

# Yunfei (Mike) Lu

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EDUCATION	<b>University of Notre Dame, IN, USA</b> Aug 2023 - Present <i>Ph.D. Student Computer Science and Engineering</i> <ul style="list-style-type: none"><li>GPA: 3.92/4.00   Research Interests: multimodal learning, computer vision, 3D vision, machine learning</li></ul> <b>Xidian University, Xi'an, China,</b> Aug 2019 - Jun 2023 <i>B.Eng. Artificial Intelligence</i> <ul style="list-style-type: none"><li>GPA: 3.9/4.0   Ranking: 1/157</li></ul>
SKILLS	<b>Programming Languages:</b> C/C++, Python, MATLAB, JavaScript <b>Machine Learning &amp; Data Science:</b> PyTorch, Pandas, Numpy, Scikit-Learn, Scipy, OpenCV <b>Full Stack Development:</b> HTML, CSS, Bootstrap, jQuery, Node, Express, EJS, React, Git, PostgreSQL, MySQL, Flask <b>Languages:</b> Chinese (Native), English (Proficient; TOEFL 112; GRE 332) <b>Others:</b> Unix & Linux Systems, Markdown, $\LaTeX$ , OpenCV, Paraview, Docker
PUBLICATIONS	<b>Lu, Y.,</b> Gu, P., & Wang, C. (2024). FCNR: Fast Compressive Neural Representation of Visualization Images. <i>2024 IEEE Visualization and Visual Analytics (VIS)</i> . <a href="#">[Paper]</a> <a href="#">[Code]</a> Yao, S., <b>Lu, Y.,</b> & 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	<b>FCNR: Fast Compressive Neural Representation of Visualization Images</b> Aug. 2023 – Jun. 2024 <ul style="list-style-type: none"><li>Generated a great many of visualization images for scientific data using both <b>volume rendering</b> and <b>isosurface rendering</b>.</li><li>Built a model based on <b>stereo attention</b>, <b>stereo context modules</b> and <b>joint context transfer modules</b> to compress the visualization images with given parameters.</li><li>Achieved significant improvements in speed and compression quality. The paper has been accepted by <i>IEEE VIS 2024</i>.</li></ul> <b>ViSNeRF: Efficient and Flexible Visualization Synthesis Using Neural Radiance Fields</b> Jun. 2022 – Jan. 2024 <ul style="list-style-type: none"><li>Proposed <b>ViSNeRF</b>, an efficient 3D visualization synthesis method using neural radiance fields, enabling high-quality view generation with fewer images and faster training times.</li><li>Designed a hybrid architecture with factorization techniques, supporting flexible parameter exploration such as time steps and isovalues for dynamic scientific visualizations.</li><li>Achieved up to <b>123<math>\times</math></b> faster training and up to <b>12<math>\times</math></b> faster inference compared to <b>NeRF</b>, with a PSNR of <b>37.32 dB</b> on DVR images. Results have been submitted to <i>IEEE Transactions on Visualization and Computer Graphics</i> (under peer review).</li></ul>
EXPERIENCE	<b>Graduate Research Assistant</b> , University of Notre Dame, IN, USA Aug 2023 - Present Conduct full-time research in <ul style="list-style-type: none"><li>SciVis <b>image compression</b> through deep learning methods;</li><li>Transfer function optimization in volume rendering through multimodal models like <b>CLIP</b>;</li><li>Medical image synthesis through <b>diffusion</b> model.</li></ul> <b>Computer Vision Engineer Intern</b> , Vanyi Technology Co. Ltd., Vanke, Shenzhen, China Aug 2022 - Oct 2022 <ul style="list-style-type: none"><li>Implemented image preprocessing and mask generation for architectural plan datasets.</li><li>Enhanced a model based on <b>stable diffusion in PyTorch</b> for generating complete architectural plans from partial sketches.</li><li>Developed a system for converting incomplete sketches into detailed architectural plans.</li></ul>
PROJECTS	<b>Personal Portfolio Template</b> <a href="#">[Code]</a> <a href="#">[Demo]</a> <ul style="list-style-type: none"><li>Developed a dynamic and responsive personal portfolio template with easy-to-follow customization guides.</li><li><b>Technologies used:</b> HTML, CSS, JavaScript, React, Bootstrap, Hexo, AnyChart</li></ul> <b>Telegram Chats Analyzer</b> <a href="#">[Code]</a> <ul style="list-style-type: none"><li>Developed a web application for uploading, analyzing, and visualizing telegram chats.</li><li><b>Technologies used:</b> React, Bootstrap, Axios, PostgreSQL, Flask, Pandas</li></ul> <b>LSTMIS: LSTM-based Quantitative Portfolio Investment Strategy</b> Feb. 2022 <ul style="list-style-type: none"><li>Implemented an LSTM-based model for price prediction and optimized the investment strategy with predicted data.</li><li><b>Technologies used:</b> PyTorch, NumPy, Backtrader</li></ul>
LEADERSHIPS, SERVICES & PRESENTATIONS	<b>VIS 2024 Presenter</b> , IEEE VIS 2024 <a href="#">[Web]</a> <a href="#">[Video]</a> Oct 2024 <b>Graduate Teaching Assistant</b> , CSE-40166: <i>Computer Graphics</i> , University of Notre Dame Aug 2023 - Dec 2023 <b>Football Team Leader</b> , School of Artificial Intelligence, Xidian University 2021 - 2022 <b>Peer Mentor</b> , Xidian University: designed and held lectures for students struggling with courses 2020 - 2022
ACHIEVEMENTS	<b>Graduate School Professional Development Award</b> , University of Notre Dame Aug. 2024 <b>Outstanding Graduate of Shaanxi Province</b> , Top 5% Graduates, Department of Education of Shaanxi Jun. 2023 <b>First-Class Graduate Scholarship</b> , Top 5% Graduates, Xidian University Jun. 2023 <b>Meritorious Winner</b> , <i>Mathematical Contest in Modeling</i> , COMAP May 2022 <b>China National Scholarship</b> , Top 0.2% Undergraduates Nationwide, Ministry of Education of China Dec. 2020 <b>First Prize</b> , <i>Mathematics Competition of Chinese College Students</i> , CMS Dec. 2020