NATIONAL ACADEMIES Sciences Engineering Medicine

Future Trajectories of Human-AI Collaboration and Teaming
Hosted by: Board on Human-Systems Integration (BOHSI)

As AI systems become more integrated into our daily lives, the nature of human-AI collaboration is evolving rapidly. While current interactions often involve humans directing AI, future Human-AI Teaming (HAT) will require more dynamic, bidirectional partnerships. This webinar series will explore key aspects of HAT, addressing questions related to education, performance optimization, ethics, and trust, while also incorporating foundational theories, methodologies, and system design considerations.

The first webinar will provide an overview of the current state of HAT, examining what it means to work alongside AI teammates and how to prepare individuals for these roles. Where are we now? Where are we headed? This session will lay the groundwork by reviewing key theories and identifying emerging opportunities and challenges in the field. As AI systems transition from passive tools to active collaborators, AI can play various roles—mentor, coach, assistant, or peer—so this session will also examine the cognitive and behavioral implications of these interactions. Key questions to be addressed include:

- What level of autonomy is appropriate?
- What responsibilities should be allocated to AI versus humans?
- How can we design AI teammates that enhance human decision-making and performance?

Understanding these foundational questions is essential to designing effective, ethical, and trustworthy human-AI teams. Join us as we explore the evolving landscape of human-AI teaming and the future of collaboration.

Nancy Cooke is a professor in Human Systems Engineering at the Polytechnic School, one of the Ira A. Fulton Schools of Engineering at Arizona State University. She is also Senior Scientific Advisor for the Global Security Initiative's Center for Human, AI, and Robot Teaming. She received her PhD in Cognitive Psychology from New Mexico State University in 1987. Dr. Cooke is a Past President of the Human Factors and Ergonomics Society and the past chair of the Board on Human Systems Integration at the National Academies of Science, Engineering, and Medicine. Professor Cooke's research interests include the study of individual and team cognition and its application to remotely piloted aircraft systems, human-robot teaming, and emergency response systems. She specializes in the development, application, and evaluation of methodologies to elicit and assess individual and team cognition. Her work is funded by DoD and has been widely published.

Thomas Malone is the Patrick J. McGovern Professor of Management at the MIT Sloan School of Management and the founding director of the MIT Center for Collective Intelligence. At MIT, he is also a Professor of Information Technology and a Professor of Work and Organizational Studies. Previously, he was the founder and director of the MIT Center for Coordination Science and one of the two founding co-directors of the MIT Initiative on "Inventing the Organizations of the 21st Century." His most recent books are Superminds (2018) and The Future of Work (2004), and he is the founding editor of the journal Collective Intelligence and the founding chair of the steering committee for the ACM Collective Intelligence conference series. Professor Malone has published over 100 articles, research papers, and book chapters; he is an inventor with 12 patents, a co-editor of four books, and a cofounder of three software companies. His background also includes work as a research scientist at Xerox Palo Alto Research Center (PARC), a Ph.D. from Stanford University, an honorary doctorate from the University of Zurich, and other degrees in applied mathematics, engineering, and psychology.

Nathan McNeese is the McQueen Quattlebaum Endowed Associate Professor of Human-Centered Computing and the Founding Director of the Team Research Analytics in Computational Environments (TRACE) Research Group in the School of Computing at Clemson University. Dr. McNeese held the College of Engineering, Computing and Applied Sciences Dean's Professorship at Clemson prior to his current endowed appointment. He is a pioneer in the field of human-AI teaming and has significantly helped to promote a human-centered AI approach to the research and development of AI systems. He is the recipient of the NSF CAREER Award, the Clemson University Researcher of the Year, the HFES William C. Howell Young Investigator Award, and The Pennsylvania State University College of Information Sciences & Technology Overall Outstanding Alumni Award among additional significant honors. He received a Ph.D. in Information Sciences & Technology and a B.S in Psychology from The Pennsylvania State University.

Michael Muller works as a Senior Research Scientist at IBM Research. Michael's research emphasizes how technologies can be (re-)designed to support human goals and human flourishing. Using both qualitative and quantitative methods, Michael and colleagues have shown how participatory methods can bring greater information, greater commitment, and greater democracy to systems and policies that humans use. Michael and colleagues subsequently focused on collaborative technologies for groups in organizations. Michael has also studied how humans shape supposedly "objective" AI systems and applications through relatively unexamined work practices, and how humans can use AI systems for human-AI co-creativity. Michael has been recognized as an ACM Distinguished Scientist and a member of the ACM SIGCHI CHI Academy. Michael's service work includes co-founding and co-chairing the ACM SIGCHI academic review subcommittee on Critical and Sustainable Computing and Social Justice; co-chairing ACM SIGCHI CARES committee to assist people who have encountered discrimination, harassment and/or bullying; and co-organizing numerous workshops and symposia to benefit early career scholars. Michael serves on the National Academies Board On Human Systems Integration.