

Yunfei (Mike) Lu

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EDUCATION	University of Notre Dame, IN, USA Aug 2023 - May 2028 <i>Ph.D. Student Computer Science and Engineering</i> <ul style="list-style-type: none">GPA: 3.92/4.00Research Interests: multimodal learning, computer vision, 3D vision, machine learning Xidian University, Xi'an, China, Aug 2019 - Jun 2023 <i>B.Eng. Artificial Intelligence</i> <ul style="list-style-type: none">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 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
PUBLICATIONS	Lu, Y., Gu, P., & Wang, C. (2024). FCNR: Fast Compressive Neural Representation of Visualization Images. <i>2024 IEEE Visualization and Visual Analytics (VIS)</i> . [Paper] [Code] Yao, S., Lu, Y., & Wang, C. (2024). ViSNeRF: Efficient and Flexible Visualization Synthesis Using Neural Radiance Fields. <i>IEEE Transactions on Visualization and Computer Graphics</i> . Under review.
RESEARCH	FCNR: Fast Compressive Neural Representation of Visualization Images Aug. 2023 – Jun. 2024 <ul style="list-style-type: none">Generated a large collection of visualization images for scientific data using both direct 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. Accepted by <i>IEEE VIS 2024</i>. ViSNeRF: Efficient and Flexible Visualization Synthesis Using Neural Radiance Fields Jun. 2022 – Jan. 2024 <ul style="list-style-type: none">Proposed ViSNeRF based on TensoRF to efficiently reconstruct direct volume or isosurface rendering visualizations with a sparse set of labeled image samples.Generalized the architecture to enable flexible parameter-space exploration over timesteps, isovalues, and transfer functions with an 18.60% average PSNR gain over SOTA.Submitted to <i>IEEE Transactions on Visualization and Computer Graphics</i>. Under peer review now.
EXPERIENCE	Graduate Research Assistant , University of Notre Dame, IN, USA Aug 2023 - Present Conduct full-time research in <ul style="list-style-type: none">SciVis image compression through deep learning methods;Transfer function optimization in volume rendering through multimodal learning;Medical image synthesis through diffusion model. Computer Vision Engineer Intern , Vanyi Technology Co. Ltd., Vanke, Shenzhen, China Aug 2022 - Oct 2022 <ul style="list-style-type: none">Implemented image preprocessing and mask generation for architectural plan datasets.Enhanced a Stable-Diffusion-based model in PyTorch for generating complete architectural plans from partial sketches.Developed a system for converting incomplete sketches into detailed architectural plans.
PROJECTS	Telegram Chats Analyzer [Code] <ul style="list-style-type: none">Developed a web application for uploading, analyzing, and visualizing telegram chats. Built the frontend interface with React and beautified the style with Bootstrap. Enhanced the navigation with React-Router-DOM.Implemented the backend via Flask, conducted data processing with Pandas and managed the database via PostgreSQL. Realized the client-server communication using axios. LSTMIS: LSTM-based Quantitative Portfolio Investment Strategy Feb. 2022 <ul style="list-style-type: none">Implemented an LSTM-based model to predict the price of gold and bitcoin with historical data using PyTorch.Optimized the investment strategy with predicted data, EMA and Markowitz Mean Variance Model. Evaluated the strategy with backtesting using backtrader.
SERVICES & LEADERSHIPS	Graduate Teaching Assistant , University of Notre Dame: for CSE-40166: <i>Computer Graphics</i> 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