Seiya Kozakai

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ACADEMICS

University of Michigan Ann-Arbor GPA: 3.64/4.0
M.S.E. Electrical & Computer Engineering Expected May 2025
B.S.E. Computer Engineering May 2024

Languages English (native), Japanese (native), Chinese (intermediate)
Technical Languages C, C++, MATLAB, Python, Rust, Julia, Java, JavaScript, Verilog
Tools & Frameworks ARMv8 (AArch64), x86_64, 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, as well as a vertical-line array to detect ships and submarines.
- Developed a novel custom API binding C++ Libraries and algorithms with Python data readers.
- Translated prototype algorithms, such as Least Squares Target Motion Analysis (LSTMA) and Automatic Target Recognition (ATR) from MATLAB code into computationally-efficient C++ algorithms.
- 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

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.

Spatial Sound Synthesis — *Python, Jupyter Notebook, DSP, Filter Design* **January 2023 – April 2023**

- Implemented algorithms and experimentation to create spatial/binaural sound reproduction using spherical harmonic analysis, interaural time/level difference, and digital filter design.
- Empirically modeled room response to predict sound direction and create a personalized binaural sound.

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: 15 years practicing Piano & Japanese Calligraphy, 10 years Violin, 1 year Electric Guitar