Shenghan Gao

4^{th} CS B.Eng, School of Information Science and Technology (SIST), ShanghaiTech University

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Education

ShanghaiTech University — Shanghai, China

Undergraduates, Major: Computer Science — Sep. 2021 - Jun. 2025

- Research Interests: **Data-driven Approaches to Human-centered Computing**
- GPA: 3.79 / 4.00 (Rank: 11/234), Major GPA: 3.95 / 4.00
- Relevant Courses: Human-Computer Interaction (A+), Data Visualization, Data Mining, Introduction to Machine Learning (A+), Algorithms and Data Structures, and necessary mathematical knowledge.

University of California, Berkeley — Berkeley, CA

Exchange Student in EECS — Aug. 2023 - Dec. 2023

- GPA: 4.00 / 4.00
- Relevant Courses: Introduction to Software Engineering, Efficient Algorithms and Intractable Problems (A+), Introduction to Artificial Intelligence

Research Experience

ViSeer LAB, SIST, ShanghaiTech University — Shanghai

Research Intern supervised by *Prof. Quan Li* | Human-Computer Interaction, Data Visualization — Dec. 2022 - Present

- Contribute to **understanding human behaviors** (**LiveRetro, TaLens and DIVAS**) and **enhancing Human-AI collaboration** (**SQLGenie**) through developing and evaluating multiple interactive and visual analytics systems.
- **Model human behaviors**, how individuals approach complex problem-solving using data visualization techniques by conducting quantitative analyses of visual analytics (VA) literature.

Publication

[1] Yuchen Wu, Yuansong Xu, **Shenghan Gao**, Xingbo Wang, Wenkai Song, Zhiheng Nie, Xiaomeng Fan, Quan Li. LiveRetro: Visual Analytics for Strategic Retrospect in Livestream E-Commerce. In IEEE Transactions on Visualization and Computer Graphics (Proc. VIS 2023).

[2] Yuchen Wu, **Shenghan Gao**, Shizhen Zhang, Xiaofeng Dou, Xingbo Wang, Quan Li. From Requirement to Solution: Unveiling Problem-Driven Design Patterns in Visual Analytics. In IEEE Transactions on Visualization and Computer Graphics Fast Track. (under review)

Reserach Projects

LiveRetro: Visual Analytics for Strategic Retrospect in Livestream E-Commerce

Yuchen Wu, Yuansong Xu, **Shenghan Gao**, Xingbo Wang, Wenkai Song, Zhiheng Nie, Xiaomeng Fan, Quan Li — Dec. 2022 - Apr. 2023

- Implemented **LiveRetro**,an interactive visual analytics system, supporting the retrospective analysis of livestream e-commerce strategies from a multifaceted and empirical perspective.
- Identified design requirements supporting a comprehensive strategic retrospect in livestream e-commerce and informative computational features that facilitate the analysis of live performance.
- Conducted case studies and expert interviews that proved the effectiveness and usability of the system.

From Requirement to Solution: Unveiling Problem-Driven Design Patterns in Visual Analytics

Yuchen Wu, **Shenghan Gao**, Shizhen Zhang, Xiaofeng Dou, Xingbo Wang, Quan Li — Dec. 2023 - Apr. 2024

- Presented a methodology of meta-analysis for VA research from a problem-driven perspective.
- Contributed a solution typology and refined typologies of requirement and data, formulating updated abstraction frameworks for VA.
- Unveiled problem-solving practice of VA research through a dense, directed, and weighted graph.

SQLGenie: Enhancing Human-LLM Collaboration for Improved SQL Query Generation through Interactive Visualization and Real-Time Feedback

Submitted to CHI 2025 — May. 2024 - Sep. 2024

- Developed a prototype system, **SQLGenie**, which integrates various human-computer interaction(HCI) techniques to enhance the human-LLM collaboration in NL2SQL scenarios
- Conducted a formative study (N=10) to gain in-depth insights into general SQL writing workflows and the challenges with LLMs in SQL generation.
- Validated the effectiveness of our approach through two user studies and provided implcations for designing LLM-driven CUIs in other vertical fields.

TaLens: Exploring the Impact of Talent Mobility in Acquisitions on Metropolitan Statistical Area Innovation Capacity via Visual Analytics

In progress. Expect to submit to TVCG

- Developed **TaLens**, an interactive visual analytics system designed to uncover the effects of talent mobility.
- Conducted a thorough quantitative analysis of talent mobility's impact on MSA innovation capacity on a dataset with over 220,000 AI papers, 300,000 patents, and 5,000 acquisitions.
- Validated **TaLens** through case studies and expert interviews, demonstrating its practicality and enhancing users' understanding of talent mobility's influence on MSA innovation capacity.

Course Projects

Which Comment Should I Look At? A Data-Driven Analysis of Developer Reviews

Shenghan Gao, Mingzheng Wu, *Prof. Haipeng Zhang* supervising | CS173 Data Mining — Feb. 2024 - Jun. 2024

- Led a quantitative analysis of feature importance from the developers' perspective, using data crawled from Steam.
- Developed two indicators to assess the value of comments based on developers' reviews.
- Employed traditional statistical methods, such as the Pearson correlation coefficient, alongside recommendation models and Explainable AI techniques like SHAP to quantify feature importance.

House Price Prediction System Based on Ensemble Learning

Shenghan Gao, Pengyu Long, *Prof. Ziping Zhao* supervising | CS182 Introduction to Machine Learning — May. 2024 - Jun. 2024

- Developed an ensemble learning system to predict house prices, leveraging multiple machine learning models such as random forest, gradient boosting, and stacking methods.
- Implemented feature engineering techniques, calculating feature covariances to optimize the selection of important variables impacting house prices.
- Designed a multi-stage modeling pipeline, using both base models and meta-models to enhance accuracy through stacked generalization.
- Applied cross-validation techniques to optimize hyperparameters and improve model performance, achieving a final predictive model with a score ranking in the top 5.5% on the Kaggle competition leaderboard.

DIVAS: A Visual Analysis System for Vehicle Driver Profiles

Shenghan Gao, Shuhao Zhang, Xiaofeng Dou, Xiyuan Wang, *Prof. Quan Li* supervising | ChinaVIS Data Challenge 2023 Third Prize — Apr. 2023 - Jul. 2023

- Performed an in-depth analysis of traffic participants' driving behaviors.
- Designed a quantitative scoring framework for evaluating driver profiles.
- Developed **DIVAS**, an interactive visual analytics system to support experts in driver profiling.
- Conducted case studies demonstrating the system's effectiveness and usability.
- Delivered an oral presentation of the project at ChinaVis 2023.

Honors

The Special Scholarship for the Undergraduate 3+1 Overseas Exchange Program for the 2023-2024 academic year	Jun. 2024
Merit Student of ShanghaiTech University in 2022 - 2023	Dec. 2023
ChinaVis Data Challenge 2023 Third Price	Jul. 2023
Merit Student of ShanghaiTech University in 2021 - 2022	Nov. 2022

Services

Teaching Assistant

GEHA 1101 - Cultural Interaction between the East and West along the Silk Road & Maritime Silk Road	Sep. 2024 - Jan. 2025
GEHA 1242 - Human-Animal Interaction	Jul. 2024
ARTS 1422 - Data Visualization	Feb. 2024 - Jun. 2024

Extracurricular Activities

Student Mentor for Shangdao College	Sep. 2021 - Present
Volunteer work for ShanghaiTech Welcome Party	Sep. 2021

Skills

Program Language	Javascript, Python, C, C++, Ruby, SQL, etc
Framework	Vue, D3, jQuery, BootStrap, PyTorch, Rails, etc
3D Modeling	Blender, Inventor, SolidWorks, etc
Research	Human-Computer Interaction, Data Visualization, Data Mining, Machine Learning, Deep Learning, Agile Development, etc
Language	Mandarin (Native), English (TOEFL: 102)