LAUNCHCLOUD LABS

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Position Description: Biomedical Engineering Intern – R&D Technician

Project: FirstLight | EventHorizon (FLEH)
Company: LaunchCloud Labs (LCL)
Location: Remote / Distributed (Viera East, Florida HQ)

I. Corporate Overview & Mission

LaunchCloud Labs is a vertically integrated technology holding company and R&D laboratory specializing in the "Cloud to Chip" lifecycle. We engineer integrated systems bridging edge-compute hardware, artificial intelligence, and enterprise software platforms.

Our flagship medical device, **FirstLight | EventHorizon (FLEH)**, is a medical-grade EMS recording and real-time triage intelligence system designed for ambulances. Operating as a clinical "Black Box," it captures pre-hospital audio, video, and biometric data, utilizing on-device AI (DeepGram ASR and in-house ensemble LLMs) to generate structured medical narratives. FLEH is officially approved for integration into the Epic Electronic Health Record (EHR) system via SMART on FHIR protocols.

II. Role Objective & Learning Outcomes

The Biomedical Engineering R&D Technician will serve as a core contributor to the physical and logical prototyping of the FLEH edge device. Reporting directly to the Lead Technologist, the intern will bridge the gap between raw hardware sensor data (audio, GPS, biometrics) and structured clinical output.

Primary Learning Outcomes: The intern will gain applied experience in clinical engineering principles, ensuring the device captures data reliably in high-vibration ambulance environments, interfaces directly with hospital systems for trial runs, and guarantees data outputs strictly adhere to clinical interoperability standards (HL7/FHIR).

III. Core Responsibilities

- **Hardware-to-Clinical Integration:** Assist in prototyping the dual-processor architecture utilizing the NVIDIA Jetson Orin Nano (Edge Compute) and ESP32 (Real-Time Controller). Focus on optimizing sensor inputs—specifically the 4-mic electret/MEMS arrays and visual context cameras—for clinical accuracy in noisy, high-stress environments.
- **Medical NLP & Sensor QA:** Collaborate with the in-house AI engine to test and refine the prompt logic used for extracting critical triage data (e.g., Glasgow Coma Scale, vital signs, mechanism of injury, medication administered) from chaotic EMS audio. Feed other sensor data and voice directionality metrics back into the AI to improve diagnostic context.
- **FDA Design Controls & Quality Management:** Assist in maintaining Design History Files (DHFs) and executing Verification & Validation (V&V) protocols in alignment with FDA design controls (21 CFR 820.30) for medical devices.
- **HIPAA & Data Security:** Enforce strict patient data privacy standards during development and field tests, ensuring the proper implementation of full-disk encryption (LUKS) on NVMe SSDs and secure data wiping protocols.
- **Hospital Trial Liaison:** Deal directly with partner hospitals to set up devices for pilot programs. Act as a technical point of contact to establish trial runs, monitor system performance in the field, and gather clinical feedback.
- **Cross-Disciplinary Collaboration:** Work closely alongside other engineering disciplines (Computer Science, Electrical Engineering) to ensure seamless integration between hardware components, firmware, and cloud software.
- **General R&D Duties:** Perform a variety of other duties and technical tasks as assigned by the Lead Technologist to support the broader goals of the laboratory.

IV. Technical Profile & Requirements

- **Academic Standing:** Currently enrolled in a Biomedical Engineering university program (Florida Institute of Technology).
- **The "Fixer" Mindset:** Demonstrated ability to independently troubleshoot complex technical problems. We require autodidactic builders who utilize modern AI tools as force multipliers to generate and debug logic.
- **Hardware/Software Literacy:** Familiarity with microcontrollers (ESP32) and edge Linux environments (NVIDIA Jetson/Ubuntu).
- **Clinical Context:** Understanding of pre-hospital emergency care workflows, medical terminology, and basic EHR interoperability (SMART on FHIR experience is a major differentiator).
- **In-House Philosophy:** A preference for building sovereign, self-hosted solutions over relying on third-party SaaS dependencies.

V. Academic Supervision, Evaluation, and Deliverables

This internship is designed to satisfy university practicum/capstone requirements. LaunchCloud Labs will coordinate directly with university faculty to ensure all academic criteria are met.

- **Supervision & Mentorship:** The intern will report directly to a designated Lead Technologist who will provide ongoing technical mentorship, project oversight, and career guidance.

- **Mid-Term & Final Clinical Engineering Report:** The intern will author a comprehensive technical report detailing their specific contributions to the FLEH device, focusing on hardware-sensor integration, Medical NLP prompt refinement, and FHIR interoperability.
- **Structured Performance Evaluations:** In accordance with LCL's internship protocols, the intern will participate in a formal mid-term check-in and a comprehensive final assessment covering technical skill development, project progress, problem-solving, and overall impact.
- **Verifiable Activity Logs:** LCL will provide exportable, cryptographically stamped time and task logs via our internal operations portal to satisfy the university's required practicum hour tracking.

VI. Equal Opportunity & Compliance

LaunchCloud Labs is committed to fostering an inclusive, safe, and harassment-free workplace. We provide equal internship opportunities to all applicants without regard to race, color, religion, sex, national origin, age, disability, or genetics. All R&D activities are conducted in strict accordance with remote workplace safety and digital compliance standards.
