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Keynote

Harder, Better, Faster, Stronger: Visualization for Human-Centered AI Tools

Niklas Elmqvist

Villum Investigator & Professor of Computer Science, Aarhus University

Abstract

Human-centered AI (HCAI), rather than replacing the human, puts the human user in the driver's seat of so-called HCAI tools: interactive software tools that amplify, augment, empower, and enhance human performance using the new generation of AI models. In this talk, I will discuss how interactive visualization and visual analytics can be a key enabling technology for creating such HCAI tools in practice. Visualization has already been shown to be a fundamental component in explainable AI models, and coupling this with data-driven, semantic, and integrated interaction feedback loops will enable a human-centered model for integrating AI models in the loop with human users. I will present several examples of our past and current work on such HCAI tools, including for creative writing, visual and UX design, and computational notebooks. I will then draw parallels between these tools to suggest common themes on how interactive visualization and visual analytics can support the design of future HCAI tools.

-<https://doi.org/10.48550/arXiv.2404.02147>

Short Biography

Niklas Elmqvist (he/him/his) is a Villum Investigator, an IEEE Fellow, and a full professor in the Department of Computer Science at Aarhus University in Aarhus, Denmark. He received his Ph.D. in computer science in 2006 from Chalmers University in Gothenburg, Sweden. Prior to joining Aarhus, he was faculty at University of Maryland in College Park, MD, USA from 2014 to 2023, and at Purdue University in West Lafayette, IN, USA from 2008 to 2014. From 2016 to 2021, he served as the director of the Human-Computer Interaction Laboratory (HCIL) at University of Maryland, one of the oldest and most well-known HCI research labs in the country. His research area is data visualization, human-computer interaction, and visual analytics. He is the recipient of NSF CAREER and Villum Investigator grants as well as best paper awards from the IEEE Information Visualization conference, the ACM CHI conference, the International Journal of Virtual Reality, and the ASME IDETC/CIE conference. He was papers chair for IEEE InfoVis 2016, 2017, and 2020, subcommittee chair for ACM CHI 2020 and 2021, and papers chair for IEEE PacificVis and IEEE VIS in 2024. He joined the VIS Steering Committee in 2023. He is also an associate editor for International Journal of Human-Computer Studies and the Information Visualization journal. In addition, he serves as series editor of the Springer Nature Synthesis Lectures on Visualization. His research has been funded by both U.S. federal agencies such as NSF, NIH, and DHS as well as by companies such as Google, NVIDIA, and Microsoft. He is the recipient of the Purdue Student Government Graduate Mentoring Award (2014), the Ruth and Joel Spira Outstanding Teacher Award (2012), and the Purdue ECE Chicago Alumni New Faculty award (2010). He was elevated to the rank of IEEE Fellow in 2024 and ACM Distinguished Scientist in 2018.