Reserve Bank, among others. He advises firms and governments in fields related to innovation and strategy and has testified as an expert witness on related topics.

Dr. Agrawal received his Ph.D. in strategy and economics from the University of British Columbia, Vancouver, in 2000.

Angela McLean

Co-Chair

Angela McLean is Professor of Mathematical Biology at the University of Oxford and co-director of the Oxford University Martin School Programme on Collective Responsibility for Infectious Diseases.

Dr. McLean's research focuses on the use of mathematical models to aid in the understanding of the evolution and spread of infectious agents. This encompasses modelling of the dynamics of infections and immune responses within individual hosts as well as models of the spread of infections from one host to another. She produced the first mathematical models that demonstrated the evolution of vaccine-resistant pathogens.

Her contributions also extend to modelling the human immune system where, in particular, she showed the importance of understanding the make-up and dynamics of the immune cell population. This led to an expansion of the field of theoretical immunology and an increase in its influence on experimental work.

An additional interest of Dr. McLean is in the use of natural science evidence in formulating public policy. In pursuit of this, she co-developed the Oxford Martin School Restatements, which list relevant scientific evidence in areas where policy making is controversial.

Dr. McLean has served in an advisory capacity to the government of the United Kingdom, chairing the lead expert group for a policy futures project on reducing the risk of future disasters, including disease pandemics. She was also a member of the UK Department for Environment, Food and Rural Affairs' Science Advisory Council, focusing on the department's use of scientific risk appraisal, and also served on the UK Department of Health's National Expert Panel on New and Emerging Infections.

Angela McLean is Senior Research Fellow of All Souls College, Oxford University, and a fellow of the Royal Society.

Dr. McLean received her Ph.D. in biomathematics from Imperial College, London.

Peter Dayan

Member

Peter Dayan is a director at the Max Planck Institute for Biological Cybernetics. Until September 2018 he was Professor of Computational Neuroscience in the Gatsby Computational Neuroscience Unit at University College London. He helped found the Gatsby Computational Neuroscience Unit in 1998 after serving three years as an assistant professor at MIT and completing postdoctoral research positions at the Salk Institute and the University of Toronto. He won the Rumelhart Prize in 2012 and shared the Brain Prize in 2017.

His interests centre on mathematical and computational models of neural processing, with a particular emphasis on representation, learning, and decision making. He collaborates closely with a wide range of experimentalists, integrating modelling into the design and analysis of empirical investigations involving behavioral, neuroimaging, neuropharmacological, neurophysiological, and optogenetic methods.

Dr. Dayan's recent work has concentrated on the multifarious mechanisms by which humans and other animals approximately maximize reward and minimize punishment. The systems involved apparently recapitulate algorithms popular in artificial intelligence; this connection offers a route for understanding their normal behavior and their characteristic dysfunctions in neurological and psychiatric disease.

Dr. Dayan is the author or co-author of some 318 publications in the research literature and is a fellow of the Royal Society.

Dr. Dayan received a Ph.D. in computational neuroscience from the University of Edinburgh.

Edward W. Felten

Member

Edward W. Felten is the Robert E. Kahn Professor of Computer Science and Public Affairs and the founding director of Princeton's Center for Information Technology Policy, a cross-disciplinary effort studying digital technologies in public life.

From 2011 to 2012 Dr. Felten served as the first chief technologist for the Federal Trade Commission. His research interests include computer security and privacy, especially relating to media and consumer products; and technology law and policy. He has published about 80 papers in the research literature and two books. His research on topics such as web security, copyright and copy protection, and electronic voting has been covered extensively in the popular press.

Professor Felten is a member of the National Academy of Engineering and of the American Academy of Arts and Sciences and is a fellow of the Association for Computing Machinery. He has testified at House and Senate committee hearings on privacy, electronic voting, and digital television. In 2004, Scientific American magazine named him to its list of 50 worldwide science and technology leaders. He served on National Academies' committees on "Study on Directions for the AFOSR Mathematics and Space Sciences Directorate Related to Information Science and Technology" and "Fundamentals of Computer Science--Challenges and Opportunities."

Dr. Felten received his Ph.D. in computer science and engineering from the University of Washington in 1993.

Robin Grimes

Member

Robin Grimes is Professor of Materials Physics at Imperial College London.

Dr. Grimes' primary research interest is the application and development of computer simulation techniques to predict structural and dynamic properties of inorganic materials. He has used computer modelling to predict the structural and dynamic behavior of ceramics, metals, and semiconductors for energy applications. This has allowed him to identify ways in which atomic scale defects modify materials properties. He has investigated a wide range of properties, including thermal conductivity and how materials deform and how atoms are transported through solids. While best known for modelling nuclear materials, he has worked as much on electrochemical systems, optical, and electronic materials.

Prior to joining Imperial College, Dr. Grimes was assistant director of the Davy Faraday Research Laboratory at the Royal Institution, and he spent the year 2000 at Los Alamos National Laboratory as Bernd T. Matthias Scholar.

Dr. Grimes served as chief scientific adviser to the UK Foreign Office from 2013 to 2018. In that position he mainstreamed science as a tool in the UK's diplomatic tool box, using science evidence and science networks to place science collaboration at the heart of key international relationships. He maintains a leading role in the nuclear energy academic community as Ministry of Defence Chief Scientific Advisor on nuclear science and technology matters since 2017.

Dr. Grimes has authored over 300 peer-reviewed publications and is currently a member of the editorial board for the Journal of Materials Science. He is a fellow of the Royal Academy of Engineering and of the Royal Society.

Dr. Grimes received a Ph.D. in material sciences from Keele University in 1988.

Gillian Hadfield

Member

Gillian Hadfield is Professor of Law and Professor of Strategic Management at the University of Toronto and a faculty affiliate at the Center for Human-Compatible AI at the University of California, Berkeley.

Dr. Hadfield ‘s research is focused on innovative design for legal and dispute resolution systems in advanced and developing market economies; governance for artificial intelligence; the markets for law, lawyers, and dispute resolution; and contract law and theory. She teaches Contracts; Problems in Legal Design; Legal Design Lab, and Responsible AI.

Prior to rejoining the University of Toronto in 2018, Professor Hadfield was the Richard L. and Antoinette Schamoi Kirtland Professor of Law and Professor of Economics at the University of Southern California from 2001 to 2018. She began her teaching career at the University of California at Berkeley and was previously on the University of Toronto Faculty of Law from 1995 to 2000. Her book, Rules for a Flat World: Why Humans Invented Law and How to Reinvent It for a Complex Global Economy, was published by Oxford University Press in 2017.

Dr. Hadfield is a member of the World Economic Forum’s Future Council for Agile Governance and co-curates their Tranformation Map for Justice and Legal Infrastructure; she previously served on the Forum’s Future Council for Technology, Values, and Policy and Global Agenda Council for Justice. She is currently a member of the American Bar Association’s Commission on the Future of Legal Education and on the Dubai Courts of the Future Forum. She is a senior policy advisor for OpenAI in San Francisco and an advisor to courts and several organizations and technology companies engaged in innovating new ways to make law and policy smarter, more accessible, and more responsive to technology and artificial intelligence including the Hague Institute for the Innovation of Law, the National Center for State Courts, LegalZoom, Responsive Law, Sagewise (building a digital jurisdiction for blockchain technology and smart contracts), and RhubarbFund (developing a blockchain-based system for online dispute resolution.)

Dr. Hadfield received a Ph.D. in economics and J.D. from Stanford University.

Fei-Fei Li

Member

Fei-Fei Li is Professor of Computer Science at Stanford University, co-director of the Stanford Vision and Learning Lab, director of the Stanford Artificial Intelligence Lab, and artificial intelligence/machine learning advisor for Google Cloud.

Dr. Li's research focuses on computer vision, cognitive neuroscience, computational neuroscience, and Big Data analysis, working with others to "build smart algorithms that enable computers and robots to see and think, as well as to conduct cognitive and neuroimaging experiments to discover how brains see and think." She has authored more than 100 scientific articles and is the recipient of the 2014 IBM Faculty Fellow Award, the 2011 Alfred Sloan Faculty Award, the 2012 Yahoo Labs FREP Award, the 2009 NSF CAREER Award, and the 2006 Microsoft Research New Faculty Fellowship. From 2016 to 2018 she served as Google Cloud AI's leader and Chief Scientist. Dr. Li is also co-founder of AI4ALL, a nonprofit working to increase diversity and inclusion in artificial intelligence.

Dr. Li served as a member of the National Academies' committee on "Automating Image and Video Analysis for Fisheries Stock Assessment: A Workshop."

Dr. Li received a Ph.D. in electrical engineering from California Institute of Technology in 2005.

Gilean McVean

Member

Gilean McVean is director of the Big Data Institute at Oxford University.

Dr. McVean uses mathematical, statistical, and computational approaches to learn about fundamental biological and evolutionary processes, particularly recombination, mutation, and natural selection, through the study of genetic variation in natural populations. He developed the first statistical method for estimating fine-scale patterns of recombination rate variation from genome-scale genetic variation data. Application of this method led to the first fine-scale genetic map in humans, helped identify the hotspot-positioning gene PRDM9, and has led to discoveries about how recombination evolves.

He has also played leading roles in efforts to map patterns of genetic variation in humans through the International HapMap Project and the 1000 Genomes Project, made important contributions to theoretical population genetics and the study of mutation, and developed an influential statistical method for imputing classical HLA alleles from SNP data. His work on colored de Bruijn graphs and graph genomes is helping to make possible the study of highly diverse species and genomic regions.

Dr. McVean’s work has been recognized through awards including the 2010 Francis Crick Medal and Lecture and the 2012 Weldon Memorial Prize. He is a fellow of the Royal Society and of the Academy of Medical Sciences.

Dr. McVean received a Ph.D. in genetics from the University of Cambridge in 1998.

Gail Cohen

Staff Officer