Seiya Kozakai

(206) 319-6646 - seiyak@umich.edu - linkedin.com/in/seiya-kozakai - https://github.com/skozakai - Redmond, WA

ACADEMICS

University of Michigan — Ann Arbor, MI
M.S.E. Electrical & Computer Engineering — Expected May 2025
B.S.E. Computer Engineering — May 2, 2024

Languages English (native), Japanese (native), Chinese (intermediate)
Technical Languages C, C++, Python, MATLAB, Rust, Julia, Java, JavaScript, Verilog
Tools & Frameworks ARMv8 (AArch64) & x86_64 ASM, Docker, FPGA, Git, Jupyter, Linux, Windows

WORK EXPERIENCE

Johns Hopkins Applied Physics Laboratory (APL) — **May 2023 - Aug 2023, May 2024 - Aug 2024**

Acoustic Algorithms Engineer Intern (Secret Clearance) — *Laurel, Maryland, US*

- Worked on various US Navy projects including one focused on side-scan sonar to detect deepsea mines, a vertical-line array to detect ships and submarines, and a Coastal Reconnaissance UAV with a multi-spectral detection system.
- Developed a novel custom API binding C++ Libraries and algorithms with Python data readers.
- Developed a signal pipeline to compare multiple bands of an image and estimate original color using MAP estimation.
- Created unit tests for various software projects using Pytest and GoogleTest, speeding development through CI/CD.
- Gained team development skills, pushing a project phase to completion 1 month ahead of schedule.

NCKU Intelligent Information Retrieval Laboratory — **June 2022 - September 2022**

Machine Learning & AI Intern — *Tainan, Taiwan*

- Analyzed recent developments in AI and deep learning research, such as the rise of transformers, with professor Chiang Jung-Hsien in National Cheng Kung University (NCKU), Taiwan.
- Implemented machine learning models such as CNN (Resnet) and GAN in the biomedical field.
- Proofread research papers of graduating master's students for linguistic and technical accuracy.

PROJECTS

High Frequency Trading System — *C++17, Docker, TCP/IP Sockets, Boost, CURL* — **September 2024 - Present**

- Developed a high-performance C++17 HFT system with sub-millisecond latency and 100,000+ messages/s throughput, optimizing memory with custom pool allocators, reducing heap allocations by 85%, and improving latency by 40%.
- Built a modular, event-driven system with thread pools for market processing, strategy execution, and order management, integrated with low-latency TCP/IP sockets, adaptive rate limiting, and achieving 99.99% uptime, 5m/s roundtrip.

LazyTune — *C/C++, Python3.11, DSP, Raspberry Pi, Arduino (Teensy 4.1)* — **September 2023 – December 2023**

- Designed and built a Digital Synthesizer from the ground up using a Raspberry Pi 4 and a Teensy 4.1 (Arduino).
- Developed an audio system using the PJRC Audio Library tool, creating a signal chain with a 12-band Vocoder and selectable effects that we controlled using a mixture of physical knobs, buttons, and graphical interface.
- Custom built a Pitch Shift tool, which paired with the PJRC Library Note Frequency tool allows us to produce Autotune. Implemented via a Phase Vocoder approach, adjusting small segments and recombining via Overlap and Add.
- Built system code in Python on the Raspberry Pi for handling MIDI signal forwarding from an AKAI MPK Mini II to the Teensy with a separate thread running the GUI which sends serial command to the Teensy to control effects chain.

Notes for Frontliners — *Python, React, NodeJs, Java, HTML, CSS* — **April 2020 – May 2021**

- Created a website (link) using React and NodeJs to collect gratitude notes during the Covid-19 Pandemic.
- Delivered notes to over 12 participating health & care facilities across the Greater Seattle Area.
- Designed the backend application for the Firebase server to manage data seamlessly.

LEADERSHIP

FIRST Robotics Team NRG 948 — Programming Lead — September 2018 - June 2021

- Taught Java, computer vision, and software development skills to a team of over 32 programmers.
- Utilized Agile Project Management and Azure DevOps to streamline internal communication.
- Performed repairs in the Pit Crew at competitions. Our FRC team placed Finalist in Worlds 2019.

EXTRACURRICULARS & AWARDS

- N1 Certificate Japanese-Language Proficiency (JLPT)
- Japanese National Special Award of Japanese Calligraphy (2021)
- Hobbies: 16 years practicing Piano & Japanese Calligraphy, 11 years Violin, 2 years Guitar