

KEYNOTE TALK

Wednesday, November 19, 2025 at 9:00 am

Towards Generative Human-Centric Network Visualization

Yifan Hu

University of Maryland at College Park

Abstract: Network visualization has traditionally relied on heuristics, assuming that optimizing specific metrics, such as stress, naturally leads to aesthetic and informative layouts. However, studies have shown that no single metric consistently produces the most effective visualization. We believe a data-driven alternative may offer a more human-centric solution. This involves collecting large amounts of human-labeled data, where human annotators indicate their preferred visualization among many options for the same graph. These data are then used to train a generative model to approximate human aesthetic preferences. In this talk, I will discuss our efforts in exploring the use of deep learning for this kind of human-centric network visualization. In particular, I will discuss our efforts in answering three questions: 1) Can deep learning models be used to optimize traditional aesthetic metrics? 2) Can deep learning models learn to produce effective layouts purely from examples of "good" visualizations? 3) Can vision models and LLMs predict and align with human aesthetic preferences?



Speaker Bio-Sketch: Yifan Hu is a Professor of Practice at Northeastern University. Before joining Northeastern, he was a Senior Manager of Science at Amazon, where he led a team of Applied Scientists developing AI and machine learning solutions for Amazon Search Advertising. Before that, he served as Senior Director of Research at Yahoo Research, focusing on machine learning, NLP, and data visualization applied to content, advertising, and security systems. Earlier in his career, he held research roles at AT&T Labs, Wolfram Research, and Daresbury Laboratory, working on graph visualization, recommender systems, optimization, and high-performance computing. He holds a B.S. and M.S. in Applied Mathematics from Shanghai Jiao Tong University and a Ph.D. in Optimization from Loughborough University. His research interests include information visualization, AI, machine learning, NLP, and large language models. His work has received multiple best paper awards, including the 2017 IEEE ICDM 10-Year Highest Impact Award for his work in recommender systems. He currently serves as an Associate Editor for the IEEE Transactions on Visualization and Computer Graphics.