ISAIAH MURRAY

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Sophomore, Class of 2029 · U.S. Citizen · Embedded systems, instrumentation, and perception for physical hardware

Experience

Mar 2026 – Aug 2026 **FORMLABS – Electrical Engineering Intern — SLS & Materials R&D** **SOMERVILLE, MA**

- Built end-to-end powder-bed defect detection pipeline — GPU-accelerated classical CV region proposal feeding a ResNet-18 classifier over a nine-class taxonomy — replacing a binary detector with classified, severity-ranked results; surfaced order-of-magnitude defect-rate differences between machines running identical material
- Designed fleet-wide heater fault detection from first-principles physics after establishing no labeled fault data existed; root-caused a 9% false-positive rate to PWM phase jitter between hardware channels and restructured the check to 0% on healthy fleet data — caught a wiring fault on a unit 12 h from shipping to a beta customer
- Replaced a manual filter-swap characterization procedure with a controlled-evaporation sweep producing a continuous pressure–flow surface in one run; built the resulting virtual flow sensor and validated it closed-loop against an independent sensor outside the control loop
- Built in-situ dielectric cure monitoring rig (PyQt6, VISA impedance analyzer, SSH-triggered exposure); identified cross-machine timing as the data-quality limit and added a dedicated fire-time recorder, enabling ~40 Hz transient capture across 300+ runs. Correlated ionic viscosity with FTIR, enabling FTIR emulation at ~300 Hz
- Built browser-native lifetime test runner (acoustic cycle detection, crash-safe resumable state, automatic Word/PDF report generation) and ran five qualification campaigns — longest logged 515 insertion cycles

2024 – 2025 **CHERISH HEALTH – Engineering Team** **CAMBRIDGE, MA**

- Automated phased-array radar calibration; replaced manual gain/phase tuning with an FPGA-controlled workflow using spectrum analysis and algorithmic optimization, cutting calibration from hours to minutes and reducing side lobe interference 20% (TX) / 30% (RX)
- Built internal tooling for storing and comparing radar characterization data; accelerated state annotation throughput
- Sourced alternative LED supplier and coordinated contractors for molded fiber packaging, reducing BOM cost by 5%
- CAM'ed and manufactured injection-molded and machined components

May 2023 – Aug 2023 **MIT CHEM-E – STRANO GROUP, Laboratory Assistant** **CAMBRIDGE, MA**

- Selected for MIT's HIP-SAT summer research program (Strano Lab); investigated graphene nanostructure additives in octadecane-based phase change materials to improve thermal conductivity and raise thermal resonator output voltage
- Presented findings at HIP-SAT Symposium and Boston Mammalian Synthetic Biology Symposium

2022 – 2023 **CHERISH HEALTH – ML Intern** **CAMBRIDGE, MA**

- Trained detection models and built data collection tooling in Python/TensorFlow
- Ran technical demos for CEO and CTO supporting a successful Series A round

Additional Experience

- **Access Sport America** — Coach, Dorchester MA (2024–2025) · Adaptive watersports programming for athletes with disabilities; specialized in nonverbal autism support
- **Center for Student Coastal Research** — Student Researcher, Cohasset MA (2016–2022) · Won Marjot grant to study *Zostera marina*; built automated environment chamber testing recovery in *Labyrinthula zosterae*-infected specimens

Projects

- **Autonomous Swarm** *(in progress)* · Multi-vehicle autonomy stack (Isaac Sim, Pegasus, PX4 SITL, MAVSDK-Python); four-vehicle concurrent autonomous flight in sim, hardware build underway on an STM32H743 FC.
- **Olin Baja Racing** — Ride-height suspension sensor for damper tuning, CAN-based data acquisition & diagnostic canopy.
- **CLASP** — BLE proximity-logging wearable on Nordic nRF52: custom PCB across multiple revisions, low-power RF design.
- **Bragi** — Real-time Quest 3 XR perception pipeline: YOLOv5 detection driving contextual overlays, Google Cloud STT/TTS.
- **Binaric** — Acoustic data transmission protocol: layered modulation, Manchester-clocked multi-tone encoding, adaptive error correction.

Skills

Languages	**Python, C, C++, MATLAB, SQL, JavaScript**
ML / CV	**PyTorch, OpenCV, Kornia, scikit-learn, NumPy, Pandas, SciPy, Tensorflow**
Hardware & Instrumentation	**KiCad, Altium, PyVISA, USB DAQ, thermal imaging, nRF52, STM32, CAN, PX4/MAVLink**
Tools & Infrastructure	**BigQuery, Grafana, FastAPI, SQLite, Git, SolidWorks, Fusion 360, Blender, INAV, Docker, Linux**

Education

2025 - 2029 **FRANKLIN W. OLIN COLLEGE OF ENGINEERING** **NEEDHAM, MA**

B.S. Engineering, Electrical & Computer Engineering concentration · Expected May 2029 · GPA 3.75. Built a facial recognition program, compared epidemiology models, and applied biomimicry to weight-efficient jumping mechanisms through project-based coursework.

2020 - 2024 **NUVU INNOVATION SCHOOL – 8th - 12th Grades** **CAMBRIDGE, MA**

Project-based studios; Harvard Extension coursework in multivariable calculus, differential equations, linear algebra, CS50.

Interests

Rugby and MMA (Babson) · Babson Mazda Miata racing team · Classical guitar · Delta Tau Delta Alumni Chair