Golam Md Muktadir

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Veteran software engineer and manager transforming into an applied scientist, I lead several groups of researchers and actively maintain research projects. I have experience from discovering research questions and developing datasets to modeling solutions and implementing them. My experience in team leadership and collaboration across different teams in the industry helps my current research teams to create feasible research timelines and goals. I would be a great fit as an applied scientist working with pure scientists and engineers.

Education

Ph.D. in Computer Science (*expected graduation Dec 2023***)**
University of California, Santa Cruz (**UCSC**), *Generative AI, LLM, Autonomous Vehicle Simulation.*

M.Sc. in Computer Science
University of California, Santa Cruz (**UCSC**), *Procedural Content Generation, Distributed Data Systems, Data Mining, Evolutionary Game Theory, Computer Vision, Deep Learning, Statistical Learning.*

Bachelor of Science in Computer Science & Engineering
Bangladesh University of Engineering and Technology (**BUET**), *Algorithms, Compiler, Mathematics, Software Engineering, Databases, Embedded Systems, Operating Systems.*

Industry Experience:

- Led and managed software engineering teams through the successful completion of over 200 projects, demonstrating strong leadership and project management skills.
- OCR for Bangla, Bangla Grammer and Spell Checker, Bangla Sign Language Translator, NLP projects, including Machine Translation, Speech-to-Text, Text-to-Speech, and Bangla IPA fonts.
- I have a long experience in the industry. Please refer to ***Industry Experience Here*****.**

Futurewei Technologies, Inc.	*Santa Clara, CA, USA*
Research Intern - Distributed Computing	*Jun 2019 - Aug 2019*
REVE Systems Limited.	*Dhaka, Bangladesh*
Senior Project Manager & Software Architect	*Jun 2016 - Sep 2018*
ICode Bangladesh	*Dhaka, Bangladesh*
CEO	*Dec 2010, June 2016*
Multipay 24 Limited	*Dhaka, Bangladesh*
Freelance Software Architect	*Dec 2010, June 2016*
GetACoder.com, Freelancer.com	*Dhaka, Bangladesh*
Freelance Software Developer	*Dec 2005, Dec 2010*

Skills

Machine Learning and Datamining: Python, R, PyTorch, Keras, Tensorflow, Scikit Learn, Spark, OpenCV, Pandas, Dask, SciPy, Deep Learning, Statistical Learning, Reinforcement Learning, Clustering, Exploratory Data Analysis, Data Cleaning, Feature Engineering, Feature Selection, Prompt Engineering and in-context learning for LLMs.

Software Development: Java, Scala, Kotlin, Typescript, Javascript, Node Js, C#, PHP, Laravel, Unit Testing, Integration Testing, CI/CD, Redis, RabbitMQ, Nats, Celery, Solr, Lucene, CDN, Kubernetes, Docker, DevOps, React, Angular, Android, Springboot, .Net, Laravel, git, Design Patterns, Clean Code, Event-based Architecture, Micro Services, Distributed and Cloud Architectures, Stream Programming, Reactive Programming.

Databases: SQL and NoSQL, MongoDB, MySQL, PostgreSQL, Cassandra, IndexedDB, SQLite, In-memory databases, Transactions.

Management: Risk and Change Management, Project Management, Gantter Chart, UML, Sequence Diagram, Flowcharts, Mermaid, Quality Control, MindMap, MS Project, Scrum, Kanban board, Sprint Plan, Release Plan, Test-driven development (TDD). Behavior-driven development (BDD), Xtreme Programming, Annotation Management, Data development.

Research Projects

1. **Adversarial Jaywalker *[2021 - Current]*:** Adversarial Jaywalker Modeling for Autonomous Vehicle Safety Testing in Simulation. I gained extensive knowledge of pedestrian behavior modeling, which is extremely complex due to the diversity of human behavior. [Github]
2. **Prompt Engineering for Pedestrian Scenario Generation via LLM *[2023]*:** Generating accident scenarios by combining multiple accident scenarios.
3. **In-Context Learning for Product Information via LLMs *[2023]*:** Given an HTML of a purchase history of products, using ChatGPT to extract structured information. [Github]
4. **PedGrid *[2022 - Current]*:** A Simple yet Expressive Simulation Environment for Pedestrian Behavior Modeling for Autonomous Vehicles. Leading a team of high school and college students to create challenging reinforcement learning tasks using OpenAI Gymnasium Framework. [User Guide] [Github]
5. **JunctionArt *[2021 - 2023]*:** New state-of-the-art in the generation of complex roads, intersections, and roundabouts, in collaboration with Ford. [User Guide] [Github]
6. **Hierarchical RL agent in Lux AI challenge *[2023]*:** Attempted Semi-MDP-based RL agent for a turn-based complex strategy game without Experts. [Challenge Info][Github]
7. **PyNS *[2021]***: replacement for NS3 for TCP network congestion research. Built several adaptive agents: [Architecture and Research Results][Github]

8. **Evolutionary World Simulator *[2021]***: Python-based simulator which is needed when one needs to find population evolution with complex real-world rules. [Architecture] [Github]
9. **LANL Earthquake Prediction *[2019]*:** Gained top 5% in LANL project using convolutional neural network (CNN) with an asynchronous data processing pipeline and statistical feature engineering for the huge dataset. [Github]
10. **Classification of Autoimmune Arthritis *[2019]*:** Worked on a real-world dataset that required data-cleaning methods. Built classification models with random forest, neural networks, and SVM. [Github]

Publications:

1. Procedural Generation of High-Definition Road Networks for Autonomous Vehicle Testing and Traffic Simulations. SAE International Journal of CAV, 2022. (*peer-reviewed*)
2. Adversarial Jaywalker modeling for simulation-based testing of Autonomous Vehicle Systems. IEEE Intelligent Vehicles Symposium (IV), 2022. (*peer-reviewed*)
3. Procedural Generation of Complex Roundabouts for Autonomous Vehicle Testing, IEEE Intelligent Vehicles Symposium, Anchorage, Alaska, USA (IV), 2023 (*peer-reviewed*)
4. A Simple yet Expressive Simulation Environment for Pedestrian Behavior Modeling, 26th IEEE International Conference on Intelligent Transportation Systems ITSC, 2023, Bilbao, Bizkaia, Spain. (*peer-reviewed*)
5. P r e -P r i n t Realistic Road Generation: Intersections. 10.13140/RG.2.2.30541.51683. (*preprint*)

Academic Achievements:

- Topped in ML and Data mining classes at UCSC.
- Teaching Assistant for undergraduate and graduate-level Data mining classes at UC Santa Cruz.

Leadership & Management

1. 12-year track record of leading and managing engineering and research teams.
2. Leading a team of 3 high school and 1 college student for the PedGrid research project
3. Leading a team of 2 graduate and 2 college students for autonomous driver modeling at roundabouts using Reinforcement Learning and Carla.
4. Leading a team of 3 graduate students for prompt engineering research for LLM
5. Led a team of 6 for the JuncationArt project

I have a long experience in the industry. Please refer to ***Industry Experience Here*.**

Reference: Professor Jim Whitehead, ejw@ucsc.edu, Associate Dean for Undergraduate Affairs, UC Santa Cruz.