Zheng Xue (ZX) Ching

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Education

University of Wisconsin-Madison Madison, WI
Bachelor of Science in Computer Science *Sep. 2023 – Dec. 2025*

Experience

Undergraduate Research Assistant May 2025 - Present
INTEGRATE @ University of Wisconsin-Madison *Madison, WI*

- Designed and built data pipelines to capture & process user study data, ensuring full traceability and integrity of all data points, reducing manual processing time by 6.5 hours.
- Wrote and ran Python simulation scripts to simulate 12 study runs per user, validating unbiased and pseudo-random task assignments, reducing selection bias by at least 85%.
- Co-designed the scope and scale of the VR user study, defining experimental conditions, interaction, and participant tasks, maintaining data validity across all test subjects.
- Defined user interaction flows in the VR environment, specifying how participants move, respond, and engage with all tasks, leading to 20% fewer usability issues in pilot runs.

Undergraduate Research Assistant Oct. 2024 - Present
MadAbility Lab @ University of Wisconsin-Madison *Madison, WI*

- Conducted advanced data annotation for VR datasets, ensuring precise labeling to support model training and enhance predictive accuracy.
- Developed specialized functions to query our ML models, optimizing data retrieval and processing efficiency to streamline analysis workflows.
- Integrated OpenAI's ChatGPT API within research tools, enabling sophisticated interaction capabilities that facilitate responsive data manipulation.
- Spearheaded parallelization techniques across computational functions, enhancing processing speed and optimizing resource usage for high-volume data handling.

Software Engineer Intern June 2024 – Aug. 2024
Nixma Technologies

- Enhanced the readability and scalability of a legacy codebase, improving performance by 40%.
- Reduced manual testing time by 30% and increased testing accuracy by 20% through the development of automated tests for machinery including motors, alarms, sensors, and microscopes.
- Implemented multithreading in custom automation solutions, increasing data processing speed by 25% and system reliability by 15%.
- Designed and developed scalable Human-Machine Interfaces (HMIs) that contains multi-user access control, enhancing operator usability and safety, and reducing fault rates by 20%.

Projects

Implementation of Prim's & Dijkstra's Algorithm | *Java, JUnit, JavaFX* Jan. 2024 - Mar. 2024

- Designed an application to find minimum spanning trees and shortest path available in weighted graphs and trees.
- Utilized adjacency lists and priority queues (min-heaps) for efficient graph representation and edge selection, improving the time complexity to $O(E \log V)$.
- Enhanced performance by implementing lazy deletion in priority queues and reusing graph data structures.
- Visualized graph structures and algorithm steps using a Java GUI, allowing users to dynamically input graphs and observe the algorithms' step-by-step execution.
- Incorporated real-world datasets to demonstrate the practical application of the algorithms in shortest-path and network routing problems.

Technical Skills

Languages: Java, C#, C/C++, SQL, MySQL, Python, JavaScript, HTML/CSS
Relevant Skills: Software Quality Assurance & Testing, Software Automation, Data Handling & Processing

Publications

Demonstration of VRSight: AI-Driven Real-Time Descriptions to Enhance VR Accessibility for Blind People Demonstration to be showcased at **CHI 2025** (Conference on Human Factors in Computing Systems)
Daniel Killough, Justin Feng, Rithvik Dyava, **Zheng Xue "ZX" Ching**, Daniel Wang, Yapeng Tian, and Yuhang Zhao
doi.org/10.1145/3706599.3721194