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Symposium on Interpretable and Explainable Artificial Intelligence and Machine Learning

June 21st, 1:00 - 4:00 p.m. ET

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1:00 PM[1] **Introduction & Welcome**
Nick Horton and Lance Waller
Chairs for the Committee on Applied and Theoretical Statistics

1:05 PM **Bridging the representation gap between humans and machines as an estimation problem**
Dr. Been Kim (Google Brain)

1:35 PM **Bias and Ethics in Healthcare: It's not AI, it's Us**
Dr. Gari Clifford (Emory University)

2:05 PM **BREAK**

2:20 PM **Cognitive Models as Common Ground between Human and Machines**
Dr. Christian Lebiere (Carnegie Mellon University)

2:50 PM **Machine Learning Transparency in the Legal Context**
Patrick Hall (George Washington University and bnh.ai)

3:20 PM **PANEL: The Landscape for Interpretable and Ethical Machine Learning**
Moderator: Dr. Alyson Wilson (North Carolina State University)

4:00 **ADJOURN**

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[1] All times ET

Speaker and Moderator Biographies

Been Kim, Ph.D

Been Kim is a staff research scientist at Google Brain. Her research focuses on helping humans to communicate with complex machine learning models: not only by building tools (and tools to criticize them) but also studying their nature compared to humans. Been gave keynote at ICLR2022 and ECML 2020 and a talk at the G20 meeting in Argentina in 2019. Her work TCAV received UNESCO Netexplo award, was featured at Google I/O 19' and in a chapter of Brian Christian's book on "The Alignment Problem". She will be serving as Senior Program Chair at ICLR 2023 and was a co-workshop Chair ICLR 2019. She has been a (senior) area chair at NeurIPS, ICML, ICLR, AISTATS and others. She is a steering committee member of FAccT and SaML conferences and a former executive board member and VP of Women in Machine Learning. She received her PhD. from MIT.

Gari Clifford, Ph.D

Gari Clifford is a tenured Professor of Biomedical Informatics and Biomedical Engineering at Emory University and the Georgia Institute of Technology, and the Chair of the Department of Biomedical Informatics (BMI) at Emory. His research applies signal processing and machine learning to medicine to classify, track and predict health and illness. His focus research areas include critical care, digital psychiatry, global health, mHealth, neuroinformatics and perinatal health. He trained in Theoretical Physics, and later in AI at the Universities of Exeter, Southamptom and Oxford in the UK, then spent seven years at MIT as a postdoc and later as a Principal Research Scientist where he managed the creation of the MIMIC II database, the largest open-access critical care database in the world. He later returned to Oxford as an Associate Professor of Biomedical Engineering, where he helped found its Sleep & Circadian Neuroscience Institute and served as Director of the Centre for Doctoral Training in Healthcare Innovation at the Oxford Institute of Biomedical Engineering. Gari is a strong supporter of commercial translation, co-founding and working closely with multiple companies. He is a champion for open-access data and open-source software in medicine, particularly through his leadership of the PhysioNet/CinC Challenges and contributions to the PhysioNet Resource over the last 20 years. He is also committed to developing equitable and sustainable solutions to healthcare problems in resource-poor locations, with much of his work focused in Guatemala.

Christian Lebiere, Ph.D

Christian Lebiere is a Research Faculty in the Psychology Department at Carnegie Mellon University, having received his Ph.D. from the CMU School of Computer Science. During his graduate career, he studied connectionist models and algorithms and was the co-developer of the Cascade-Correlation neural network learning algorithm that

has been used in hundred of practical applications and scientific papers and was a precursor of deep learning algorithms. Since 1991, he has worked on the development of the ACT-R hybrid cognitive architecture and was co-author with John R. Anderson of the 1998 book The Atomic Components of Thought. The ACT-R cognitive architecture is used by a large international community of researchers and has been featured in hundreds of publications in the fields of Cognitive Science and Artificial Intelligence. Most recently, Dr. Lebiere has been involved with John Laird and Paul Rosenbloom in defining the Common Model of Cognition, a community-wide effort to consolidate and formalize the scientific progress resulting from the 40-year research program in cognitive architectures. Dr. Lebiere is a founding member of the Biologically Inspired Cognitive Architectures Society, of the International Conference on Cognitive Modeling, and of the Editorial Board of the Journal of Artificial General Intelligence and the Journal of Biologically Inspired Cognitive Architectures. His work has won the Technion Prediction Tournament and best paper awards at a number of conferences. His research has been supported by NSF, ONR, AFOSR, ARL, NASA, DARPA, IARPA, DMSO, and DTRA and gifts from leading industrial companies such as Nissan and Bosch. His main research interests are cognitive architectures and their applications to psychology, artificial intelligence, human-computer interaction, decision-making, intelligent agents, network science, cognitive robotics and neuromorphic engineering.

Patrick Hall

Patrick Hall is principal scientist at BNH.AI, a D.C.-based law firm where he advises Fortune 500 clients on matters of AI risk and conducts research on AI risk management in support of NIST's efforts on trustworthy AI and technical AI standards. He also serves as visiting faculty in the Department of Decision Sciences at The George Washington School of Business, teaching classes on data ethics and machine learning.

Prior to co-founding BNH, Patrick led H2O.ai’s efforts in responsible AI, resulting in one of the world’s first commercial solutions for explainable and fair machine learning. He also held global customer-facing roles and R&D research roles at SAS Institute. Patrick studied computational chemistry at the University of Illinois before graduating from the Institute for Advanced Analytics at North Carolina State University.

Patrick's technical work has been profiled in Fortune, Wired, InfoWorld, TechCrunch and others. An ardent writer himself, Patrick has contributed pieces to outlets like McKinsey.com, O'Reilly Ideas, Thompson-Reuters Regulatory Intelligence, and he is the lead author for the forthcoming book, Machine Learning for High Risk Applications.

Alyson G. Wilson, Ph.D

Alyson Wilson is the Associate Vice Chancellor for National Security and Special Research Initiatives at North Carolina State University. She is also a professor in the Department of Statistics and principal investigator for the Laboratory for Analytic Sciences. She is a Fellow of the American Statistical Association and the American Association for the Advancement of Science. Her research interests include statistical

reliability, Bayesian methods, and the application of statistics to problems in defense and national security. Prior to joining NC State, she was a research staff member at the IDA Science and Technology Policy Institute (2011-2013); an associate professor in the Department of Statistics at Iowa State University (2008-2011); a technical staff member in the Statistical Sciences Group at Los Alamos National Laboratory (1999-2008); and a senior statistician and operations research analyst with Cowboy Programming Resources (1995-1999). In addition to numerous publications, she has co-authored a book, Bayesian Reliability, and has co-edited two other books, Statistical Methods in Counterterrorism: Game Theory, Modeling, Syndromic Surveillance, and Biometric Authentication and Modern Statistical and Mathematical Methods in Reliability. Dr. Wilson received her Ph.D. in Statistics from Duke University.

Nicholas Horton, Sc.D

Dr. Horton is Beitzel Professor of Technology and Society (Statistics and Data Science) at Amherst College. He teaches courses in statistics, data science, and related fields. He is passionate about improving quantitative and computational literacy for students with a variety of backgrounds and has worked to deepen engagement and mastery of higher-level concepts and data acumen. As an applied biostatistician, Dr. Horton's work is based squarely within the mathematical and computational sciences, but spans other fields in order to ensure that research is conducted on a sound footing. The real-world research problems that these investigators face often require the use of novel solutions and approaches, since existing methodology is sometimes inadequate. Bridging the gap between theory and practice in interdisciplinary settings is often a challenge, and has been a particular focus of Dr. Horton's work in missing data methods and longitudinal regression. He served as the chair of the Committee of Presidents of Statistical Societies, as a member of the Roundtable on Data Science Postsecondary Education, and on the Data Science for Undergraduates consensus study. Dr. Horton has published more than 170 papers in statistics and biomedical research and four books on statistical computing and data science. He has been the recipient of a number of teaching awards and the American Statistical Association Founders Award. Dr. Horton is a fellow of the American Statistical Association and the American Association for the Advancement of Science. He earned his A.B. from Harvard College and his Sc.D. in biostatistics from the Harvard School of Public Health.

Lance Waller, Ph.D

Lance A. Waller is Rollins Professor of the Department of Biostatistics and Bioinformatics in the Rollins School of Public Health at Emory University. He received a Ph.D. in Operations Research from Cornell University in 1992. Dr. Waller's research involves the development of statistical methods to analyze spatial and spatio-temporal patterns. Past research involves the assessment of spatial clustering of disease, linking spatial statistics and geographic information systems, statistical assessments of environmental justice, and hierarchical Bayesian methods for modeling small-area health statistics. Recent areas of interest include spatial point process methods in alcohol epidemiology, conservation biology, and hierarchical models in disease ecology. Dr.

Waller was the recipient of the 2004 Abdel El- Shaarawi Young Researcher's Award. Dr. Waller has served on multiple National Academies committees including the National Research Council Committee on the Review of Existing and Potential Standoff Explosives Detection Techniques, the Institute of Medicine Committee on the Utility of Proximity-based Herbicide Exposure Assessments in Epidemiologic Studies in Vietnam Veterans, the National Academies Committee To Assess Potential Health Effects from Exposures to PAVE PAWS Low-level Phased-array Radiofrequency Energy, and the National Academies Committee on Analysis Of Cancer Risks in Populations Near Nuclear Facilities: Phase 1. In addition, Dr. Waller currently co-chairs the Committee on Applied and Theoretical Statistics.

The Committee on Applied and Theoretical Statistics

The Committee on Applied and Theoretical Statistics (CATS) advises stakeholders in government, academia, industry, and nonprofit organizations on statistics and data science, and their many applications.

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