MD HASAN ANOWAR

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PROFESSIONAL SUMMARY

4th year computer engineering PhD Student at Iowa State University with 5+ years of experience in machine learning, neural networks, and spatio-temporal data mining. Performed applications of time series analysis, statistical modeling, and generative AI. Also proficient in databases, distributed systems, and large-scale data analysis. Documented 4 peer-reviewed research papers as first author. Looking for a machine learning/AI intern position.

EXPERIENCES

Machine Learning Engineer Intern | **Viasat, CA** | June '24 – Sept '24
- Developed ML regressor models to estimate the in-flight speed using large-scale time series data.
- Performed data cleaning, feature preprocessing, hyperparameter tuning, model training & evaluation using decision tree and ANN based models on AWS SageMaker.
- Optimized the quality-of-experience delivered to clients as part of the Global Space Network division.

Machine Learning Research Assistant | **Evolving Data Lab, ISU, IA** | Jan '23 - Present
Graph Neural Network
-Engineered dynamic graph structures via data augmentation of time-stamped spatial datasets.
-Developed transformer encoder models for evolving graphs using PyTorch.
-Successfully performed link prediction, demonstrating proficiency on benchmark recommender datasets compared to static and dynamic GNN baselines.
Sentiment Analysis (RNN)
-Designed a sentiment detection model for movie reviews using the sequential models. Implemented an LSTM based model which outperformed vanilla RNN by 50% accuracy.
Image Style Transfer (CNN)
-Tasked to transfer style from an art image to a content image. Implemented convolutional neural network model (VGG19) to extract the feature map.
- Introduced an additional convolution layer and fine-tuned feature weights resulting in obtaining the visually optimal image.

Applied Machine Learning Researcher | **UTRGV, TX** | Jan '19 - Dec '20
- Developed a Python-based software tool for brain-computer interface to interpret biological signals.
- Performed predictive modeling incorporating support vector machines, decision trees, logistic regression, linear discriminant analysis, KNN, etc.

Data Science Research Assistant | **ISU, IA** | Jan '21 - Dec '22
- Responsible for uncovering spatial-temporal patterns from large moving object data (>2,000 GBs).
- Proposed a novel spatiotemporal cluster employing clustering algorithms.
- Developed a compression algorithm to store huge volumes of data, enhancing query processing efficiency by 4 times and storage gain by 5 times.
- Collaborated with chemists on capturing causal relationships based on domain semantics.

Large-Scale Data Systems Instructor | **ISU, IA** | Jan '24 – May '24
- Taught lab sessions on static and dynamic large-scale data processing and related algorithm designs.
- Integrated Java with big data tools like Hadoop's MapReduce for static data and Apache Flink and Apache Spark for dynamic data. Conducted hands-on experiences with Apache Pig, RDDs, and HDFS.

Senior Design Project Mentor | **ISU, IA** | Aug '23 - May '24
- Mentored four undergrad students to design a user interface for visualization of mined patterns from trajectory data; resulted in a demo paper at SIGSPATIAL'24.

EDUCATION
Ph.D. in Computer Engineering | Jan '21 - Dec '25 (expected)
Iowa State University (ISU), IA, USA
M.S. in Electrical Engineering | Jan '19 - Dec '20
University of Texas Rio Grande Valley (UTRGV), TX, USA
B.Sc. in Electrical and Electrical Engineering | May '10 - Sept '15
Bangladesh University of Engineering and Technology (BUET), Bangladesh

PROJECTS
Integration of Chameleon Cloud with LLVM Compilation (Cloud Computing)
-Provisioned a bare-metal node and launched a bare-metal instance.
-Built a functional docker container from image, compiled a C program into intermediate representation (IR) code using LLVM/Clang, and deployed it in the cloud.

Database and Query Processing
-Designed multidimensional cubes using SQL Server Data Tools and SQL Server Management Studio and performed OLAP using MDX on large volume of data from the data warehouse.
-Worked with NoSQL database management system (Neo4j, MongoDB) and geospatial data using geographic system application (QGIS).

SKILLS
Programming: Python, SQL, JAVA
Python Libraries: PyTorch, Keras, TensorFlow, Scikit-learn, Pandas, Numpy, SciPy, DGL, PyTorch Geometric, NetworkX
Database and Big Data: NoSQL, MS SQL, Trino, MySQL Workbench, MongoDB, Apache Spark, Hadoop, MapReduce, Pig, QGIS, MDX, Cypher Neo4j, Flink
Data Visualization: Matplotlib, Seaborn, Plotly, Apache Superset
Platform: Linux, MacOS, Windows, VSCode, PyCharm
Miscellaneous: AWS SageMaker, Git, MATLAB, CUDA, Docker, LaTeX

PUBLICATIONS
- Md Hasan Anowar et al., "Bond-Aware Moving Cluster of Atomic Trajectories with Relaxed Persistency", SIGSPATIAL 2024
- Md Hasan Anowar et al. "Compressing generalized trajectories of molecular motion for efficient detection of chemical interactions", Information Systems 2024
- Md Hasan Anowar et al. "Generalization Aware Compression of Molecular Trajectories". ADBIS 2022. LNCS, vol 13389. Springer, Cham. (**Best Paper Award**)
- Md Hasan Anowar, "A Modified Incremental Conductance Based Photovoltaic MPPT Charge Controller" in ECCE 2019

LEADERSHIP SKILLS
Vice-President, GO-ECpE at Iowa State University | Sept 22-Present
- Organized IBM Quantum Computing (Qiskit) workshop
- Monitoring the club's financial activities and writing funding proposals