Chuck de Sully

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Summary

Experienced software engineer with 15+ years delivering scalable, production systems, transitioning to machine learning and AI engineering. Recently completed Master's in Artificial Intelligence from Johns Hopkins University (GPA 3.91). Proven track record of building end-to-end ML systems with applications in transformers, computer vision, reinforcement learning, and optimization algorithms. Combines deep engineering expertise in building and deploying complex production systems with a research-driven approach to architect, optimize, and productionize complex AI solutions.

Technical Skills

- **Programming & Frameworks:** Python, PyTorch, TensorFlow, Scikit-learn, NumPy, Pandas, SQL, PHP, JavaScript, Java, Git
- **Machine Learning:** Deep Neural Networks, Reinforcement Learning, CNNs, LLMs, RAG Systems
- **AI Algorithms:** Genetic Algorithms, Differential Evolution, Fuzzy Logic, Particle Swarm Optimization
- **Engineering:** Full-stack development, API design, Database optimization, System architecture, Production deployment

Machine Learning Projects

- **Advanced Reinforcement Learning Agent:** Developed Q-learning agent to optimize search behavior. Research focused on state discretization effects on learning and generalization, leading to model size reduction approach.
- **RAG System for Financial Fraud Detection:** Built system using LangChain, Llama 3, and ChromaDB with custom API integration to SEC EDGAR data for identifying fraudulent accounting practices in public company filings.
- **ASL Recognition with Efficient Pre-Processing:** Implemented CNNs + Transformers for American Sign Language classification. Developed landmark extraction technique significantly reducing model size while achieving improved accuracy and faster inference.
- **Real-Time Computer Vision for Accessibility:** Created CNN solution using PyTorch for facial feature detection, translating eye blinks into Morse code in real-time.
- **Optimized Fuzzy Logic Stock Prediction:** Enhanced published research algorithm by proposing alternative rules and utilizing particle swarm optimization for more efficient investment strategies.
- **Advanced Differential Evolution for Gene Targeting:** Improved 2022 research paper's DE solution with novel modifications including double target vector adjustment and fuzzy rule-based mutation control.
- **Production Data Drift Detection System:** Developed neural network activation statistics method to identify data model staleness and trigger retraining actions.
- **Interpretable Genetic Algorithm for Discrete Optimization:** Architected a unique Genetic Algorithm that optimizes to a specific goal by engineering mathematical equations, providing a **discrete and interpretable solution** rather than a black-box model.
- **Hybrid Genetic Algorithm/Neural Network for NN Optimization:** Engineered a novel Genetic Algorithm / Neural Network hybrid that distilled information from parent to child, exploring **Neural Network population optimization** through an innovative evolutionary approach.

Professional Experience

STAFF SOFTWARE ENGINEER | INSEEGO | REMOTE | JUNE 2022 – PRESENT

Led advanced engineering initiatives, integrating agentic AI prototypes and optimizing critical production systems.

- **Spearheaded research and implementation of Agentic AI systems** for client ordering assistance and internal documentation search, driving product innovation.
- **Re-engineered post-ordering processes, achieving a 97% efficiency increase** in operational workflows.
- **Optimized critical SQL queries, resulting in an 80% average efficiency increase** across core production systems.
- **Resolved critical full-stack production issues** through deep stack tracing and debugging.
- **Managed and oversaw code deployment processes for 12+ years**, ensuring robust and reliable software delivery in a production environment, directly applicable to MLOps.
- **Provided technical consultation** for legacy modernization and authored comprehensive system diagrams.

SENIOR SOFTWARE ENGINEER | INSEEGO | REMOTE | JULY 2017 – JUNE 2022

Architected and led cross-system development for high-volume order procurement platform, driving automation and throughput improvements.

- **Led engineering and architected core functionality** for a complex order procurement platform, ensuring scalability.
- **Implemented API integrations to automate ordering processes, boosting order processing counts by 100x.**
- **Developed customer support auditing tools for orders, resulting in an 83% reduction in manual work**.
- **Created comprehensive order flow error system** providing actionable insights for management and vendors.
- **Prototyped a headless system for API access and white labeling**, expanding vendor integration capabilities.
- **Collaborated with telecom engineers** to prototype complex SOAP API connections to enable critical integrations.
- **Developed an API chaining tool** enabling customer care with full client/vendor dispute resolution efficiency.

SOFTWARE ENGINEER | FEENEY WIRELESS | EUGENE, OR | JULY 2011 – JULY 2017

Led engineering efforts for cellular device procurement, re-architecting core systems, developing open-source frameworks, and initiating on-site machine learning training.

- **Led the engineering team** in architecting and deploying a robust administration platform for order management.
- **Developed and open-sourced the Symmetry MVC framework**, enabling lightweight client-server data flow and contributing to the broader developer community.
- **Directed the initial re-architecture of the primary web application and backend systems**, bridging legacy code to scalable solutions and using engineering patterns to reduce technical debt.
- **Conducted technical interviews, onboarded new hires, and mentored junior engineers**, fostering team growth and skill development across multiple projects.
- **Developed a web application** for tracking remote devices, integrating seamlessly with a mapping API to provide real-time location insights.
- **Initiated and organized on-site machine learning training programs**, proactively enhancing the team's capabilities in emerging technologies.

WEB APPLICATION ENGINEER | EPIC | EUGENE, OR | NOVEMBER 2009 – JULY 2011

Developed robust SaaS solutions for educational policy improvement, focusing on web application architecture, database engineering, and secure data protocols.

- **Led syllabi web application project**, designing SQL schemas and JSON-RPC endpoints for a comprehensive CMS.
- **Engineered customized SOAP encryption** to enhance peer-to-peer security for sensitive educational policy data.
- **Utilized ORM and JavaScript libraries** to drive front-to-back product improvements and optimize user experience.

Education

Johns Hopkins University | Baltimore, MD
Master of Science in Artificial Intelligence | Dec 2024 | **GPA: 3.91**
Oregon State University | Corvallis, OR
Bachelor of Science in Computer Science | Jun 2004