

Carson Pazdan

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PROFESSIONAL SUMMARY

Biomedical Engineer with hands-on experience designing and integrating electromechanical systems for implantable, wearable, and handheld medical devices, from SolidWorks CAD and DFM-driven enclosure design through analog signal acquisition, embedded firmware, and formal V&V testing. Comfortable moving between mechanical, electrical, and system-level work, translating user needs into design requirements, and communicating technical findings clearly to cross-functional teams.

EDUCATION

Duke University, Pratt School of Engineering | Durham, NC August 2022 – May 2026

B.S.E., Biomedical Engineering | Minor, Neuroscience | Innovation & Entrepreneurship Certificate | GPA: 3.75/4.0

- BME Design Fellows, Society of Biomedical Engineers, Pratt Dean's List
- Relevant Coursework: Medical Device Design, Embedded Systems, Bioelectricity, Biomechanics, Medical Instrumentation, Signals & Systems, Product Engineering

WORK EXPERIENCE

Beghou Consulting, Associate Consultant | Evanston, IL August 2026 – Present

- Analyze and structure large-scale commercial and clinical datasets, build data pipelines (Python, SQL), and translate technical analysis into clear reporting for pharmaceutical and biotech clients.
- Self-taught a clinical trial operating system used by a ~15-person team; synthesized scattered documentation into pipeline diagrams and data-structure spreadsheets to eliminate knowledge bottlenecks concentrated in 2–3 individuals.

Duke University, Teaching Assistant, MedTech Prototyping | Durham, NC January 2025 – May 2026

- Led design reviews and troubleshooting sessions for 20+ students' medical device prototypes, identifying mechanical and system-level integration issues during hardware bring-up.
- Mentored students in circuit assembly, ECAD/CAD (KiCAD, Onshape), SPICE simulation, and firmware development (C++, Python).

Duke University Viventi Lab, Research Assistant | Durham, NC September 2023 – August 2025

- Defined performance requirements and executed verification testing for implantable LCP sEEG electrode systems; optimized heat-press encapsulation parameters to eliminate voids seen on CT imaging, and helped establish saline soak testing that later showed <0.006% mass loss over 30 days.
- Designed and built a gravity-tensioned electrode-coiling fixture targeting sub-1 mm mandrels, reaching 5.55 ± 0.28 mm pitch on 1 mm tubing; conducted impedance testing and signal characterization.

Blur Product Development, Engineering Intern | Cary, NC May 2024 – August 2024

- Designed a production-intent, DFM-optimized enclosure for an at-home dry eye treatment device, from foam ergonomics mockups through 3D-printed prototypes; stacked tolerances between the CNC-machined tip and injection-molded housing to set mating dimensions.
- Built and automated a Python-based GUI application coordinating four USB-connected instruments (Modbus-controlled temperature chamber/reservoir, DAQ-driven pump/compressor, device data streaming) for unattended multi-day calibration trials; implemented multithreading and automatic outlier handling, reducing test time by 40%.

PROJECTS

Seizure Prediction Wearable (Auralert), Senior Design Team July 2025 – May 2026

- Defined system-level requirements and led verification testing across EEG acquisition, embedded processing, and BLE telemetry, integrating hardware, firmware, and cloud-based ML into one wearable; authored the project's Design History File, including test protocols, FMEA, and V&V documentation.
- Designed the rebiasing and power circuitry, custom PCB, battery-monitoring circuit, and drop-resistant back-mounted enclosure; validated EEG acquisition (eyes-open/closed alpha power, $p < 0.001$) and end-to-end classification on non-epileptic subjects (76.5% average interictal accuracy across four subjects and three movement conditions). Finalist, People's Choice Award.

Pacemaker Circuit January 2025 – May 2025

- Designed, built, and verified a VVI demand pacemaker (ECG acquisition, R-wave detection, pacing firmware, MOSFET stimulation stage) with BLE telemetry; validated stimulus width within 1.4% of a physiologically derived target and ~13 ms average wireless reporting latency.

TECHNICAL SKILLS

Mechanical Design & CAD: SolidWorks, Onshape, tolerance stack-up analysis, DFM/DFA, 3D printing, CNC machining, waterjet/laser cutting

Electrical & Embedded: Analog circuit & active filter design, PCB design & layout (KiCAD), SPICE, firmware (C/C++, Zephyr RTOS), BLE, DAQ systems (Modbus RTU/pymodbus), oscilloscope-based testing

Systems & Design Control: Requirements definition, V&V test planning & execution, FMEA/RPN risk analysis, DHF authorship, deviation investigation, cross-functional design reviews

Programming & Data: Python, SQL, C/C++, MATLAB