DAVID J. BRAUN

AI & AUTONOMOUS SYSTEMS RESEARCH CV

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PROFESSIONAL SUMMARY

M.S. Artificial Intelligence candidate investigating fault injection, reproducible autonomous-system evaluation, and evidence-grounded diagnosis. Research background includes low-resource information retrieval, geoscience/space-physics analysis, and large-scale data processing. UAV diagnostic results remain under evaluation.

TECHNICAL SKILLS

Research Methods: Simulation, fault injection, telemetry quality control, reproducibility, retrieval evaluation, FFT/spectrograms, experimental baselines

Software & Data: Python, SQL, PX4, Gazebo, MAVSDK, Parquet, RAG/retrieval, BigQuery, IDL (historical)

Engineering: AWS, Docker, Kubernetes, Git, Linux, APIs, CI/CD, TypeScript/React

PROFESSIONAL & RESEARCH EXPERIENCE

Graduate Research Assistant | University of St. Thomas | PTE — Sep 2026 - Present

ECE / SCALE | Prof. Hassan A. Salamy

- Designed and exercised a single-X500 PX4/Gazebo software-in-the-loop harness for automated missions, injected faults, quality-gated telemetry, and provenance-verified artifacts.
- Collected 30 initial steady-wind trials (6 controls, 24 fault injections; 29 protocol-valid); diagnostic accuracy has not yet been evaluated.

Founder & Principal Software Engineer | People's Connection LLC | Self-employed — Jun 2020 - Present

Concurrent independent consulting | Minnesota / Remote

- Designed and delivered applications, cloud deployments, security automation, and web systems for nonprofit and client use.
- Operate the production VIFG website on AWS Lightsail with Docker/Nginx, automated deployment and accessibility validation.

Graduate Tutor / Computer Systems Support | U. of St. Thomas | PTE — Dec 2025 - Present

Software Engineering & Data Science | Saint Paul, MN

- Provide graduate tutoring and technical support in software-engineering coursework and systems.

Systems Engineer | U.S. Bank | Contract — Nov 2024 - Feb 2025

Minneapolis, MN (Remote)

- Diagnosed enterprise REST API integration problems and documented escalation workflows.

Infrastructure Engineer | Securian Financial | FTE — Oct 2022 - Mar 2024

Saint Paul, MN (Remote)

- Automated AWS provisioning and Java/Spring deployments in EKS/Kubernetes; reduced recurring manual Python processing effort by approximately 40%.

Cybersecurity Engineer | GE Aviation | Contract — Oct 2021 - Oct 2022

Cincinnati, OH (Remote)

- Improved Java/React application security and API controls using SAST/DAST, CSRF protection, OAuth2/JWT, and OpenShift.

Software Engineer | Target | Contract — Jun 2019 - Jun 2020

Minneapolis, MN

- Built React/Kotlin software and modernized build and dependency workflows across 50+ repositories.

Software Developer | Graphic Systems LLC — Jul 2018 - Nov 2018

Minneapolis, MN

- Maintained inventory/shipment applications and Four51 API batch-upload integration.

Space Physics Data Analyst / Intern | Augsburg University — May 2016 - Aug 2017

Research appointment | Minneapolis, MN

- Analyzed satellite and ground-magnetometer observations in IDL/Python; generated FFT-based plots and spectrograms supporting collaborative publications.

SELECTED PUBLICATIONS & CONFERENCE CONTRIBUTIONS

Accepted Paper | Urarina-Spanish Archival Information Retrieval 2026
David Braun and Michael Dorin | IEEE LA-CCI 2026 | Accepted conference paper

EMIC Wave Events During the Four GEM QARBM Challenge Intervals 2018
Journal of Geophysical Research: Space Physics | Coauthor

AGU Fall Meeting Research Outputs 2017
Contributor | SM51B-1176 and SM31B-2629

SELECTED RESEARCH SOFTWARE & EXPERIMENTS

UAV Software-Fault Injection & Telemetry Evaluation 2026
Research in progress | PX4, Gazebo Harmonic, MAVSDK, Python

- Automated matched healthy/fault experiments with explicit protocol gates, ULog evidence, and reproducible configuration hashes. Initial pilot: 30 runs; comparative diagnosis outcomes pending.

Urarina-Spanish Archives | Archival Information Retrieval 2026
Collaborative research | IEEE LA-CCI 2026 paper accepted

- Contributed to collaborative research on information retrieval for low-resource historical linguistic archives with Prof. Michael Dorin; related IEEE LA-CCI 2026 paper accepted, presentation/publication pending.

WeatherForge | NOAA Data Engineering & Risk Analytics 2026
Collaborative SEIS 745 academic project; lead developer

- Built Python/Shiny processing and dashboards transforming ~35 GB of NOAA data into 55,384 storm events and 9,008,748 station-day records; descriptive, not validated forecasting.

RAGeATM | Local Retrieval/Refusal Prototype 2026
SEIS 767 academic project | Python, TF-IDF, cosine similarity

- Built a small lexical retrieval system with score thresholds and refusal behavior, using a seven-question sanity benchmark.

Lecture Stream | Local Event-Driven AI Workflow 2026
MVP prototype | Kafka, Python, transcription, summarization

- Implemented components connecting audio ingest, transcription, summarization, archive storage, and exports; production scale not established.

EDUCATION

M.S. Artificial Intelligence, University of St. Thomas - expected Dec 2026. Graduate Certificate in Big Data - expected Dec 2026.

B.S. Mathematics, Physics & Computer Science, Augsburg University - 2020 (one degree, three majors).