Institute for Visualization and Interactive Systems

Seminar

Human-AI Interaction and Visual Explanation of AI

The combination of interactive visualization with AI approaches has been extensively researched in the field of visual analytics and other data science-related disciplines. These efforts led to many improvements in data analysis and exploration methods. In particular, complex tasks involving high-dimensional, heterogeneous, and dynamic data sets were supported with such solutions. The development of generative approaches, including Large Language Models (LLMs), has added the means to support creative tasks but also to solve sensemaking problems.

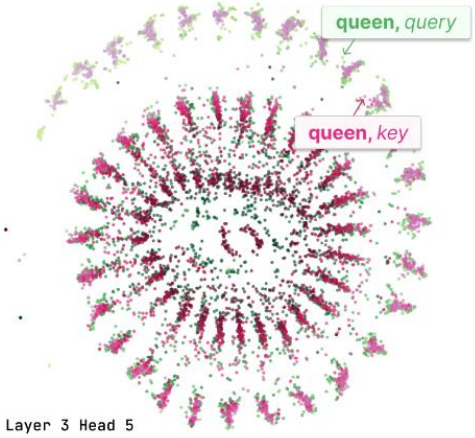

Figure 1: Global Transformer Attention, Yeh et al., 2023 [1]

The seminar highlights and discusses the role of interactive visualization for both classical Machine Learning (ML) approaches and recent generative AI developments. This includes interactive visual workflows to support data analysis and creative tasks beyond using command lines and mere prompting. Another focus will be on visualization methods that help configure, train, and evaluate AI approaches.

Fascinating research questions arise in the areas mentioned above. For example, how trustworthy AI results are, how interactive visualization can support assessment even when ground truth is lacking, how interactive workflows can enable users to steer AI methods, how bias in models can be detected, and many more.

Figure 2: Neural Canvas, Shen et al., 2024 [2]

The seminar participants will present and discuss the role of interactive visualization in the abovementioned areas. Each participant will be assigned a sub-topic for which they have to research related work based on articles provided by the seminar organizers. All participants will give a presentation explaining their topic to the other seminar participants. Additionally, all participants have to write an article summarizing and highlighting important details of their respective topic.

Target Group:
Master's students in the field of Computer Science

Language:
English

Room/Location:
The seminar will take place in the summer semester 2025 at the Computer Science building. Details will be available in C@MPUS.

Contact Person:
Dr. Steffen Koch
www.vis.uni-stuttgart.de

References:

[1] Yeh, Catherine, et al. "AttentionViz: A Global View of Transformer Attention." arXiv preprint arXiv:2305.03210 (2023).

[2] Shen, Yulin et al. Neural Canvas: Supporting Scenic Design Prototyping by Integrating 3D Sketching and Generative AI. In Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems. https://doi.org/10.1145/3613904.3642096