Ibne Farabi Shihab

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Experience

- **Data Scientist, SoilSerdem, Ames, IA** *Jan 2024 – Dec 2024*
  - **Soil Mapping Engine**: Engineered the Soil Mapping Engine, a foundational tool for the company, for delivering accurate, personalized soil maps to growers/farmers and enabling accurate geospatial analyses.
  - **QGIS Tools for AWS**: Streamlined operations by designing QGIS tool scripts for portability and seamless AWS integration, reducing the hosting cost of QGIS software.
  - **Environmental Data Models**: Optimized environmental data processing by validating models, uncovering actionable patterns, and improving decision-making accuracy.
  - **Interdisciplinary Projects**: Deployed machine learning applications that provided actionable insights, enhancing collaboration across departments and meeting project goals.
  - **Data Analysis**: Accelerated stakeholder decisions by analyzing complex datasets, creating detailed visualizations, and delivering actionable reports.
- **Graduate Assistant, Ames, IA, Iowa State University** *August 2020 – Present*
  - **Iowa DOT Snowplow Project**: Directed the Iowa DOT Snowplow Navigation Project, successfully deploying solutions to enhance snowplow operations in Tama, Iowa.
  - **Crash Video Analysis**: Implemented Large Language Models (LLM) to develop real-time crash video descriptions and detection systems, incorporating synthetic crash video generation for enhanced simulation capabilities.
  - **ADAS Development**: Engineered and tested advanced driver assistance systems (ADAS) under extreme conditions, leading to significant enhancements in traffic safety.
  - **Crash Analysis**: Analyzed extensive crash datasets, developing a framework that reduced operational risks and aimed to lower fatality rates for the Iowa DOT.
  - **Deep Learning Models**: Created predictive deep learning models for heart and respiratory rate monitoring, culminating in multiple accepted publications.
  - **Research Papers**: Authored and co-authored research on traffic simulation, crash narrative predictions, and severity analysis, advancing the field of machine learning applications in transportation.
  - **Reinforcement Learning**: Designed and implemented reinforcement learning models for cellular simulations, effectively bridging theoretical concepts with practical applications.
  - **Teaching responsibilities**: Collaborated with faculty to design and refine course assessments, ensuring alignment with learning objectives and measurable outcomes while systematically evaluating student performance to assess learning outcomes, which informed targeted instructional improvements and contributed to increased course success rates.
- **Data Engineer Intern, Etalyc Inc, Ames, IA** *May 2021 – Jul 2021*
  - **Analytics Protocols**: Developed advanced analytics protocols, improving data accuracy and predictive capabilities.
  - **Pedestrian Safety**: Created machine learning models for pedestrian movement prediction, enhancing safety measures.
  - **Strategic Reports**: Produced data-driven reports highlighting key trends and anomalies for strategic improvements.
- **Graduate Teaching Assistant, The University of Vermont, Burlington, VT** *Aug 2019 – May 2020*
  - **Teaching Machine Learning**: Taught machine learning and deep learning concepts to over 100 undergraduate students, improving course understanding by 20%.
  - **Innovative Materials**: Developed innovative teaching materials, fostering higher student engagement and retention.
- **Trainee, Artificial Intelligence Trainee, Dhaka, Bangladesh** *Oct 2018 – Feb 2019*
  - **Traffic Sign Detection**: Led a team of three to deliver a traffic sign detection system with 95% accuracy.
  - **Team Communication**: Implemented efficient team communication strategies, resulting in streamlined project execution.

Education

- **Ph.D., Computer Science, Ames, IA, Iowa State University** *Anticipated Dec 2025*
- **M.S., Artificial Intelligence, Ames, IA, Iowa State University** *Graduated Jan 2024*
- **B.Sc., Computer Science & Engineering, Dhaka, Bangladesh, BRAC University** *Graduated 2018*

Skills

- **Programming Languages**: Python, SQL, Java, C++, R
  Frameworks & Libraries: TensorFlow, PyTorch, Scikit-learn, Pyspark, Gym, OpenCV, Keras
- **Data Science & Visualization Tools**: Tableau, Matplotlib, Bokeh, Seaborn, Plotly
  Cloud Platforms & Development Environments: AWS, ROS, QGIS
- **Machine Learning & AI Expertise**: Large Language Models (LLMs), Reinforcement Learning, Predictive Modeling, Deep Learning, Natural Language Processing (NLP), Computer Vision
  Big Data Technologies: Hadoop, Apache Spark, PySpark
- **Simulation & Automation Tools**: SUMO, IssacGym, CARLA, OpenAI Gym, RLib, Ray
  Statistical Analysis & Modeling: R Studio, MATLAB
- **Geographical Information Systems (GIS)**: QGIS, ArcGIS, Digital Map Making, High-Resolution Map Generation, Spatial Data Analysis, Remote Sensing, Geospatial Data Visualization, Satellite Imagery Processing, Terrain Modeling, Location-Based Analytics
- **DevOps & Version Control**: Docker, Git and Github
  Specialized Expertise: Crash Analysis, Spatial Data Analysis, Traffic Simulation, Synthetic Data Generation, Robotics
- **Certifications**: Google Cybersecurity, Meta Database Engineer, Data Engineer Professional Certification, Google Data Analytics Professional Certification, Udacity Deep Learning Nano Degree etc.