Aaron M. Hosford

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Website | GitHub | HTML Resume | PDF Resume | LinkedIn | Patent Info

Seeking: ML Researcher, Data Scientist, ML Engineer (Fully Remote, Assisted Relocation, or North Texas)

Expertise: ML Model Design, Algorithm Design, HDC, Deep Learning, Python, Software Dev

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Introduction

Highly creative systems thinker and radical innovator with a deep and broad understanding of ML algorithms, theory, and applications. 18+ years of workplace experience – 30+ years counting personal projects. Track record of proven, patent-worthy designs. Seeking research or engineering role in Data Science, Machine Learning, or NLP, with a focus on novel algorithm development and/or application to new domains.

- Excellent problem-framing, problem-solving, analysis, & critical thinking.
- Strong coding, design, & data skills.
- Fast-learning autodidact and cognitive "heavy lifter".
- Grounded, focused, and clear-headed in the face of extreme domain complexity.
- Thrives on "impossible" problems.

Major Accomplishments

- Co-founder of a (non-LLM) deep-tech ML/AI startup.
- Inventor of numerous proprietary machine learning algorithms, including work with hyperdimensional computing, deep learning, genetic programming, and reinforcement learning.
- Architect of a proprietary *non-LLM* natural language and artificial intelligence system for open-domain, reliable, fully interpretable multi-hop reasoning and Q&A.
- Patent author for an anaphora resolution algorithm.
- ML/NLP-related contributions to the initial public release and ongoing support of a natural language financial assistant used by millions of customers of a major bank.
- Author and maintainer of the open-source XCS Python library, an object-oriented implementation of the eponymous XCS machine learning algorithm.
- *National Merit Scholarship* winner with full scholarship to the University of Texas at Dallas.

Summary of Technical Skills

Algorithm Design | Algorithm Development | Anaphora Resolution | Artificial Intelligence (AI) | Artificial Neural Networks (ANN) | Automated Proof Verification | Automated Theorem Provers | Automatic Differentiation | Bayesian Modeling | Business Process Automation | C | Computational Theory | CUDA | Cython | Data Annotation | Data Annotation Pipeline Design/Management | Data Mining | Data Science | Deep Learning | Dependency Parsing | Discriminative Models | Evolutionary Algorithms | eXtended Classifier Systems (XCS) | Extract-Transform-Load (ETL) | Generative Models | Genetic Algorithms (GA) | Genetic Programming (GP) | Graph Neural Networks (GNN) | Formal Logic | Fuzzy Logic | Hybrid ML Algorithms | Hyperdimensional Computing (HDC) | Information Theory | JSON | Knowledge Graphs | Knowledge Representation | Large Language Models (LLM) | Learning Classifier Systems (LCS) | Long Short-Term Memory (LSTM) | Machine Learning (ML) | Mathematics | Metric Spaces | Multithreaded Applications | Natural Language Processing (NLP) | Natural Language Understanding (NLU) | Natural Language Generation (NLG) | Neural Architecture | NumPy (np) | Ontology | Optimization | Parser Design | Particle Filters | Probability Theory | Python | Reinforcement Learning (RL) | Requirements Analysis | Semantic Pointer Architecture (SPA) | SQL | Statistics | Symbolic AI | Technical Leadership | Temporal Differences (TD) | Tensor Computing | TensorFlow (tf) | Theano | Torch/PyTorch

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Education

Dual major, Computer Science and Mathematics, 1997 to 2001

University of Texas at Dallas, Richardson, Texas

Awards: National Merit Scholar, Silver Anniversary Scholarship

Note: I completed the core curriculum but was forced to drop out just before graduation due to a disability-related life event. I have the education, but not the degree.

Autodidact and Machine Learning/AI Enthusiast, 1990 to current

Over 30 years of continually focused self-learning, practice, and experimentation

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Relevant Experience

Role	Co-Founder and Chief Science Officer
Employer	Transparent AI
Location	Remote
Duration	Feb 2024 to current
Skills	Technical Leadership, Algorithm Design, Product Design, Requirements Analysis, HDC, ML, Programming
Summary	CSO and co-founder of a startup in deep-tech ML/AI.
Accomplishments	• Developed bespoke algorithms for explainable/interpretable AI. • Worked with design team to develop product designs. • Worked closely with product development team to rapidly develop working prototypes. • Assisted in pitching directly to investors.

Role	Senior Software and Machine Learning Engineer
Employer	Wiser Solutions, Inc.
Location	Remote
Duration	Nov 2022 to Feb 2024
Skills	ML, Image Processing, Algorithm Design, Requirements Analysis, Technical Leadership
Summary	Helped develop a product matching pipeline for online retail pricing.
Accomplishments	• Developed a bespoke high-throughput image clustering algorithm for reliably identifying representative images for similar products across multiple online retailer sites. • Designed & developed a data labeling pipeline for crowdsourcing training and evaluation samples appropriate to the problem domain. • Comprehensive model analysis and evaluation, including the development of a novel framework for evaluation metrics appropriate to the novel problem space of N-ary representative image selection. • Designed a responsive pipeline for continually applying the representative image selection algorithm to a live data stream.

Role	Machine Learning Engineer
Employer	Insight Global (initial contract), Bank of America (hired full-time)
Location	Plano, TX
Duration	Oct 2017 to Nov 2022
Skills	NLP, ML, Data Science, Algorithm Design, Programming, Requirements Analysis, Technical Leadership
Summary	Conversational agent: Designed, implemented, tested, and evaluated entity recognition, intent detection, and anaphora resolution models & algorithms.
Accomplishments	• Patent pending for an anaphora resolution algorithm. • Part of the team responsible for the ML and NLP subsystem of a virtual financial assistant – a groundbreaking chatbot serving tens of millions of bank customers . • Significant improvements to intent and entity recognition model performance. • Extensive enhancements to the team's data handling processes and model metrics. • Built natural language annotation tools from scratch. • Built bespoke heuristic/rule-based system for time entity extraction. • Regularly collaborated with other experts to improve customer experience in accordance with stakeholder direction.

Role	Lead Systems Architect
Employer	Ericsson
Location	Plano, TX
Duration	Jun 2014 to Sep 2017
Skills	Programming, ML, Algorithm Design, Requirements Analysis, Technical Leadership
Summary	Projects ranging over a variety of domains, including business process automation, explainable AI applications, and supply chain forecasting pipeline.
Accomplishments	• Trained & led a remote team in an agile environment. • Designed and built an automated supply chain forecasting pipeline. • Worked closely with stakeholders to identify business requirements. • Evaluated and applied a multitude of ML algorithms, including deep learning, decision trees, market basket analysis, and ARIMA. • Designed and developed an open-sourced Python business automation framework.

Role	Programmer/Software Analyst
Employer	West Asset Management (now Alorica)
Location	Sherman, TX
Duration	Nov 2006 to Jan 2014
Skills	Programming, Automation Design, Requirements Analysis, ETL, Technical Leadership
Summary	Business process automation for varied domains including ETL, scripting, web scraping, and financial reporting.
Accomplishments	• End-to-end design, implementation, and automation of client-facing financial and account data interfaces, handling financial data in excess of $50,000,000+ with associated personally identifiable information and health data. • Conception, design, and coding of extensive contributions to the in-house business automation library. • Regularly relied on for reviews and difficult debugging scenarios for code running on remote systems.

Role	Software Engineer (Intern)
Employer	Ericsson
Location	Sherman, TX
Duration	Aug 1998 to Nov 2001
Skills	Programming, OPNET Simulation, Product Design
Summary	Undergrad working as a graduate-level software engineering intern for a collaborative project between Ericsson and UT Dallas to research VoIP telephony quality.
Accomplishments	• Coded network traffic analysis simulations. • Built a telephony switch documentation management system.