Kenny Peng

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Blog: www.kennypeng.com

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Education

BS, Electrical & Computer Engineering, May 2023

University of Southern California, 3.93 GPA

Core competencies

Applied digital signal processing (FFTs, CMSIS-DSP, SciPy, NumPy, Numba)

Concurrent programming (Zephyr RTOS, asyncio)

Scripting/Automation (Bash, Python, GNU Make)

Working knowledge

AI inference (PyTorch, ONNX, OpenCV)

Multimedia (GStreamer, WebRTC, FFmpeg)

Embedded Linux (Shell, Devicetrees, ALSA, systemd, SSH)

BLE (GATT/L2CAP, CTE, nRF52)

Programming languages

C, Python, Bash, C++

Interests

Building (grid-/particle-based) realtime fluid sims, psychoacoustics-based FFT processing, and manually grinding light-roast espresso

Work Experience

Embedded Systems Engineer Aug 2023 - Present
Vitalacy

- Conceived and built a power-spectrum-based dispense detection algorithm that reduced false positives by 80%+ and handled weak-signal edge cases, addressing multi-year client pain points with a firmware update
  - Reverse-engineered the accelerometer's signal processing; replaced wake-up logic, using sparse sampling to sense near the noise floor at 12 µA
  - Identified legacy config oversight that caused anti-aliasing filters to mask ~77% of the signal
  - Accelerated tuning by developing a custom Python evaluation toolkit and Zephyr-based firmware, streaming raw data segments over BLE GATT
- Architected core components of a successful beta deployment of an edge-AI virtual sitter at a hospital
  - Engineered a multi-object tracking pipeline to interpolate ~4 FPS inferences to 30 FPS on a Pi 4 CPU; rebuilt OpenCV's MedianFlow in C++/Numba with shared stages and Hungarian matching
  - Implemented two-way comms with one-way video, bridging WebRTC and GStreamer in Python (asyncio)
  - Integrated audio ICs with ALSA and Devicetree overlays; debugged hardware issues, including a speaker amplifier broken by PCB layout and MEMS microphones contaminated by PCB cleaning
- Maintained a hand hygiene monitoring system built with Zephyr and BLE on nRF52 microcontrollers
  - Extended battery life of a single-use badge device from 12 to 18 months while refactoring a sensor driver
- Built prototypes ahead of product decisions, including BLE Angle-of-Arrival on raw CTE IQ samples, FFT-accelerated Generalized Hough Transforms for detection, and depth-IMU fusion for floor segmentation and camera height estimation

Intern Jun 2022 - Aug 2022
Beryllium Ventures

- Solved an optimal play with future knowledge problem for rapid evaluation of different payouts systems

Projects

A Stable Fluids sim on an ESP32 microcontroller Sept 2025

- Accelerated pressure solver 100x by replacing Jacobi with SOR and computing the optimal spectral radius; implemented bilinear upscaling at 30 FPS by exploiting separability and strength reduction

An AI index of academic publications Present

- Built a command-line toolkit of composable operations to orchestrate a week-long compilation of a vector index of 95M abstracts in a cloud instance, including multi-GPU pipelines built in PyTorch