Kevin Wang

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Skills

Languages: C++, Python, Java, Javascript, Rust, Bash, SQL, HTML/CSS
Tools: Git, AWS (EC2, S3, DynamoDB, Lambda), Kafka, PyTorch, LLVM, GCP, CMake, GDB, Valgrind, WWise, Jira, HuggingFace, Jeykll, React

Work Experience

U.S. Fulbright Program, Poland *Oct 2023 - present*
Student scholar - teaching faculty

- Developing an open-source **on-device chatbot** for usage as an **automated teaching assistant** in foreign language classes, able to generate and vocalize responses in less than five seconds while constrained to 4 GB of VRAM
- Creating materials and teaching weekly labs in introductory and intermediate computer science courses with C++ and Java
- **Founded the university's first coding club** and currently serving as faculty supervisor, leading game jams, guiding students through team coding projects, and giving talks on software engineering practices from the United States

Censored Planet Laboratory
Research assistant *Jul 2023 - Aug 2023*

- Investigated reinforcement learning sampling methods to intelligently adjust the volume and targets of network measurements, **accelerating workflow by 10x** and letting researchers **automatically detect changes in censorship patterns**
- Implemented a testing framework in Python, including **data preprocessing and simulation**, to evaluate sampling methods

Department of Computer Science and Engineering, University of Michigan
Graduate student instructor *Jan 2022 - Jul 2023*

- Taught three classes on **machine learning**, **introductory computer architecture**, and **introductory data structures and algorithms** in classes ranging from 60 to 1400 students, working on teams of teaching staff of sizes between 5 and 50
- Reviewed course content and supervised practical coding assignments in **weekly lab sessions with 30 students** per semester
- Supported course logistics outside of labs by hosting weekly office hours, writing and proctoring exams, grading student assignments, answering forum questions, and guiding students through large semester-long team projects

Bungie
Software engineering intern, platforms and partnerships *May 2022 - Aug 2022*

- Prototyped a novel video game controller rumble system in C++ using the WWise API and enabled integration into Bungie's Tiger engine, **used in the *Destiny* game franchise**, to **speed up designer workflow by 10-100x** for rumble events
- Enabled usage of platform-specific haptic features to **allow designers additional creative freedom** when making games
- Adjusted product to **align with requirements from multiple stakeholder groups totaling 150+ individuals** from engineering, design, audio, and platform teams, ensuring **long-term documentation and visibility** of prototype

Ford Autonomous Vehicles
Software engineering intern, full stack *May 2021 - Aug 2021*

- Built a new informational dashboard with **Java backend** and **React frontend** using **AWS DynamoDB and Lambda**, **Apache Kafka**, and **Spring Boot** to **continuously provide status** of **200+ connected vehicles** for internal and external users
- Integrated external APIs from Ford subsidiary Autonomic to process and include relevant third-party data on dashboard
- Practiced an **agile, CI/CD** workflow using **Jira** and **Jenkins** to rapidly iterate and deliver end product in three months

University of Michigan Transportation Research Institute
Student research team lead *Jan 2020 - Dec 2021*

- Produced and documented an application utilizing keypoint detection and clustering to categorize unlabeled image data, allowing researchers to **automatically annotate videos** used in research on automotive safety
- Set up team ceremonies, weekly sprints, and technical specs to **produce new data tools within one month** after onboarding

Projects

LLM-based joke generator with variable humor levels *Nov 2022 - Dec 2022*

- Annotated and augmented a text corpus from the r/jokes subreddit to create a **novel text dataset** of funny and unfunny jokes
- Combined humor detection methods with fine-tuned BART model to generate jokes with **variable humor level**

Upgraded LLVM loop tiling optimization pass *Nov 2022 - Dec 2022*

- Implemented custom optimization pass in LLVM's MLIR project using an algorithm selected from compiler literature, resulting in up to **16x fewer cache misses** on large matrix operations compared to MLIR's default loop tiling method

Virtual memory simulator *Nov 2021*

- Developed a virtual memory pager to allocate, manage, and free virtual memory pages, implemented UNIX fork and exec functions and generated test cases to verify pager and function implementations

Threading library *Oct 2022 - Nov 2022*

- Implemented concurrency primitives on single-processor and multiprocessor CPUs, including thread objects, mutexes, condition variables, and the OS-level infrastructure and logic for thread creation, queueing, and deletion

Mys-Query C++ search engine *Jan 2021 - May 2021*

- Created a **distributed, multithreaded** search engine from scratch **indexing 3 TB of site** data split across 30+ data servers
- Built high-performance parser, index builder, constraint solver, and utility library to ensure **scalability** and high throughput
- Led creation of novel feature to collect **anchor text for ranking**, improving search results for frequently referenced pages

Adversarial attacks on brain tumor segmentation data *Apr 2021*

- Demonstrated viability of adversarial attacks on machine learning models for cancer diagnosis and tumor segmentation
- Created novel attack with **decreased perturbation visibility** and **increased success rate** on state-of-the-art medical models

Volunteering and outreach

AI4All

Graduate student instructor *Jul 2022*

- Facilitated technical programming lessons for AI bootcamp targeting underrepresented high school students

Brilliant Little Fires

Principal investigator *May 2022 - Jul 2022*

- Conducted 40 online interviews with students and alumni at the University of Michigan about their experiences with burnout and imposter syndrome in school, then analyzed, summarized, and published results online

University of Michigan Machine Learning Theory Reading Group

Founder, main host *Jan 2022 - Apr 2022*

- Created a weekly reading group to discuss and analyze contemporary machine learning theory research and literature

Michigan Student Artificial Intelligence Lab (MSAIL)

Education initiative lead *Aug 2020 - May 2021*

- Created and taught lessons on selected topics in AI and machine learning to help acclimate newcomers to the organization
- Redesigned curriculum to more clearly communicate concepts, resulting in **improved student retention** and progress

Education

University of Michigan-Ann Arbor, MSE Computer Science and Engineering *Aug 2023*

University of Michigan-Ann Arbor, BSE Computer Science and Engineering *Dec 2021*

Summa cum laude, minor in music

Selected coursework: Compilers ● Network Security ● Operating Systems ● Database Management Systems ● System Design of a Search Engine ● Machine Learning ● Natural Language Processing ● Design and Analysis of Algorithms ● Category Theory ● Hardware and Software Verification ● Ethics for Artificial Intelligence