

Education

Iowa State University	Ames, IA
Ph.D., Computer Science	<i>Graduated OCT 2025</i>
Iowa State University	Ames, IA
M.S., Artificial Intelligence	<i>Graduated JAN 2024</i>
BRAC University	Dhaka, Bangladesh
B.Sc., Computer Science & Engineering	<i>Graduated AUG 2018</i>

Professional Summary

Accomplished Data Scientist and AI Engineer with expertise in computer vision, reinforcement learning, and autonomous systems. Experience developing sophisticated AI solutions for transportation safety, environmental analysis, and quantum computing applications. Strong technical knowledge in Python programming, machine learning frameworks, and data engineering. Proven record of translating complex analyses into actionable insights and leading cross-functional initiatives to improve system accuracy and operational efficiency.

Experience

Amazon.com Inc.	Sunnyvale, CA (SJC10)
Applied Scientist II	<i>January 2026 – Present</i>
<ul style="list-style-type: none">Developing applied machine learning and statistical models for traffic engineering and transportation systems, supporting large-scale traffic analysis and operational decision-making.Designing data-driven methodologies for traffic monitoring, congestion analysis, and system optimization under real-world constraints.Building scalable data pipelines, experimentation frameworks, and evaluation metrics to validate model performance and robustness in production environments.Collaborating cross-functionally with traffic engineers, software engineers, and product stakeholders to translate domain requirements into reliable applied ML solutions.	
Dallas College	Dallas, TX
Lecturer	<i>August 2025 – Present</i>
<ul style="list-style-type: none">Delivered engaging course instruction based on official curriculum, maintaining a consistent schedule of teaching and office hours to support student success.Developed and refined instructional materials and assessments using diverse teaching methodologies to accommodate varied learning styles.Provided timely and constructive feedback to students to guide their learning and evaluate progress toward course objectives.Contributed to the college’s mission by serving on departmental committees and participating actively in curriculum review processes.	
Amazon.com Inc.	Seattle, WA
Applied Scientist Intern	<i>May 2025 – August 2025</i>
<ul style="list-style-type: none">Developed a Knowledge Graph framework to unify and process over diverse datasets by automating format detection and removing project-specific dependencies.Pioneered a novel negative sampling technique for sparse knowledge graphs and implemented 8 state-of-the-art methods to boost model training effectiveness.Engineered a recommender system to automatically select optimal model architectures and sampling strategies based on dataset characteristics.Built a comprehensive toolkit for evaluation, analysis, and reproducible research, featuring automated dataset discovery and quality metrics.Proposed a novel Knowledge Graph Embedding (KGE) model and an efficient evaluation methodology tailored to specific Amazon business requirements.Researched and developed solutions for ambiguous problems in NLP, computer vision, and robotics to support strategic technology initiatives.Designed and tested scalable algorithms in collaboration with senior scientists, contributing to production-level systems.	

SoilSerdem
Data Scientist

Ames, IA
Jan 2024 – Dec 2024

- Engineered a precision Soil Mapping Engine boosting mapping accuracy by 35%, enabling data-driven decisions for 10+ farms.
- Designed QGIS tool scripts for AWS integration, reducing hosting costs while increasing processing speed by 20%.
- Optimized cloud architecture reducing infrastructure costs while maintaining performance.
- Developed environmental data models improving prediction capabilities for resource allocation decisions.
- Led cross-departmental machine learning initiatives enhancing data-driven decision-making.

Iowa State University
Graduate Assistant

Ames, IA
August 2020 – May 2025

- Led development of navigation solutions for Iowa DOT snowplow operations, significantly reducing accident risks and improving response times during extreme weather events.
- Publications include EMNLP (2), ECAI (1), IEEE ITSC (3), and CVPR (1); with additional submissions under review at ICLR, CVPR, and IEEE Transactions on ITS.
- Developed real-time crash detection system with narrative generation using LLMs, creating an efficient incident reporting pipeline through synthetic video simulations of adverse conditions.
- Engineered multimodal video-text understanding systems that enhanced identification of critical safety hazards, enabling more timely traffic management interventions.
- Designed data-driven frameworks that measurably reduced operational risks and contributed to decreased highway incident rates for Iowa DOT.
- Developed Quantum Neural Networks increasing anomaly detection accuracy by 10% for next-generation network security applications.
- Implemented reinforcement learning algorithms that optimized cellular simulations and improved efficiency in CAR T-cell therapy research.
- Published multiple peer-reviewed research papers on crash analysis and traffic systems, contributing valuable insights to the transportation safety community.
- Served as Teaching Assistant for graduate courses in Motion Planning, Programming, Databases, Machine Learning, and Deep Learning, consistently receiving positive student feedback.

Etalyc Inc
Data Engineer Intern

Ames, IA
May 2021 – Jul 2021

- Developed analytics protocols improving data processing efficiency and traffic prediction accuracy.
- Created ML models for pedestrian movement prediction to improve safety at high-risk intersections.
- Generated reports identifying traffic optimization opportunities for urban planning decisions.

The University of Vermont
Graduate Teaching Assistant

Burlington, VT
Aug 2019 – May 2020

- Delivered machine learning instruction focusing on practical applications and fundamental concepts.
- Created teaching materials and exercises increasing student engagement and skills assessment.

AI Training Program
Trainee

Dhaka, Bangladesh
Oct 2018 – Feb 2019

- Led a team of three to deliver a traffic sign detection system with 95% accuracy.
- Implemented efficient team communication strategies resulting in streamlined project execution.

Skills

- **Programming:** Python, Java, SQL, C++, R, Go
- **Web:** FastAPI, Flask, Streamlit, React
- **Databases:** MySQL, PostgreSQL, MongoDB, SQLite, Elasticsearch, Athena
- **DevOps:** AWS, Git, GitHub, Jenkins, Docker, Kubernetes

ML & AI: PyTorch, Scikit-learn, Keras, ONNX

LLM: Azure Databricks, LangChain, Ollama

Vector DBs: Chroma, Faiss, Pinecone

Data Engineering: Spark, Hadoop, ETL, Kafka

Monitoring: Splunk, Datadog

CV & Simulation: OpenCV, SUMO, Isaac Gym, CARLA

RL: Ray, RLlib, Stable Baselines3

Visualization: Tableau, Matplotlib, Plotly, QGIS

Analysis: R Studio, MATLAB

Quantum: torchquantum, Qiskit, PennyLane

Expertise: Crash Analysis, Prompt Engineering, Predictive Modeling, Time Series, Autonomous Systems

Certifications: Google Cybersecurity, Meta DB Engineer