Alex Parisi
Software Engineer
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Work Experience

Xander
Senior Software Engineer   *Remote*
                                                                                   Nov. 2023 - Present

- Lead developer at a startup creating AR smart glasses for real-time multilingual captioning with a C++ backend, Dart/Flutter frontend, and Microsoft Azure integration for cloud processing.
- Led the implementation of features and optimizations that reduced word-error-rate by 8% and device temperature by 5°C, enabling direct-to-consumer pre-orders, expanding partnerships, and securing $3.2M in Series B funding.
- Managed a team to develop a mobile app in Flutter, from requirements and UI/UX design to deployment on the Apple App Store and Google Play Store, including a custom BLE communication protocol and GATT service.
- Presented the capabilities of the product to thousands of attendants of the Consumer Electronics Show (CES) in Las Vegas, resulting in us being honored with the 2024 Innovation Award and featured on the TODAY Show.

Mikucare
Digital Signal Processing (DSP) Software Engineer   *Woodbridge, NJ / Hybrid*
                                                                                   Mar. 2022 – Nov. 2023

- Member of a team of engineers that developed and maintained C++17 embedded software for a smart baby monitor.
- Led the development of new algorithm features utilizing sensor fusion and computer vision techniques to identify the sleep, respiration, and movement patterns of over 30,000 infants in a fast-paced startup environment.
- Designed a multi-threaded analysis model that processed over 45,000 hours of customer data, verified algorithm performance, and evaluated the statistics of the radar and camera sensors for the development of new features.

Peraton Labs
Software Engineer   *Picatinny Arsenal, NJ / Hybrid*
                                                                                   Nov. 2019 – Mar. 2022

- Member of an Agile team of engineers developing and maintaining the real-time object tracking and trajectory estimation software for a Counter-Unmanned-Aircraft-System (C-UAS) program at the US Army CCDC-AC: Weapons and Software Engineering Center in C++17. Maintained Secret security clearance.

Crestron Electronics
Firmware Engineer   *Rockleigh, NJ*
                                                                                   Jan. 2018 – Nov. 2019

- Developed C firmware for SHARC DSP's, implementing audio processing algorithms like line/acoustic echo cancellation, delay-and-sum beamformers, and fixed/adaptive filter design for new Unified Communications (UC) products.

Skills

Programming	C++, Python, Dart, MATLAB, C, Kotlin, Java, HTML & CSS
Software & Packages	Flutter, CMake, Docker, Xcode, GitHub Actions, NewRelic, Firebase, TensorFlow/Keras, PyTorch, C++ STL, numpy, scipy, pandas
General	Microsoft Azure, AWS, Google Cloud Platform, Git/GitHub, Figma, Windows/Mac/Linux

Education

Georgia Institute of Technology, M.S.   Atlanta, GA
Electrical and Computer Engineering   2016 – 2017

Manhattan College, B.S.   Bronx, NY
Computer Engineering, Minor in Mathematics   2012 - 2016

Patents

Adaptive beamforming microphone metadata transmission to coordinate acoustic echo cancellation in an audio-conferencing system

- (US10854216B2) Using the geometrical metadata of individually beamformed microphones to coordinate a multi-channel adaptive echo canceller (AEC)

Projects

Professional

Xander – *XanderGlasses*

- Led an optimization investigation that improved search algorithms, simplified overcomplicated functions, and fixed all memory leaks. Optimized performance of the embedded speech-to-text model by reducing unnecessary evaluations.
- Interacted with Microsoft Azure and the Microsoft Speech SDK to implement over 100 languages into the product, as well as enabling translation when connected via cloud.

Xander – *Xander Phone App (iOS and Android)*

- Proposed and led a team to implement a companion phone app for the *XanderGlasses* product, enabling device control via Bluetooth-Low-Energy (BLE). Uses the Flutter framework to target multiple platforms, and Git is used for CI/CD to automatically build, sign, and deploy updates to each platform and App Store.

Mikucare – *Miku Smart Baby Monitor*

- Developed and implemented an improved motion detection algorithm, first in Python and then in C++ using OpenCV, significantly reducing the rate of false positives by combining the results from the radar and camera sensors.
- Improved the breathing detection algorithm using over a terabyte of collected radar data to tune the frequency analysis

Peraton Labs – *Classified Projects (Secret clearance)*

- Electrical Engineering analyst and Software Engineer for multiple Counter-Unmanned-Aircraft-System (CUAS) projects involving the automated tracking and elimination of malicious drones using a high-powered radar and proprietary weapons system, as well as a projectile-redirection mission that intermixed radio communication and radar tracking

Crestron Electronics – *UC-SB1-CAM UC Video Conference Smart Soundbar and Camera*

- Modeled algorithms and product design feasibility in MATLAB and participated in the full cycle of product development for the UC-SB1-CAM soundbar, one of Crestron's best-selling products in 2020
- Developed firmware for XMOS SoC systems to facilitate proper microphone tuning and beamforming performance, and tuned algorithms in a laboratory environment

Personal

dibiff – *Digital Biquad Filters in Float*

- Developed a real-time audio processing library in C++17 that contains a collection of simple and advanced Digital Signal Processing (DSP) elements which can be processed in a multi-threaded directed graph using modern C++ principles
- Precision and timing were carefully monitored and managed to ensure low-latency and high-throughput for easy integration into any environment.
- CMake is used for build configuration, and the Eigen library is used for vector math and Single-Instruction-Multiple-Data (SIMD) operations

flap – *Flexible Layout Audio Playground*

- Implemented a GUI companion in C++17 for *dibiff* using OpenGL to allow for multiplatform targets, GLFW for window management, CMake for build configuration, and ImGui for GUI bootstrapping.
- This tool allows the user to design an audio graph of interconnected audio objects, each operating on a block of sampled audio, in a drag-and-drop environment.

OpenGL Renderer

- Designed and implemented a fast and scalable renderer in C++17 for 3D models with OpenGL, using GLFW for window management, CMake for build configuration, and the OpenGL Mathematics library (GLM) for vector math and matrix transformations

Personal Website – *Deployed via Django*

- Deployed my personal website using the Django web framework with page information dynamically pulled from an SQLite database, hosted on Heroku. HTML and CSS implemented via Bootstrap.

Personal Website – *WebGL Renderer*

- Deployed my personal website using a static webpage, implementing a WebGL container in JavaScript that simulates and renders a Brownian Motion model on the GPU. HTML and CSS implemented via Bootstrap.