Yifan Xu

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Education

ShanghaiTech University **Sep. 2020 – June 2024**
Bachelor of Engineering in Computer Science *Shanghai, China*

University of Illinois at Urbana-Champaign **Aug. 2024 – May 2028**
Master Science in Computer Science - Information Management *Champaign, Illinois*

Experience

Tektronix, Inc - Supervised by Manager David Tian **Sep. 2023 – Jan. 2024**
Software Development Engineer Intern *Shanghai, China*

- Optimized the manual supplier application process to reduce communication costs caused by inconsistent data entry.
- Developed a supplier management tool using **Power Apps**, integrated with **SharePoint** and **Microsoft SQL** for seamless data management, supporting vendor registration, addition, deletion, and template duplication. The tool has been adopted by 148 users, streamlining supplier processes and improving operational efficiency.
- Automated the processing of daily bank receipt emails for the finance department using **Python** and **Power Automate**. Developed a system that automatically updates data in reports and streamlining financial operations .
- Explored ways to visualize and provide a daily report of sale performance to managers using **HTML** and **Power BI**.

ShanghaiTech University - Supervised by Prof. Song Liu **Feb. 2023 – Jan. 2024**
Undergraduate Research Intern *Shanghai, China*

- Explored super resolution and 3D reconstruction techniques to enhance the precision and speed of controlling nanorobots, typically observed under a Scanning Electron Microscope, where imaging quality and speed are inversely related.
- Optimized **NeRF** for the rapid reconstruction of nanotubes captured under SEM, utilizing nanorobots to enhance the dimension. This approach overcame the challenges of modeling at the microscopic scale in SEM imaging using **Python** and **Pytorch**. Xiang Fu, **Yifan Xu**, Hu Su*, Song Liu, **"NanoNeRF: Robot-assisted Nanoscale 360° reconstruction with neural radiance field under scanning electron microscope"**, Accepted by **IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)** and Selected by **Oral Representation**.
- Conducted extensive research on blind and non-blind super-resolution methods, from classification to application scenarios, and authored a comprehensive review paper. Ying Li, **Yifan Xu**, Hu Su, and Song Liu, **"A Review of Deep-learning-based Super-Resolution: from methods to applications"** , Accepted by **Pattern Recognition, paper id: 10.1016/j.patcog.2024.110935**

Projects

Jobify - Full Stack Job Application Management System | *MongoDB, Express, React, Node.js* **September 2024**

- Developed a full-stack web application using **MongoDB**, **Express**, **React**, and **Node.js** (MERN), enabling users to register, log in, and manage job applications.
- Implemented secure authentication and authorization with **JWT** and hashed passwords, connected the front-end and back-end using **Axios** and integrated cloud-hosted **MongoDB** database with **Atlas** .
- Deployed the complete application on **Render**, incorporated pagination, CRUD functionality, and data visualization using charts to enhance user experience and interface design.

BVH Accelerated Ray Tracing Scene | *C++, Eigen* **November 2022**

- Implemented **bounding volume hierarchy(BVH)** algorithm to significantly reduce computational costs in ray tracing complex mesh objects, which traditionally requires checking ray-triangle intersections for every ray.
- Implemented path tracing with Monte Carlo integration, combining direct and indirect lighting for realistic rendering.
- Developed an acceleration structure, BVH, to optimize the intersection process for complex meshes. By organizing the geometric objects into a bounding volume hierarchy (BVH), reduced the computation time significantly.
- Implemented ideal specular and translucent **BRDF** with refraction, simulating realistic materials like glass and mirror.
- Enhanced BVH efficiency by implementing **Surface Area Heuristic(SAH)**, introducing a cost function to evaluate partitions along the longest axis, further improving performance by 10% for each frame.

Technical Skills

Languages: Python, C++, Java, C, HTML/CSS, JavaScript, SQL, Markdown, Shell, R, MATLAB, RISC-V
Developer Tools: VS Code, Linux/Unix, MySql, Microsoft SQL, MongoDB, PostgreSQL, Multisim
Technologies/Frameworks: Flask, Django, Spring Boot, GitHub, Node.js, React, Cmake, Numpy, Pytorch ,Mongoose, Express, Excel
Relevant Coursework: Algorithms Analysis, Data Structures , Database Management, Artificial Intelligence, Deep Learning, Computer Graphics, Computer Architecture, Operating System, Computer Network