Yuancheng (Remo) Shen

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Education

- **New York University** — New York, United States
  Ph.D. - Computer Science — *Sep. 2024 - May. 2029(exp)*
  Advisor: Prof. Robert Krueger
- **Shandong University** — Shandong, China
  Mater - Computer Science and Technology — *Sep. 2021 - Jun. 2024*
  Advisor: Prof. Yunhai Wang
  Courses: *Human-Computer Interaction, Interactive Data Analysis System, Artificial Intelligence, Machine Learning*
- **Jiangsu University of Science and Technology** — Jiangsu, China
  Bachelor - Computer Science and Technology — *Sep. 2017 - Jun. 2021*
  GPA: Official: 3.85; Major: 3.95; Ranking: 2/102
  Courses: *Operating Systems, Data Structures, Analysis Of Algorithms, Computer Graphics, Networking, Databases*

Publications

[P1] Chahat Kalsi, **Yuancheng Shen**, Sophia Gaupp, Luca Reichmann, Meri Rogava, Michael Krone, Saeed Boorboor and Robert Krueger. BioSET2 - Biomarker-based Spatial co-Expression analysis in Tumor environments. In *IEEE VIS 2025* (Award of Excellence).

[P2] **Yuancheng Shen**, Yue Zhao, Yunhai Wang, Tong Ge, Haoyan Shi and Bongshin Lee. Authoring Data-Driven Chart Animations through Direct Manipulation. In *IEEE Transactions on Visualization and Computer Graphics, 2024.* (DOI: 10.1109/TVCG.2024.3491504).

[P3] Tao Dai, Qi Wang, **Yuancheng Shen**, Shang Gao. SwinVision: detecting small objects in low-light environments. In *IEEE Access, 2025* (DOI: 10.1109/ACCESS.2025.3548151).

[P4] **Yuancheng Shen**, Rui Ban, Xin Chen, Runduo Hua, Yunhai Wang. (2023). Anomaly Detection Algorithm for Network Device Configuration Based on Configuration Statement Tree. *Computer Science.*, vol. 50, no. 11A, pp. 230200128-10, 2023.

Research Experience

- **3D Cellular Interaction Visualization for Multiplexed Tissue Imaging** — New York University
  Collaborator |Advisor: Robert Krueger — *May 2025 - Sep 2025*
  - **Description**: Developed an end-to-end visual analytics workflow for the 3D microscopy challenge on melanoma Cyclic Immunofluorescence (CyCIF) data (70 channels, 6 resolution levels, up to 1.48 TB). The system supports large-scale identification and visualization of cell-cell interactions based on spatially co-located protein markers.
  - **Contribution**: Designed a scalable overview-to-detail visualization framework combining multi-resolution volume rendering, surface-based ROI exploration, and contextual biomarker querying. Implemented GPU-accelerated co-localization detection, semantic zooming for multi-scale exploration, and integrated semantic explanations to interpret spatial expression patterns in collaboration with biomedical experts from Northwell Health, NY.
- **Multi-Scale Visualization of Cellular Features in Cancerous Image Data** — New York University
  Student Leader |Advisor: Robert Krueger — *Nov 2024 - Present*
  - **Description**: Design an interactive visual analytics tool for multiplexed cancer tissue imaging, supporting dynamic marker composition and feature-based cell embedding to reveal spatial and expression-driven tissue structures.
  - **Contribution**: Develop coordinated views integrating spatial maps, expression scatterplots, and dendrograms; implemented scalable hierarchical clustering, semantic zooming, and progressive filtering to support multi-scale analysis and real-time performance in large-scale datasets.
- **Live-Cell Dynamic Cell Imaging Visual Analytics** — New York University
  Collaborator |Advisor: Robert Krueger — *Dec 2024 – Present*
  - **Description**: Develop a visualization system for analyzing live-cell imaging data, focusing on the dynamic interactions between immune and cancer cells using long-term 2D time-lapse microscopy.
  - **Contribution**: Implement interactive visualizations of cell trajectories to encode movement, interactions, and state transitions; Designed temporal filters and annotation tools to highlight immune killing events; Integrat trajectory data with biomarker expression and lineage tracking to support biological interpretation; Address challenges such as tracking noise and temporal resolution via adaptive smoothing and hierarchical time-window techniques.
- **PaleoVis: Fossil Morphology Visual Analytics** — New York University
  Collaborator |Advisor: Robert Krueger and Claudio Silva — *Oct 2024 – Present*
  - **Description**: Design interactive visual analytics tools for analyzing high-resolution 3D fossil morphology data generated by the PaleoScan platform, supporting fossil classification, taxonomic grouping, and evolutionary hypothesis testing.
  - **Contribution**: Developeing seamless multi-scale navigation using image pyramids and coordinated views to explore fossil structures from whole-body overviews to fine-grained features; Designing semantic clustering tools guided by expert annotations to support taxonomic analysis.

- **Authoring Data-Driven Chart Animations through Direct Manipulation [P1][Link]** Shandong University
  Student Leader |Advisor: Yunhai Wang and Bongshin Lee *Oct 2023 - Jun 2024*
  - **Description**: The research concentrates on an intuitive tool that empowers users without programming skills to author expressive chart animations through visual language, interactive editing, and smart recommendation strategies.
  - **Contribution**: Researched data animation syntax and tools; Proposed and implemented innovative ideas in consultation with two advisors; Took responsibility for paper writing and illustrations.
  - **Achievement**: Developed an interactive tool based on Canis syntax, enabling users to author data-driven chart animations with ease; Written a research paper.
- **SwinVision: Detecting Small Objects in Low-light Environments** Shandong University
  Collaborator |Advisor: Shang Gao *Jan 2024 - Sep 2024*
  - **Description**: The research focuses on a Swin Transformer-based framework for small object detection, integrating feature enhancement and specialized modules to improve accuracy and efficiency in low-light environments.
  - **Contribution**: Proposed innovative ideas and models for enhancing small object detection in low-light environments, ensuring a balanced approach between accuracy and efficiency; Contributed extensively to writing and refining the manuscript, with the majority of the content authored by me

Selected Honors and Awards

- NYU School of Engineering (SOE) PhD Fellowship, New york University *Sep, 2024*
- Outstanding Thesis Award, Shandong University *Jun, 2024*
- Outstanding Graduates Award, Shandong University *Jun, 2024*
- Postgraduate Excellent Student Award Fund, Shandong University *Oct, 2021*
- Outstanding Thesis Award, Jiangsu University of Science and Technology *Jun, 2021*
- Outstanding Graduates Award, Jiangsu University of Science and Technology *Jun, 2021*
- 1st Prize Scholarship, Jiangsu University of Science and Technology *Oct, 2019*
- 1st Prize in Higher Mathematics Competition, Jiangsu *Aug, 2018*

Reviews and Community Work

- **Reviewer**: Expert Systems With Applications; PeerJ Computer Science

Academic Engagements

- **International Conference on Geometric Modeling and Processing** Qingdao, China
  Participated in the event, received experts and scholars, and volunteered for other conference services *Jun 2024*
- **The Geometric Design and Computing Conference** Qingdao, China
  Participated in the event, received experts and scholars, and volunteered for other conference services *Aug 2022*
- **The China Visualization and Visual Analytics Conference** Xining, China
  Participated in the event *Jul 2022*

Skills

- **Tools**: TypeScript, JavaScript, NodeJs, Python, SQL, C++, R, Latex, Adobe Illustrator, PhotoShop
- **Soft Skills**: Leadership, Event Management, Writing, Public Speaking, Time Management