

# Asray Gopa

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## EDUCATION

Iowa State University - Ames, IA

Aug 2022 - Anticipated: May 2026

Bachelor of Science - Major in Computer Science

3.70/4.0 GPA

Activities: President, Algorithmic Trading Club | Student Government Senator | SWE, prISUm Solar Car | Chair, CS Student Advisory Board | ΣNT

Honors: 6x Hackathon Winner (IvyHacks'24 - 1st, HackDSM'24 - 2nd, SwanHacks'25 - 3rd) | 8x Pitch Winner (MWEC'25 - 1st, ISU IP'23, 1st)

## EXPERIENCE

Principal Financial Group

May 2025 - Present

Software Engineering Intern

Des Moines, IA

- Built and deployed 3 internal full-stack tools (Node.js, Spring Boot) that automated manual reporting and reconciliation workflows, eliminating 100+ hours of manual work per week across actuarial teams.
- Designed production-grade APIs and database schemas, reducing data inconsistencies and lowering support tickets post-release.
- Executed chaos engineering experiments on AWS (EC2/RDS failover simulations) to expose single points of failure, reducing downtime risk by 20%+ for critical actuarial systems.
- Hardened disaster recovery pipelines and backup validation processes for models supporting billions in managed assets, improving recovery confidence and audit readiness.

Collins Aerospace

September 2025 - December 2025

Software Engineer Contractor

Remote

- Unified fragmented certification artifacts across multiple engineering tools into a centralized backend system, reducing artifact reconciliation time by 30% and accelerating compliance review cycles.
- Implemented a graph-based traceability engine to track requirement dependencies and changes, reducing engineering rework by 50%.
- Developed a Next.js interface to visualize cross-tool impact trees, increasing requirement coverage visibility by 40% during audits.

National Science Foundation - Moothedath Research Lab

January 2025 - September 2025

Research Intern

Ames, IA

- Prototyped decentralized multi-task learning architectures in Python to reduce centralized training overhead and improve scalability.
- Applied spectral clustering and graph-based task grouping to improve benchmark accuracy by 85%.
- Simulated distributed training on AWS EC2, achieving 30% faster convergence and validating model stability using Frobenius error metrics.

National Science Foundation - ARA Wireless Labs

May 2024 - December 2024

Research Intern

Ames, IA

- Developed deep learning models (Python, TensorFlow/PyTorch) to analyze TV white space and LoRa spectrum data, improving signal detection accuracy by 25%.
- Designed and deployed a LoRaMesh sensor hub integrating computer vision for plant health and pest detection in farms.
- Automated data ingestion pipelines and hardware provisioning scripts, eliminating 40+ hours/week of manual setup and cutting deployment time by over 50%.

The Brik

August 2023 - Present

Founder + Operator

Ames, IA

- Orchestrated the development of The Brik, a compact organizational tool, from concept to fruition, with 5 figures in annual sales.
- Oversaw market research, prototype development with 3D printing and laser cutting, and manufacturer partnerships to bring to market.
- Implemented effective marketing strategies, including social media campaigns, to build brand awareness and gather customer feedback.

## PROJECTS

Scalar News (Expo, C, CNN, NoSQL, LLM Prompt Engineering) - 1M Annual Impressions - [www.app.scalar.news](http://www.app.scalar.news)

- Developed cross-platform mobile app using Expo
- Built backend summarization pipeline combining CNN-based models and OpenAI API for dynamic article compression
- Designed MongoDB ingestion and ranking system to personalize and serve AI-generated news summaries at scale

HerdRight (Node.js, TypeScript, React, PostgreSQL, Stripe API) - [www.herdright.com](http://www.herdright.com)

- Built online marketplace connecting cattle breeders to buy and sell bovine reproductive genetics (bull semen and embryos)
- Implemented search, filtering, and matching system to help breeders find optimal pairings; integrated Stripe for secure transactions

Forex Arbitrage Engine (Python, PyTorch, NetworkX)

- Modeled FX pairs as weighted directed graphs and implemented Bellman-Ford cycle detection to identify real-time arbitrage opportunities
- Combined statistical and ML-based sentiment signals to reduce false positives from live market feeds

RustBitcoinWallet (Rust, secp256k1, Bitcoin protocol)

- Implemented key generation, transaction serialization, UTXO tracking, and ECDSA signing directly against Bitcoin protocol specifications
- Built wallet logic without external wallet SDKs to demonstrate protocol-level implementation

CTM vs Transformers on Bitcoin Orderbook Data (Python, PyTorch)

- Compared Continuous Thought Machines and Transformer models for price prediction using streaming L2 crypto order book data
- Evaluated latency, convergence stability, and directional accuracy across architectures

ApexNurse (Python, AR SDK, Speech-to-Text APIs, LLM APIs) — SwanHacks 2025 (3rd Place)

- Built an AR face shield that overlays real-time patient translation and AI-generated response suggestions for nurses
- Integrated speech-to-text pipeline to transcribe patient speech, detecting patient aggression, and assist nurses during live interactions

## SKILLS

Languages: Python, Rust, Java, C++, TypeScript, SQL

Backend & Systems: Spring Boot, Axum, Node.js, Flask

Databases & Frontend: PostgreSQL, MySQL, Neo4j, React, Next.js

Cloud & Infra: AWS, Azure, Docker, Kubernetes, Linux