

Aspen Johnson

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EDUCATION

Valdosta State University

B.S in Data Science: Computational Sci. & Eng. Track, Minors in Physics and Math

Expected: 2027, GPA: N/A

Palm Beach State

A.A in STEM: Mechanical/ Aerospace Engineering Track

Expected: Summer 2026, GPA: 3.5

PUBLICATIONS

An empirical application of improved gradient scaling for score-driven volatility filters

- In Collaboration with **Szabolcs Blaszek** and **Adam Kobor**; Conducted at Mercer University.

RESEARCH EXPERIENCE

Econometrics Researcher

Jan 2025 – Dec 2025

On-Site/Remote

Mercer University

- Co-authored and empirically tested the Hessian-filter scaled Beta-t-EGARCH volatility model, improving the traditional score driven filters with Newton-type gradient scaling.
- Analyzed log returns of high, in-demand, and volatile assets such as Bitcoin, S&P500 (IVV), Gold(IAU), U.S REITs, and the CHF/JPY for the period 2010-2025.
- Proved model robustness through major volatility shock events (COVID-19, 2022 Ukraine Invasion, 2023 Gaza conflict, and a 2025 presidential transition).

AI Researcher – BAIR – Prof. Gireeja Ranade

April 2025 – Present

UC Berkeley AI Research Lab

Hybrid

- Conducted research on transformer-based control, applying in-context learning to stabilize nonlinear and unstable dynamical systems (cartpole, acrobot).
- Designed and implemented a GPT-2-based few-shot controller that learns control strategies without retraining.
- Demonstrated generalization to unseen dynamics without weight updates or explicit system identification.

AI Researcher – AIFARMS, NCSA, CDA – Prof. Vikram Adve

Oct 2024 – Present

University of Illinois at Urbana-Champaign

On-Site

- Developing tools for LLM integration in production-scale chatbots, enhancing agentic workflows, which facilitated over 10,000 conversations and the efficient resolution of over 13,500 real-world problems.
- Implementing AI-driven solutions to increase the efficiency of current agricultural practices at scale.
- Building and researching agents, RFT, RAG, Reasoning, and pre/post training to advance AI capabilities in agriculture.
- Researching agentic LLM systems for agriculture: hierarchical multi-agent orchestration, context retrieval/management, and task delegation across specialized agents.
- Building tools (CSV, Shapefile agents) enabling LLMs to interact meaningfully with heterogeneous farm data streams.

TEACHING EXPERIENCE

Course Assistant & Project Manager – CS 124

Dec 2023 – May 2024

University of Illinois at Urbana-Champaign

On-Site

- Tutored students and led office hours for introductory computer science course.
- Mentored undergraduate teams through semester-long AI projects (Honors section).

INDUSTRY & ENGINEERING EXPERIENCE

Co-founder, CTO, Lead AI/ML Engineer – AgAnswers.ai

May 2025 – Present

Full-stack AI platform with multi-agent orchestration, vector DBs, and knowledge graphs

Remote

- Architected and developed full-stack AI platform for agricultural automation, including React/Next.js frontend with real-time chat interface and Python Flask backend with a vast network of llms, tools, and agents.
- Built production-scale document processing system with vector databases, embedding models, and multi-modal analysis capabilities for any data source.
- Building agentic workflows for ag, enabling automated decision-making for everything from data management to equipment monitoring.
- Deployed scalable infrastructure using Docker, Vercel, Railway, and Supabase, handling document ingestion queues, user authentication, and real-time streaming responses.

AI Engineer – BrightTech AI & Qsystems AI <i>Built AI tools and CrewAI-based multi-agent orchestration for enterprise workflows</i>	May 2025 – Aug 2025 <i>On-Site</i>
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- Architected and implemented CSV comparison agent system with intelligent schema detection, automated key column identification, and human-readable difference reporting.
- Built comprehensive contact intelligence pipeline processing 15+ standardized fields through two-stage agent architecture: signal collection and persona analysis.
- Developed 25+ specialized AI tools including BrightData integration, publication analysis, social media monitoring, and batch processing capabilities.
- Engineered CrewAI-based orchestration system with YAML configuration management, enabling scalable agent deployment (30-45 second per-contact processing latency).

Founding AI/ML Engineer – Startup (NDA) <i>Novel RAG architectures and hybrid embedding classification for resource-constrained NLP</i>	May 2024 – Aug 2024 <i>Remote</i>
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- Engineered advanced NLP systems, optimizing Retrieval-Augmented Generation (RAG) and intent classification.
- Designed a novel “wavular” RAG approach and hybrid embedding-based classification system.
- Applied vector space models, similarity metrics (cosine, Euclidean), and text representation methods.
- Managed large-scale NLP datasets with complex preprocessing for resource-constrained environments.

Founder – AAXIOM.org Startup Portfolio <i>NVRALONE (\$10K/month peak), IlliniPlan (1k+ users), Voxed (Acquired May 2025)</i>	March 2023 – Aug 2025
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PROJECTS

[Climate Predict — Global Warming Calculator](#) | Rust, Regression Models

- Developed a multi regression model in Rust. The project comprises 3 regression models: linear regression, polynomial regression, and random forest regression (incomplete).
- Used public NASA datasets to predict temperature change given CO2 emmisions.

[Devanagari Language Learning App](#) | Python, Flask, TensorFlow, Keras, scikit-learn, Pandas, NumPy, Matplotlib

- Engineered a Convolutional Neural Network (CNN) to accurately recognize natural handwritten language.
- Enhanced model performance and accuracy through data preprocessing and augmentation techniques, ensuring robustness against diverse handwriting styles.
- Optimized training efficiency with back-propagation and gradient descent.

[Voxed.ai — AI Powered Notebook](#) | Google Cloud Services, OpenAI API, Ubuntu, PyDub, Python

- Developed full-stack AI app that allows users to take notes, write code, and synthesize long form content via LLM interaction. LLM capable of code generation, direct note interaction, tool use, and file toggling via RAG pipeline.

[Manim Video Agent — Worlds Most Accessible Tutor](#) | Python, LLM, Pydantic, In-Context Learning, RL Fine-Tuning

- Developed an audio/video agent that can solve any problem and explain it using beautiful animations. Handles tool batching and parallelization, recursive error correction, state caching/resurrection, and phonetic TTS mapping.

[MinLLM — Ultra-Lightweight Workflow Framework](#) | Python, pip package

- A blazingly fast, zero-dependency framework for building directed graphs, LLM workflows, and agent systems. Written in roughly 100 lines while maintaining full expressiveness through operator overloading.

[IlliniPlan.com — Student Course Scheduler and Degree Progress](#) | Postgres, React, Typescript, Tailwind

- Over 1k active users, over 10k course schedules created, and over 100k course recommendations.

[Research Agent](#) | Python, Langchain, LLM, RAG

[IlliniSpots — UIUC Study Spot Finder \(IOS App\)](#) | Postgres, Firebase, Swift, React Native, Expo, Search

[VoxAI — The Autonomous Learning Assistant](#) | Google Cloud Services, OpenAI API, Ubuntu, PyDub, Python

[GuideMe — macOS app that guides users to perform tasks on Mac.](#) | Swift, SwiftUI, macOS

[WNA — Chrome extension that guides users with a mouse pointer.](#) | TypeScript, Chrome Extension API

LEADERSHIP, COMMUNITY ENGAGEMENT & EXTRACURRICULARS

Pro Bono Projects

- Design and develop apps, AI tools, and websites for friends, family, and community members **at no cost**, solving real-world problems across diverse domains.

Former Division 1 College Ice Hockey Player | *University Of Illinois Men's ACHA Division 1 Hockey*

Developed App for Plastic Surgeon | *Facilitates patient database management and surgical procedure simulations*

Chess | *Rated 2000 over-the-board, Training to become a FIDE Master*

BuildIllinois Cohort Team | *Building and fostering startups at UIUC*

Treasurer & Co-Founder of Illini Business Forum | *Investment Banking, Accounting, and Consulting at UIUC*

Content Creation | *Streamed myself working 80+ hours a week on youtube and amassed 11k+ followers, 1M+ views*

TECHNICAL SKILLS

Languages: C++, Python, TypeScript, Kotlin, JavaScript, Java, Rust, Julia

Developer Tools: Git, Linux, CLI, Docker, AWS, Vercel, Railway, CUDA

Robotics: ROS2, Isaac Sim/Lab, MuJoCo, Teleoperation

AI/ML: PyTorch, TensorFlow, Transformers, HuggingFace, OpenAI API, RAG, CrewAI, LangChain, VLA

Web & Cloud: React/Next.js, Flask, Supabase, Postgres, Firebase, Redis, Celery, FastAPI

Data: SQL, Vector DBs, Object Storage

OTHER

Clubs/Organizations: James Scholar, NSBE, MEP

Community: Run educational Discord server (1k+ members) focused on CS, ML/AI, Math, Physics, education, and life