Yunfei (Mike) Lu

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EDUCATION

University of Notre Dame, IN, USA — Aug 2023 - Present
Ph.D. Student Computer Science and Engineering
- GPA: 3.92/4.00 | Research Interests: multimodal learning, computer vision, 3D vision, machine learning

Xidian University, Xi'an, China, — Aug 2019 - Jun 2023
B.Eng. Artificial Intelligence
- GPA: 3.9/4.0 | Ranking: 1/157

SKILLS

Programming Languages: C/C++, Python, MATLAB, JavaScript
Machine Learning & Data Science: PyTorch, Pandas, Numpy, Scikit-Learn, Scipy, OpenCV
Full Stack Development: HTML, CSS, Bootstrap, jQuery, Node, Express, EJS, React, Git, PostgreSQL, MySQL, Flask
Languages: Chinese (Native), English (Proficient; TOEFL 112; GRE 332)
Others: Unix & Linux Systems, Markdown, LaTeX, OpenCV, Paraview, Docker

PUBLICATIONS

Lu, Y., Gu, P., & Wang, C. (2024). FCNR: Fast Compressive Neural Representation of Visualization Images. *2024 IEEE Visualization and Visual Analytics (VIS)*. [Paper] [Code]

Yao, S., **Lu, Y.**, & Wang, C. (2024). ViSNeRF: Efficient and Flexible Visualization Synthesis Using Neural Radiance Fields. *IEEE Transactions on Visualization and Computer Graphics.* Under review.

RESEARCH

FCNR: Fast Compressive Neural Representation of Visualization Images — Aug. 2023 – Jun. 2024
- Generated a great many of visualization images for scientific data using both **volume rendering** and **isosurface rendering**.
- Built a model based on **stereo attention**, **stereo context modules** and **joint context transfer modules** to compress the visualization images with given parameters.
- Achieved significant improvements in speed and compression quality. The paper has been accepted by ***IEEE VIS 2024***.

ViSNeRF: Efficient and Flexible Visualization Synthesis Using Neural Radiance Fields — Jun. 2022 – Jan. 2024
- Proposed **ViSNeRF**, an efficient 3D visualization synthesis method using neural radiance fields, enabling high-quality view generation with fewer images and faster training times.
- Designed a hybrid architecture with factorization techniques, supporting flexible parameter exploration such as time steps and isovalues for dynamic scientific visualizations.
- Achieved up to **123×** faster training and up to **12×** faster inference compared to **NeRF**, with a PSNR of **37.32 dB** on DVR images. Results have been submitted to ***IEEE Transactions on Visualization and Computer Graphics*** (under peer review).

EXPERIENCE

Graduate Research Assistant, University of Notre Dame, IN, USA — Aug 2023 - Present
Conduct full-time research in
- SciVis **image** compression through deep learning methods;
- Transfer function optimization in volume rendering through multimodal models like **CLIP**;
- Medical image synthesis through **diffusion** model.

Computer Vision Engineer Intern, Vanyi Technology Co. Ltd., Vanke, Shenzhen, China — Aug 2022 - Oct 2022
- Implemented image preprocessing and mask generation for architectural plan datasets.
- Enhanced a model based on **stable diffusion** in **PyTorch** for generating complete architectural plans from partial sketches.
- Developed a system for converting incomplete sketches into detailed architectural plans.

PROJECTS

Personal Portfolio Template [Code] [Demo]
- Developed a dynamic and responsive personal portfolio template with easy-to-follow customization guides.
- **Technologies used**: HTML, CSS, JavaScript, React, Bootstrap, Hexo, AnyChart

Telegram Chats Analyzer [Code]
- Developed a web application for uploading, analyzing, and visualizing telegram chats.
- **Technologies used**: React, Bootstrap, Axios, PostgreSQL, Flask, Pandas

LSTMIS: LSTM-based Quantitative Portfolio Investment Strategy — Feb. 2022
- Implemented an LSTM-based model for price prediction and optimized the investment strategy with predicted data.
- **Technologies used**: PyTorch, NumPy, Backtrader

LEADERSHIPS, SERVICES & PRESENTATIONS

VIS 2024 Presenter, IEEE VIS 2024 [Web] [Video] — Oct 2024
Graduate Teaching Assistant, University of Notre Dame: for CSE-40166: *Computer Graphics* — Aug 2023 - Dec 2023
Football Team Leader, School of Artificial Intelligence, Xidian University — 2021 - 2022
Peer Mentor, Xidian University: designed and held lectures for students struggling with courses — 2020 - 2022

ACHIEVEMENTS

Graduate School Professional Development Award, University of Notre Dame — Aug. 2024
Outstanding Graduate of Shaanxi Province, Top 5% Graduates, Department of Education of Shaanxi — Jun. 2023
First-Class Graduate Scholarship, Top 5% Graduates, Xidian University — Jun. 2023
Meritorious Winner, ***Mathematical Contest in Modeling***, COMAP — May 2022
China National Scholarship, Top 0.2% Undergraduates Nationwide, Ministry of Education of China — Dec. 2020
First Prize, ***Mathematics Competition of Chinese College Students***, CMS — Dec. 2020