Jeffrey Hoelzel Jr

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Software Engineer, AI and Full Stack Systems

Software Engineer with experience building AI powered backend systems, machine learning pipelines, and full stack applications across healthcare, research, and data platforms. Delivered measurable improvements in retrieval accuracy, runtime, API efficiency, scraping throughput, and search infrastructure.

Education

Northern Arizona University, Flagstaff, AZ **GPA: 3.86**

B.S. in Software Engineering | Minor in Mathematics Dean's List

Awards: Outstanding Senior Award | Keim Undergraduate Research Excellence Award, Honorable Mention | HURA Grant Recipient

Work Experience

Software Engineer Intern | Altored Health | Flagstaff, AZ **Jan 2026 - Present**

- Architected semantic retrieval workflows using pgvector and Meilisearch to match ambiguous patient queries with structured healthcare visit targets.
- Implemented confidence-gated LLM fallback logic with strict JSON outputs, increasing correct target selection from 67% to 98%.
- Dockerized backend services and search infrastructure to support local development, deployment testing, and scalable API orchestration.

Machine Learning Engineer | Pathogen and Microbiome Institute | Flagstaff, AZ **Aug 2025 - Present**

- Developed PepSeqPred, a PyTorch-based machine learning (ML) pipeline to predict antibody epitope locations across diverse pathogens.
- Optimized ESM-2 embedding generation pipelines using batching and SLURM GPU parallelization, reducing high-performance compute (HPC) runtime by over 50%.
- Built logging and evaluation tools using PR AUC, recall, precision, F1, and confusion matrices to validate model performance under extreme class imbalance.

Software Engineer, Data Systems | NAU SICCS | Flagstaff, AZ **Jan 2025 - Present**

- Engineered Python-based web scrapers with Selenium and BeautifulSoup to extract unstructured UltraSignUp trail race data for downstream statistical analysis.
- Improved scraping throughput by nearly 90% via concurrency and adaptive wait time strategies.
- Reduced OpenStreetMap API calls by 48.5% through dynamic GPX coordinate batching.

Information Technology Intern | Cavco Industries, Inc. | Phoenix, AZ **Jun 2025 - Aug 2025**

- Built agentic LLM workflows to classify, route, and update ServiceDesk Plus ticket operations through automated tool calls.
- Designed a retrieval-augmented generation (RAG) pipeline, reducing response latency by 60% and consolidating 3+ API calls into 1 request.
- Developed an ML pipeline clustering 100,000+ tickets to automatically generate Confluence knowledge articles.

Projects

ArtemiS3 | Capstone Project (USGS and NASA) **Svelte | FastAPI | PostgreSQL | Boto3 | Meilisearch**

- Architected a Dockerized search platform enabling discovery across public NASA and USGS AWS S3 datasets.
- Built REST API endpoints with FastAPI and optimized queries using Meilisearch and Boto3.
- Led technical planning and stakeholder presentations, delivering architecture, feasibility, and requirements documentation.

Louie's Ratings | Software Engineering (CS386) **React | Flask | PostgreSQL**

- Led a five-person team through sprint planning and delivery of a full-stack academic rating and grade insights platform.
- Developed secure authentication flows using React and Flask with bcrypt password hashing.

Technical Skills

Languages: Python, TypeScript, JavaScript, SQL, C/C++, Java, HTML, CSS

Libraries/Frameworks: React, Svelte, Node.js, FastAPI, PyTorch, Scikit-Learn, Pandas, NumPy

Databases/Search: PostgreSQL, pgvector, SQLite, Firebase Firestore, Meilisearch

Developer Tools: Docker, Docker Compose, Git, SLURM, AWS, Azure, NGINX, Codex, AI assisted development, CI/CD, Agile