Kevin Wang

musicer@umich.edu | www.linkedin.com/in/kevin-wang-musicer | www.musicer-kw.com

Current student scholar in U.S. Fulbright Program teaching computer science. Wide-ranging experience including distributed C++ search engine, large-scale industry systems / full-stack roles, and ML research in security/vehicle safety.

Skills

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

Work Experience

Computer science teaching faculty at *U.S. Fulbright Program, Poland*   *Oct 2023 - present*
- 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 hosting labs in introductory/intermediate computer science with C++, Java, and Python
- **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

Research assistant at *Censored Planet Laboratory, University of Michigan*   *Jul 2023 - Aug 2023*
- Implemented and evaluated reinforcement learning sampling methods to automatically adjust volume and targets of network measurements on global censorship measurement platform, **speeding up researcher workflow by 10x**
- Wrote testing framework in Python, including **data preprocessing and simulation**, to assess chosen methods

Graduate student instructor at *CSE Department, University of Michigan*   *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, teaming with 5-50 other teaching staff
- Lectured and supervised hands-on code 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

Software engineering intern, platforms and partnerships at *Bungie*   *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**
- Enabled usage of platform-specific haptic features to **allow designers additional creative freedom**
- 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**

Software engineering intern, full stack at *Ford Autonomous Vehicles*   *May 2021 - Aug 2021*
- Built new informational dashboard with **Java backend** and **React frontend** using **AWS DynamoDB and Lambda**, **Apache Kafka**, and **Spring Boot** to **continuously provide status** on **200+ connected vehicles**
- Integrated external APIs from Ford subsidiary Autonomic to process and include relevant third-party data
- Practiced an **agile, CI/CD** workflow using **Jira** and **Jenkins** to rapidly iterate and deliver product in three months

Research team lead at *University of Michigan Transportation Research Institute*   *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**

Projects

Mys-Query C++ search engine
- Produced a **distributed, multithreaded search engine** from scratch indexing 3 TB of data across 30+ servers
- Designed serialization algorithm to efficiently store crawled site data in format quickly accessible by query client
- Led creation of novel feature to collect anchor text for ranking, improving search results for popular pages

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

Adversarial attacks on brain tumor segmentation data
- Demonstrated viability of adversarial attacks on ML models for cancer diagnosis and tumor segmentation
- Created novel attack with decreased perturbation visibility and increased success rate on SOTA medical models

Threading library
- Implemented UNIX-style thread objects, mutexes, and condition variables on single- and multi-processor CPUs
- Designed and wrote OS-level infrastructure and logic for thread creation, queueing, and deletion

LLM-based joke generator with variable humor levels
- Annotated and augmented corpus from r/jokes subreddit to create novel text dataset of funny and unfunny jokes
- Combined humor detection methods with fine-tuned BART model to generate jokes with variable humor level

Networked file server
- Implemented C++ netcode following TCP/IP protocols for a multithreaded remote file server supporting multiple clients with read/write permissions, custom file format on disk, and file consistency on crash / parition

Virtual memory simulator
- 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
- 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

Volunteering and outreach

Graduate student instructor for *AI4All*   *Jul 2022*
- Facilitated technical programming lessons for AI bootcamp targeting underrepresented high school students

Principal investigatory for *Brilliant Little Fires*   *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

Founder and president for *University of Michigan Machine Learning Theory Reading Group*   *Jan 2022 - Apr 2022*
- Created a weekly reading group to discuss and analyze contemporary machine learning theory literature

Education lead for *Michigan Student Artificial Intelligence Lab (MSAIL)*   *Aug 2020 - May 2021*
- Created and taught lessons on selected topics in AI and machine learning to help acclimate newcomers
- Redesigned curriculum to more clearly communicate concepts, improving **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