

BUSINESS TYPE Single-member LLC (RI), Small Business	LOCATION North Kingstown, RI (Newport / Quonset)	POINT OF CONTACT Gregory Chaber, Founder & Principal	NAICS 541715, 541330, 541512, 334511
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UEI pending (SAM.gov in process)	CAGE pending	PRIMARY NAICS 541715 (R&D, Eng.)	STATUS U.S. citizen; clearance-eligible

WHO WE ARE

Chaber Labs is a Rhode Island technology company that builds systems you can verify. When one of our systems gives an answer or drives a control loop, you should be able to trust that result and check how it was reached. The work runs **from the sensor to the decision**: we instrument the physical world, run it on real-time embedded firmware with precise timing, move the data securely across edge and cloud, and turn it into AI and analytics that hold up to scrutiny. That same emphasis on verification lines up with NUWC Newport's priorities in explainable AI, secure pipelines, and deterministic timing. The work divides into two pillars that reinforce each other.

CORE COMPETENCIES

Pillar 1: Trustworthy AI / ML - Citation-faithful, hallucination-resistant retrieval-augmented generation (RAG) - Explainable AI (XAI), evaluation harnesses, and correctness red-teaming - On-prem and air-gap-friendly open-weight LLM deployment, plus QLoRA fine-tuning - Production generative-AI agents (tool-use / MCP) and SQL-over-data-lake analytics - Data engineering on AWS: ETL and streaming pipelines, data lakehouse and warehousing, cataloging and governance, infrastructure-as-code, secure multi-account	Pillar 2: Embedded & Electronic Systems - Electrical engineering: schematic capture, PCB design and prototyping, mixed-signal - Semiconductor and ATE test engineering, device characterization, bench instrumentation - Embedded firmware: ARM in C, bare-metal and Assembly (x86, ARM, AVR), real-time control - Power electronics: GaN power stages and grid-forming control loops - Deterministic networking and timing: custom L2 IEEE-1588 PTP, CAN, Modbus - Edge-to-cloud IoT, from device to firmware to secure connectivity to the cloud
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DIFFERENTIATORS

- Full-stack in one contractor.** From board bring-up and firmware through cloud to trustworthy AI. That range is unusual to find in a single person.
- Verification-first habit.** Citation-faithful AI and test-driven hardware. The aim is to show the evidence, not just the output.
- Local** to NUWC Newport and the Quonset defense-industrial base.
- Active self-funded R&D** behind the hardware pillar: a modular power-electronics project with device-level SPICE design and real-time grid-forming control firmware on a development board, with custom IEEE-1588 time-sync in progress. Honest work in progress that keeps the skills sharp, not a fielded product.

REPRESENTATIVE EXPERIENCE

More than ten years designing and building software and electronic systems, including:

- Consumer-robotics IoT cloud on AWS at large scale (10 to 20 million concurrent connected devices) as development lead, under GDPR and CCPA.
- Connected medical devices: BLE firmware and a mobile companion app, with HIPAA and PHI handling, including technical oversight of an outside EE contractor (schematic and BOM review).
- Structural and seismic sensing: an AWS IoT backend for sensor-data collection.
- Industrial test automation (independent consulting): CAN, Modbus, and Protocol Buffers driving a 2-axis gantry and a rotation table, with embedded ARM in C and EE prototyping.
- Analog and mixed-signal semiconductor test engineering.
- Current work: production data engineering and generative-AI analytics (ETL and streaming pipelines, a cloud data lakehouse, plus an agentic tool-use layer over curated data for natural-language analytics).

ALIGNMENT TO NUWC NEWPORT CAPABILITY FOCUS AREAS

To be straight about scope: Pillar 1 (AI/ML and data engineering) is production-grade, while the hardware, power, and timing items reflect degreed-EE capability and active self-funded R&D rather than fielded systems.

FOCUS AREA	RELEVANT NUWC SUBTOPICS	CHABER LABS CAPABILITY
Digitization	Agentic and resilient AI, edge learning, AI explainability (XAI), defense against adversarial attacks and misinformation, human-AI teaming, digital thread, cloud and edge computing	Citation-faithful, hallucination- and misinformation-resistant RAG; XAI and evaluation harnesses; agentic tool-use; and the digital-thread data layer (ETL and streaming, lakehouse, cataloging and governance). Production-grade.
Cybersecurity	Generative AI to aid operator incident response, AI/ML host and network recognition, DevSecOps and CMMC-compliant pipelines, zero-trust, operator-friendly interfaces	Auditable generative-AI assistants for incident response; secure multi-account IaC and DevSecOps practices aligned toward CMMC-style pipelines; on-prem and air-gap-friendly open-weight deployment for sensitive data.
Undersea Sensing	AI-enabled signal classification, low-power signal processing, low-noise electrical sensors, low-SWaP telemetry and out-board electronics	ML signal classification (Pillar 1); mixed-signal, ADC front-end, and instrumentation background from semiconductor test; low-power embedded signal processing.
Undersea Robotic & Autonomous Systems	AI-enabled autonomy and mission planning, system-level power management and low-SWaP, precision navigation and timing (PNT), modular embedded payloads	AI/ML autonomy software (Pillar 1); power-electronics and power-management R&D; real-time embedded control; IEEE-1588 PTP precise timing (R&D).
Assured Communications	Embedded DSP and small-form-factor comms, compression and encryption for low-rate high-latency links, synchronization across distributed nodes	Embedded firmware and DSP; deterministic networking and IEEE-1588 PTP time-sync (R&D); CAN and Modbus distributed-node experience.

CREDENTIALS

- B.S. in Electrical Engineering, University of Massachusetts Lowell
- U.S. citizen, eligible for a clearance (none currently held)
- More than ten years of hands-on software and electronics experience