Resume (Huang Tang)

Information

- **Job Title**: Principle Artificial Intelligence Engineer
- **E-Mail**: huangtang@gmail.com
- **Mobile**: (571) 604-9188
- **Location**: Great Falls, Virginia

Expertise

- Artificial Intelligence (AI), Machine Learning (ML), Data Science (DS), Model-Based Systems Engineering (MBSE), Modeling & Simulation (M&S).
- End-to-end product development, leveraging Systems Thinking, Life-Cycle Management, and operational experiences, of impactful AI/ML solutions to address business challenges in diverse application domains.
- Business development; innovative researches; product development; operational management.
- Integrating AI/ML/DS with existing workflow to enhance productivity and service qualities, leveraging best practices in MLOps.
- Data and model governance in Healthcare and privacy-sensitive domains.

Artificial Intelligence Expertise

- **Machine Learning technologies**: Convolutional Neural Networks (CNNs), Recurrent Neural Networks (RNNs), Graph Neural Networks (GNNs), Transformers, Large Language Models (LLMs), Reinforcement Learning (RL), Causal Learning, , Multi-modal Learning.
- **Application domains**: Natural Language Processing (NLP), Knowledge Graphs (kG), Computer Vision (CV), Time-series Analysis, Predictive Analytics, Decision Support, Causal Discovery, Portfolio Optimization, Network Operations, Anomaly Detection.
- **AI/ML frameworks**: PyTorch, TensorFlow, MxNet, ONNX, Ray, MLflow.
- **LLM technologies**: Retrieval Augmented Generation (RAG), Agentic AI , Model Context Protocol (MCP).

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Working Experience

The MITRE Corporation (Sep 2012 - Jul 2025)

- **Job Title**: Principal Artificial Intelligence Engineer
- **Agencies served**: Defense Information Systems Agency (DISA), Defense Health Agency (DHA), Federal Aviation Administration (FAA), Internal Revenue Service (IRS), Department of Homeland Security (DHS)

HighLights of Contributions

- As the Chief Engineer, starting from scratch, delivered the MERIT (Medical Evaluation Readiness Information Toolset) project, which is the first AI/ML-driven enterprise-level clinical decision support system for troop readiness and service member disability prediction, leveraging Electronic Health Records (EHRs).
- Proposed and led the development of six innovative products across various application domains.

Large Language Model (LLM) Applications (LLM, RAG/GraphRAG, Generative, Agentic, MCP)

- Question answering system leveraging Knowledge Graph (KG) indexed Retrieval Augmented Generation (RAG) [role: Tech Lead]
- Recommendation system for aviation safety incident analysis [role: Project Lead]
- Using LLMs and GraphRAG for regulatory compliance in aviation safety [role: Tech Lead]
- Architecture auto-generation from large collection of design documents leveraging Knowledge Graphs [role: Project Lead]
- Aviation Safety Regulation De-conflicting using Large Language Models and Knowledge Graphs [role: Tech Lead]

Portfolio Optimization Applications

- Large organization budget planning and contract evaluation system using Generative AI [role: Product Owner]

Time-Series Analysis and Predictive Analytics

- Multi-modal multi-variate time-series anomaly detection [role: Project Lead]
- Disability outcomes prediction (Medical Evaluation Readiness Information Toolset) [role: Chief Engineer]
- Reduce uncertainty in weather forecasting using data assimilation [role: Project Lead]
- Aviation accidents/incidents root cause mining using temporal-spacial transformers [role: Project Lead]

Graph-Based Machine Learning Applications

- Tax fraud detection in large corporation networks [role: Project Lead]
- Global scale data center network traffic engineering [role: Tech Lead]
- National Air Space traffic flow network modeling & spatial reasoning [role: Tech Lead]
- Complex systems modernization: architecture auto-design and modernization roadmap autodiscovery [role: Project Lead]

Computer Vision Applications

- Convective weather impacts on pilot behaviors using satellite images [role: Tech Lead]

Other Efforts

- Airport ground traffic management using Reinforcement Learning [role: Tech Lead]
- DARPA AI/ML seedling challenge design for critical mineral assessment [role: Contributor]

Metavi, LLC (Feb 2011 - Aug 2012)

- **Job Title**: Co-Founder
- Collecting, processing, modeling, and animating of aviation traffic control data along with weather information.

George Mason University (2005-2010)

- **Job Title**: Research Scientist
- High fidelity severe weather prediction, meteorological modeling, and development/evaluation/validation of atmospheric transport and dispersion models.

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Education

- Ph.D. Studies and Research, Aerospace Engineering and Mechanics, University of Minnesota, 1998-2005
- M.S., Civil Engineering, Human University, 1998
- B.S., Engineering Mechanics, Hunan University, 1993

Publications

1. (2024) On the Exploration of Temporal Fusion Transformers for Anomaly Detection with Multivariate Aviation Time-series Data. DASC 2024.
2. (2022) Adaptable Graph Network for Traffic Analysis Applications. DASC 2022.
3. (2021) Medical Evaluation Readiness Information Toolset (MERIT): Developing a data-driven support tool to augment complex clinical decisions.
4. (2019) Deep Reinforcement Learning Applied to Airport Surface Movement Planning. DASC 2019.
5. (2016) Use Data Assimilation to Reduce Uncertainties in Ensemble Forecasting for Strategic Traffic Flow Management. 18th Conference on Aviation, range, and Aerospace Meteorology.
6. (2014) Agile Simulation Based Analysis of Acquisition. Summer Computer Simulation conference 2014.
7. (2009) Surface Transport in Continuum Mechanics. Mathematics and Mechanics of Solids, 14 (587-598).
8. (2009) Results Validation of Joint Effects Model Using Seven Field Data Sets. 13th Annual George Mason University Conference on Atmospheric Transport and Dispersion Modeling, Fairfax, Virginia.
9. (2007) Electrodynamics and Thermodynamics of Material Bodies. Journal of Elasticity, 88 (255-297).
10. (1997) Nonliear Analysis of Dynamics Stability for Thin-Walled Beams with Open Section in Large Overall Motion. Chinese Journal of Colored Metals 7.

Skills

- **Programming languages**: Python, Spark, TypeScript, Java, R, Matlab
- **Agentic AI frameworks**: LangChain/LangGraph/LangSmith, LlamaIndex, Anthropic MPC
- **AI/ML frameworks**: PyTorch, TensorFlow, MxNet

- **MLOps frameworks**: Ray, MLflow, Kubeflow
- **Database Systems**: PostgreSQL, Neo4J, Cassandra, MongoDB, Weaviate, Pinecone, ActiveLoop,
- **Cloud Platforms**: AWS (Bedrock, SageMaker, Titan, Textract, ECS, EKS, Lambda), GCP, Azure
- **DevOps Tools**: Docker, Kubernetes, Jenkins, Git
- **Frontend**: React, D3.js, FastAPI, Streamlit, Dash, Flask