

ANDREW ROOT

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SUMMARY

Founding engineer who deployed an AI system into 2 customer offices, with 10 edge devices running across 5 rooms today. I own my work from design and development through installation, collaborating with the people who use it, and handling ongoing maintenance. I work across the stack and move the needle instead of waiting for my next assignment.

TECHNICAL SKILLS

Languages	Python, C, SQL, TypeScript/JavaScript
AI & Inference	Speech-to-text, LLM APIs, multimodal inference pipelines, PyTorch, OpenCV, Scikit
Infra & Other	AWS (CDK, CloudWatch, SNS, SageMaker), Linux, Git/GitHub, logging & alerting, technical writing (deployment guides), fleet management
Real-Time & Sensors	Machine vision cameras (See3CAM 24CUG), hardware triggering & frame synchronization, Pico 2W firmware, edge inference on Orange Pi 5B

PROFESSIONAL EXPERIENCE

Founding Engineer | *Daentra (early-stage startup)* | San Francisco, CA 08/25 - Present

- Designed, developed, and deployed a real-time vision/audio system into dental operatory rooms, where it runs unattended during live patient treatment; currently handling 10-20 appointments a day.
- Built an agentic inference pipeline on AWS that turns operatory audio and video into procedure predictions for insurance claims, combining STT with LLM calls constrained to structured output so every step stays machine-parseable.
- Synchronized a machine vision camera to a dental light, replacing an unusable, color-cycling video feed with a stable one, removing the need for an expensive camera ([article](#)).
- Working closely with hardware, I optimized our edge devices to stream 1200p video at 55 FPS on a single CPU core, offloading RetinaFace to the NPU and video encode/decode to the VPU, and created a custom UVC kernel module to increase the buffer capacity.
- Researched and prototyped depth and pose estimation methods for key-object tracking in video, evaluating state-of-the-art models and custom solutions (PyTorch, OpenCV, Open3D).

Research Lab Assistant | *Oakland University* | Rochester Hills, MI 05/24 - 05/25

- Developed a real-time computer vision pipeline (Python, PyTorch, OpenCV) that segments expected objects from live video for an automated security vehicle, built and evaluated with master's and PhD students, in collaboration with Dataspeed Inc.

Undergraduate Researcher | *University of Wisconsin Eau Claire* | Eau Claire, WI 09/23 - 12/24

- Quantified how far cyberbullying-detection models degrade on data they were never trained on, running cross-dataset evaluations (SciKit, XGBoost) on the university's Linux HPC cluster to isolate sources of dataset bias; mentored junior researchers in the research group.

Software Engineer Intern | *Midwest Manufacturing (Menards Inc.)* | Eau Claire, WI 05/23 - 05/24

- Put advanced SQL database operations in the hands of non-technical teams by shipping a full-stack web application.
- Refactored 3 production manufacturing services integrating PLC control systems and message brokers.
- Prototyped a service that auto-generates Confluence documentation from code repositories via web scraping and syntax parsing.

PROJECTS & LEADERSHIP

Tether  | Published a Python CLI that catches documentation drifting away from the code it describes, fingerprinting both ends with git blob OIDs to flag drift at the function or section level. Built for coding agents, it ships Claude Code hooks and an onboarding skill.

Voice-Assistant Task Manager  | Built a real-time voice agent on LiveKit that streams audio to a Python agent, transcribes it, resolves intent with an LLM, and executes the matching database operations.

President – Students' Association for Computing Machinery | Led my university's ACM chapter, running hands-on sessions for Python, Git/GitHub, and neural networks. Chaired board meetings and delegated responsibilities to board members.

EDUCATION

B.S. Computer Science & Applied Math (Double Major) | UW Eau Claire (3.98/4.0), Honors 09/22 - 12/24