

Mitchel Carson

Austin, TX · (980) 254-3365 · Active TS/SCI
mitchel.carson@gmail.com · mitchelcarson.com
linkedin.com/in/mitchelcarson · github.com/Mitchel134

Software Engineer | Applied AI & Scientific Computing

SUMMARY

Software engineer and UT Austin M.S. Artificial Intelligence student (4.0 GPA) with Java/Spring Boot experience at USAA and HYDRA forecasting research. Chose to pursue AI while serving as an Executive Missions Aviator in the United States Air Force. Focused on applied AI that makes complex data useful to the people relying on it.

PROFESSIONAL EXPERIENCE

USAA · Software Engineering Intern · San Antonio, TX May 2025 - August 2025

- Built Java and Spring Boot GraphQL APIs for customer-data workflows used across enterprise channels.
- Reduced troubleshooting time by 30% through API enhancements and JavaScript comparison views integrating name and employment data from multiple sources.

United States Air Force · Executive Missions Aviator August 2020 - April 2023

- Flew on 50+ executive airlift missions across 30+ countries, all completed with zero safety-related incidents.
- Worked directly onboard with distinguished visitors including the Vice President aboard Air Force Two and the Secretary of State; managed passenger safety and logistics with flight crews, security teams, and White House staff.
- Handled in-flight meal and beverage service, baggage logistics, crew hotel bookings and ground transportation, visa applications, and crew and passenger subsistence billing.
- Served in the 89th Airlift Wing, whose executive airlift mission supported the Vice President, First Lady, Secretaries of State and Defense, and Chairman of the Joint Chiefs of Staff.

RESEARCH AND SELECTED PROJECTS

HYDRA · Watershed Forecasting Research 2025 - present

ONGOING RESEARCH · RESULTS PENDING

- Developing HYDRA to study watershed dynamics and forecast reliability, motivated by experiencing Hurricane Helene in Boone.
- Built NextGen reforecast generation software and Google Cloud workflows to acquire, validate, and align weather, streamflow, and forecast data with traceable provenance.
- Designing forecast post-processing for 1-18 hour lead times, with comparisons of LSTM, Transformer, and Mamba-style models on identical inputs and splits.
- Evaluating with leakage-aware temporal splits and hydrologic metrics (RMSE, NSE, KGE), reporting performance by site and lead time.

Public code: github.com/Mitchel134/NextGen_Hydra

Harmony · Automated Decision System with Bounded LLM Autonomy 2025 - present

ACTIVE DEVELOPMENT

- Built a financial decision pipeline in Python, scikit-learn, SQLite, and React using an explicit state graph, declared action paths, and tamper-evident logging of each step.
- Confined LLM research and analysis to advisory nodes that can flag or veto but cannot execute; architecture requires human approval for each consequential action.
- Designed an isolated AWS environment for reproducible CPU/GPU research experiments, with local tools to control runs and review results.

CONFERENCE ACTIVITIES AND MANUSCRIPTS

Accepted: Scientific workshop facilitator, *Best Practices for AI and Agentic Workflows in Earth Science Research*. AGU26, San Francisco, December 7-11, 2026.

Under review: HYDRA streamflow forecasting abstract, AGU26, session H100 (machine learning in hydrology).

In preparation: HYDRA results manuscript for *Water Resources Research* (target journal).

Planned: Software paper on the NextGen reforecast generation software for *Environmental Modelling & Software* (target journal).

EDUCATION

M.S. Artificial Intelligence

Expected May 2027

The University of Texas at Austin

GPA: 4.0/4.0. Completed: Machine Learning, Deep Learning, Reinforcement Learning, AI Ethics.

B.S. Computer Science

December 2025

Appalachian State University

Cum Laude; GPA: 3.6/4.0. Data Science Certificate. Senior honors thesis on runoff forecasting with deep learning.

TECHNICAL SKILLS

LANGUAGES

Java; Python; JavaScript/TypeScript; SQL; C; C++; Assembly; Swift; R

BACKEND AND WEB

HTML/CSS; Spring Boot; GraphQL; FastAPI; React; Next.js; Node.js; Tailwind CSS

ML AND DATA

PyTorch; MLX; scikit-learn; pandas; NumPy; xarray; PyArrow; PostgreSQL; SQLite

CLOUD AND TOOLS

Google Cloud (BigQuery, Cloud Storage); AWS research compute; Docker; Git; pytest; Jira