

Yuheng Zhao

ELLIS (Finland) PostDoc, starting from 2026.8

Tel: +86 152-0714-7890 | Email: yuhengzhao@fudan.edu.cn |  Google Scholar (800+) |  <https://zyh1222.github.io>

EDUCATION

- **Fudan University, School of Data Science** Sep. 2022 - Jun. 2026 (estimated)
Supervised by *Prof. Siming Chen, FDUVIS Lab* Shanghai, China
 - PhD in Statistics, specializing in visual analytics and human-centered AI. Recent research interest is agentic visual analytics system based on LLMs
- **University of Edinburgh, School of Informatics** Sep. 2025 - Feb. 2026
Supervised by *Prof. Benjamin Bach* Edinburgh, United Kingdom
 - Visiting PhD student, sponsored by China Scholarship Council.
- **Hong Kong University of Science and Technology, School of Science** Sep. 2020 - Nov. 2021
Supervised by *Prof. Michael K Y Wong* Hong Kong SAR, China
 - Master of Science in Data-driven Modeling
- **Huazhong Agricultural University, School of Science** Sep. 2016 - Jun. 2020
Supervised by *Prof. Feng Shi* Wuhan, China
 - Bachelor of Science in Information and Computation Science

MAIN PROJECTS (FIRST AUTHOR)

- **Proactive LLM-based UI Agent for Intelligent Data Analysis** 2025
Advisor: Prof. Siming Chen (Fudan University)
 - The first Proactive LLM agent visual analytics framework (ProactiveVA), shifting LLM agents from reactive responses to active assistance for visual data analysis. Develop a three-stage GUI agent pipeline (perception, reasoning, acting) to autonomously detect user needs and provide real-time guidance through interaction simulation [2]. Published in IEEE TVCG (VIS'25, top-tier journal in Computer Graphics).
- **LLM-based Understanding of Biological Multi-omics Data** 2025
Advisor: Prof. Qi Liu (Tongji University), Prof. Fabian J. Theis (Helmholtz Center Munich)
 - Propose CellHermes, a biological large language model that integrates multimodal forms of omics data, such as transcriptomic profile and PPI network, through natural language for better omics understanding.
 - Responsible for the modeling method, reformulating multi-omics data into natural language question-answer structures to establish a unified cross-modal modeling paradigm. Explored a human-AI collaborative reasoning framework centered on language to enhance model interpretability and generalization. The paper is co-first authored and submitted to Nature Methods (revision) [1].
- **LightWeight Visual Analytics Framework with LLM Agent-Based Task Decomposition** 2024
Advisor: Prof. Siming Chen (Fudan University)
 - Propose a lightweight visual analytics framework (LightVA) based on an LLM agent task planning algorithm to support automatic task decomposition and generate interfaces in a malleable way [3]. User and agent co-edit the workflow to complete the analysis. Paper was published in IEEE TVCG 2025, presented at IEEE VIS'25 (**Popular article**).
 - Develop an LLM-driven dashboard generation approach based on retrieval-augmented generation [11]. Paper was published in IEEE PacificVis'25 (**Best paper honorable mention**).
- **Using Large Language Models to Enhance Visual Analytics Systems** 2024
Advisor: Prof. Siming Chen, Dr. Yu Zhang (Oxford University), Prof. Cagatay Turkey (Warwick University)
 - The first framework (LEVA) that integrates LLMs to enhance the user's visual analytics workflow in three pivotal stages: onboarding, exploration, and summarization [4]. We define a grammar of VA systems to enable LLM to understand user activity on the VA system, recommend tasks by building task models and calculate insights through tool calling. Paper was published in IEEE TVCG 2025, presented at IEEE VIS'24 (**Popular article, ESI highly cited paper (1%)**).

• Dynamic Topic Modeling and Pattern Comparison

2023

Advisor: Prof. Siming Chen (Fudan University)

- Propose a visual analytics approach (ContextWing) that supports pair-wise comparison in social media data streams. Develop a system to explore patterns of contexts in both static and streaming settings [6]. Paper was published in ACM CSCW (top-tier conference in HCI), 2023.

• Metaverse & Immersive Analytics

2022

Advisor: Prof. Siming Chen (Fudan University)

- Propose the first conceptual framework summarizing the status of metaverse research from perspectives of graphics, interaction, and visualization techniques [7]. Paper was published in Visual Informatics, 2022 (**Top 1 cited - 537**)
- Propose a 3D visualization metaphor to support immersive and interactive analysis of textual data in a VR environment [5]. Paper was published in IEEE PacificVis 2025.

PUBLICATIONS

- [1] Yicheng Gao*, Weixu Wang*, **Yuheng Zhao***, Kejing Dong*, Caihua Shan, Weizhong Zheng, Till Richter, Zekai Li, Siming Chen, Fabian J. Theis, Qi Liu. **"Language May Be All Omics Needs: Harmonizing Multimodal Data for Omics Understanding with CellHermes"**, *Nature Methods (revision)*, 2025.
- [2] **Yuheng Zhao**, Xueli Shu, Liwen Fan, Lin Gao, Yu Zhang, Siming Chen. **"ProactiveVA: Proactive Visual Analytics with LLM-based UI Agent"**, *IEEE Transactions on Visualization and Computer Graphics (VIS'25)*, 2026.
- [3] **Yuheng Zhao**, Junjie Wang, Linbing Xiang, Xiaowen Zhang, Zifei Guo, Cagatay Turkay, Yu Zhang, Siming Chen. **"LightVA: Lightweight Visual Analytics with LLM Agent-Based Task Planning and Execution"**, *IEEE Transactions on Visualization and Computer Graphics (TVCG)*, 2025.
- [4] **Yuheng Zhao**, Yixing Zhang, Yu Zhang, Xinyi Zhao, Junjie Wang, Zekai Shao, Cagatay Turkay, Siming Chen. **"LEVA: Using Large Language Models to Enhance Visual Analytics"**, *IEEE Transactions on Visualization and Computer Graphics (TVCG)*, 2025.
- [5] Jiang, Jinjing*, **Yuheng Zhao***, Jun-Hsiang Yao, Huiting Wang, Xuexi Wang, Lana Blue, Chen Guo, Xudong Li, and Siming Chen. **"Social Media Island: Interactive User Profiling and Information Diffusion Exploration with 3D Visual Metaphors"**, *Proceedings of the 18th IEEE Pacific Visualization Conference (PacificVis'25)*, 2025.
- [6] **Yuheng Zhao**, Xinyu Wang, Chen Guo, Min Lu, Siming Chen. **"ContextWing: Pair-wise Visual Comparison for Evolving Sequential Patterns of Contexts in Social Media Data Streams"**, *Proceedings of ACM SIGCHI Conference on Computer-Supported Cooperative Work and Social Computing (CSCW)*, 2023.
- [7] **Yuheng Zhao**, Jinjing Jiang, Yi Chen, Richen Liu, Yalong Yang, Xiangyang Xue, Siming Chen. **"Metaverse: Perspectives from graphics, interactions and visualization"**, *Visual Informatics*, 2022.
- [8] Lin Gao, Leixian Shen, **Yuheng Zhao**, Jiexiang Lan, Huamin Qu, Siming Chen. **"SceneLoom: Communicating Data with Scene Context"**, *IEEE Transactions on Visualization and Computer Graphics (VIS'25)*, 2025.
- [9] Yifei Zhang, Lin-Ping Yuan, **Yuheng Zhao**, Jielin Feng, Siming Chen. **"KinemaFX: A Kinematic-Driven Interactive System for Particle Effect Exploration and Customization"**, *Proceedings of the 37th Annual ACM Symposium on User Interface Software and Technology (UIST'25)*, 2025.
- [10] Jielin Feng, Xinwu Ye, Qianhui Li, Verena Prantl, Jun-Hsiang Yao, **Yuheng Zhao**, Yun Wang, Siming Chen. **"InfoAlign: A Human-AI Co-Creation System for Storytelling with Infographics"**, *Proceedings of the CHI Conference on Human Factors in Computing Systems*, 2026.
- [11] Qiu, Tian, Fen Wang, Shaohua Huang, Meng Guo, **Yuheng Zhao**, Jincheng Li, and Siming Chen. **"SmartMLVs: LLM-enabled Multiple Linked Views Generation for Interactive Visualization"**, *Proceedings of the 18th IEEE Pacific Visualization Conference (PacificVis'25) Best Paper Honorable Mention*, 2025.
- [12] Chongke Bi, Xin Gao, Baofeng Fu, **Yuheng Zhao**, Siming Chen, Ying Zhao, Yunhai Wang. **"PCLVis: Visual Analytics of Process Communication Latency in Large-Scale Simulation"**, *Computational Visual Media Journal*, 2024.
- [13] Zekai Shao, Shuran Sun, **Yuheng Zhao**, Siyuan Wang, Zhongyu Wei, Cagatay Turkay, Siming Chen. **"Visual Exploration of the Reading Comprehension Question Answering Model for Improving the Interpretability"**, *IEEE Transactions on Visualization and Computer Graphics (TVCG)*, 2023.
- [14] Yu Zhang, Ruike Jiang, Liwenhan Xie, **Yuheng Zhao**, Can Liu, Tianhong Ding, Siming Chen, Xiaoru Yuan. **"OldVisOnline: Curating a Dataset of Historical Visualizations"**, *IEEE Transactions on Visualization and Computer Graphics (VIS'23)*, 2023.
- [15] Lei Peng, **Yuheng Zhao**, Yijie Hou, Qinghong Wang, Siqi Shen, Xingui Lai, Juntong Gao, Jiaqi Dong, Ziyue Lin, Siming Chen. **"Mixed-Initiative Visual Exploration of Social Media Text and Events"**, *Proceedings of IEEE VIS, IEEE VAST Challenge 2021 (Poster) - Award for Strong Human-in-the-Loop Analysis Methodology*, 2021.

AWARDS & GRANTS

- **Outstanding Graduate of Shanghai** 2026
Shanghai Municipal Education Commission
- **Outstanding Students of Fudan University** 2026
Fudan University
- **Best Paper Honorable mention** 2025
IEEE PacificVIS Conference
- **PhD Joint Research Scholarship at University of Edinburgh** 2024
China Scholarship Council (CSC)
- **First-class scholarship for PhD students** 2022-2024
Fudan University
- **China International College Students' Innovation Competition, Gold Award** 2024
Ministry of Education, P.R. China
- **IEEE VAST Challenge MC2 - Outstanding Comprehensive Solution Award** 2021
IEEE VAST Challenge
- **IEEE VAST Challenge MC3 - Award for Strong Human-in-the-Loop Analysis Methodology** 2021
IEEE VIS Conference
- **Outstanding Freshman Scholarship for postgraduate students** 2020
Hong Kong University of Science and Technology (HKUST)
- **The 9th MathorCup University Mathematical Modeling Challenge, First Prize** 2019
Chinese Society of Optimization, Overall Planning, and Economic Mathematics

WORKING EXPERIENCE

- **Huawei Co Ltd | 2012 Lab, Central Software Institute** Jul. 2023 - Sep. 2023
Research Intern, mentored by Dr. Yu Zhang
Shanghai, China
 - Developed LLM-enhanced visual analytics algorithm and system [4], applied to business intelligence.
- **BGI Genomics Co Ltd | Bioinformatics Lab** Jul. 2020 - Sep. 2020
Algorithm Engineer Intern
Shenzhen, China
 - Optimized algorithms for the detection of gene structural variation.
- **Fudan University | School of Data Science, FDUVIS Lab** Nov. 2021 - Jun. 2022
Research Assistant, collaborated with Prof. Siming Chen
Shanghai, China
 - Developed algorithms for dynamic topic modeling and systems for social media visual analytics [6], [5].

INVITED TALKS

- **IEEE VIS 2025 Doctoral Colloquium** Nov 1, 2025, Vienna
Talk Title: LLM-Driven Intelligent Visual Analytics
- **ChinaVis 2024 Doctoral Colloquium** July 19, 2024, Hong Kong
Talk Title: LLM Agent-Based Task Planning and Execution for Intelligent Visual Analytics
- **GAMES: Graphics And Mixed Environment Symposium Webinar 2024 No.323** May 16, 2024, Online
Talk Title: Large Language Models Driven Intelligent Visual Analytics
- **Fudan University 120th Anniversary Series of Lectures** May 27, 2025, Shanghai
Talk Title: Agent-based Intelligent Visual Analytics
- **The 5th CCF CSCW & Social Computing Summer School** August 27, 2023, Suzhou
Talk Title: Textual Data Visual Analytics

ACADEMIA SERVICE

Program Committee: IEEE VIS Posters 2026, IEEE PacificVis 2026, EuroVis Posters and Demos 2026, ChinaVis 2026, VINCI 2024–2026

Peer Reviewing:

- Journal: IEEE TVCG (2023-2026), IEEE CG&A (2025), Computers & Graphics (2025), The Visual Computer (2025-2026), Visual Informatics (2023-2026)
- Conference: IEEE VIS (2024–2026), ACM UIST (2025–2026), ACM CHI (2024–2025), ACM CSCW (2024), EuroVis (2026), IEEE PacificVis (2024–2026), ChinaVis (2024, 2026), VINCI (2024–2026)

Session Chair: China-R Conference (AI+VIS Session, 2023)

TEACHING

2022 Fall - Data Visualization and Application — Teaching Assistant, Fudan University

- Assisted in teaching a course with over 80 students; developed and delivered tutorials on visual analytics tools, HTML, Javascript and Python, and graded assignments.