

Jeremy Burke

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Professional Summary

Applied AI and software engineer delivering defense and aerospace R&D software across SBIR/STTR programs. Experienced in computer vision, sensor fusion, simulation, RAG systems, LLM tooling, backend APIs, and technical automation. Builds practical software systems that connect AI models, engineering data, and usable interfaces across \$100K-\$1M+ efforts.

Experience

Computer Engineer — Beacon Industries — Newington, CT

Aug 2025 – Present

- Led SBIR/STTR technical programs across DoD, NASA, and MDA efforts, delivering reports, software prototypes, simulations, and technical analyses valued at \$30K-\$250K+ independently
- Developed computer vision models, synthetic sensor pipelines, and fusion-validation workflows for perception and multi-spectral detection programs
- Engineered custom plugins and simulation tools for thermal, environmental, and multi-spectral sensor modeling from raw data streams
- Built AI-enabled internal tools using AWS, Weaviate, OpenAI APIs, and custom automation pipelines for technical analysis and decision support
- Presented technical work, R&D outcomes, and commercialization opportunities to government stakeholders

Selected R&D Projects

Multi-Spectral Passive Object Detection — Navy SBIR

- Built ML-based object-detection pipeline using synthetic and real multi-spectral data; developed 3D physics simulations and sensor plugins for environmental modeling and fusion testing

Hypersonic Kill Vehicle Research — MDA SBIR

- Performed ANSYS simulations to evaluate high-speed system performance, design tradeoffs, and mission-relevant operating conditions

Additive Manufacturing R&D — SBIR Phase II

- Delivered \$500K in technical milestones and coordinated external research collaboration for advanced manufacturing development

Reverse Engineering — Defense System

- Leading vendor coordination and technical analysis for legacy electromechanical system reconstruction

Personal Projects

ProjectPulse API

- Built a production-style project-management API using ASP.NET Core 8, C#, EF Core, Clean Architecture, MediatR/CQRS, FluentValidation, Swagger/OpenAPI, Docker Compose, xUnit, and GitHub Actions CI
- Implemented domain rules, audit logging, seeded demo data, unit/integration tests, and local one-command setup

Technical Paper AI Search Assistant

- Built a local RAG-style technical paper assistant using Next.js, FastAPI, Chroma, BM25, PyMuPDF, sentence-transformers, and Ollama
- Implemented PDF upload, local index rebuild, hybrid vector/keyword retrieval, local answer generation, and document/page-level source traceability

Open Computer Vision Detection Dashboard

- Built a Next.js/TypeScript dashboard for visualizing YOLOv8 object-detection results on public urban-scene images
- Rendered bounding boxes, confidence scores, class summaries, detection tables, and static JSON model-output workflows

Education

University of Connecticut — Storrs, CT

Aug 2019 – Dec 2023

B.S. Computer Science & Engineering, Minor Mathematics

GPA: 3.3

Technical Skills

Programming: Python, TypeScript, JavaScript, C, C++, C#, Java, SQL

AI/ML: Computer Vision, YOLOv8, RAG, Sentence Transformers, Multimodal Fusion, LLM Systems

Web/Backend: Next.js, React, FastAPI, ASP.NET Core 8, EF Core, REST APIs, Swagger/OpenAPI

Data/Search: Chroma, BM25, Weaviate, PyMuPDF, Vector Search, Hybrid Retrieval

Simulation: Gazebo, ANSYS Workbench, MATLAB, Magics, Physics-Based Modeling

Cloud/Tools: AWS, Docker, GitHub Actions, OpenAI API, Ollama, Linux, Git, LaTeX