Ismail Hossain

Ph.D. Student | Teaching Assistant | Research Assistant

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Academic Credentials

PhD in Computer Science — *Southern Illinois University Carbondale, IL, USA*
School of Computing's PhD Program — *Fall 2022 – Present*
Fully Funded Scholarship
CGPA: 3.91 out of 4

BS in Computer Science & Engineering — *Chittagong University of Engineering & Technology (CUET)*
Bachelor's degree program — *Mar. 2014 – Nov. 2018*
Major: Computer Science & Engineering
Final CGPA: 3.47 out of 4

Technical Skills

Languages : C, C++, Java, Python, TypeScript
Libraries : Numpy, Pandas, Scikit-learn, Keras, NLTK, Matplotlib
Frameworks : PyTorch, Spring Boot, Node.js, Angular, AgGrid, JUnit, Mokito
Dataset : RDBMS (MySQL, PostgreSQL), NoSQL (Mongo)
Others : RESTful API, Git, GitHub, Swagger, VS Code, Inkscape, Android
Comfortable : Power BI, R, RStudio, GGplot, Anaconda, MatLab, Tensorflow, Keras, Flower, Flask, Selenium, Beautiful-Soup, ReactJs, JavaScript, PHP, C#, HTML, CSS
Familiar : AWS (EC2, Lambda, Cloud9, S3, DynamoDB, SageMaker), Cybersecurity (Nmap, Nessus, Wireshark), Web (Next.js, Express.js, Django), Firebase, Jenkins, GraphQL

Professional Experience

Southern Illinois University Carbondale — *Jan. 2024 - Present*
Teaching Assistant — *Illinois, USA*

- Preparing lecture notes/slides on a given topic
- Conducting theory and lab classes of "Design and Analysis of Algorithms" and "Learning from Data"
- Mentoring both Undergrad and Grad students
- Grading Quizzes, Assignments, Exams, Projects and Presentation

Southern Illinois University Carbondale — *Aug. 2022 – Present*
Research Assistant at SUPREME Lab. — *Illinois, USA*

- Conduct in-depth literature reviews to understand the prior arts
- Collaborate with researchers to design, develop, and optimize algorithms
- Collect and analyze data for experiments, simulations, or data-driven research projects
- Write and maintain code for research projects, including feature engineering, model evaluation, and optimization
- Work with models like Transformers (BERT, GPT), CNN, RNN, LSTM, YOLO, Traditional (KNN, K-means, Random Forest, Decision Tree, Boosting, Bagging)
- Write the research papers at Overleaf collaboratively and prepare the presentations for conferences, and journals
- Assist in training and mentoring junior research assistants, and undergraduate students
- Participate in online Machine Learning and NLP competitions (e.g. Kaggle)
- Led a team for the Cyberforce23 competition

Samsung R&D Institute Bangladesh (SRBD) *Feb. 2019 – Aug. 2022*
Sr. Software Engineer *Dhaka, Bangladesh*

- Specialized in web-based application development tailored for 4G and 5G technologies.
- Proficiently conducted requirement analysis, performed static analysis.
- Demonstrated expertise in enhancing and optimizing legacy software systems.
- Business trip to Suwon, South Korea, for a crucial in-person meeting and the launch of a new module.
- Took ownership of projects, from initiation to completion.
- Achieved remarkable ability to work autonomously with minimal guidance.
- Pioneered innovative ideas and actively participated in patent/ideas generation activities.
- Accomplished over 100+ Jira tasks and resolved more than 50 PLM issues.
- Recognized as the top contributor in August 2022, with an impressive record of over 800+ commits, 100+ pull requests, and 300+ code reviews.

Programming Skill

Online and Onsite Programming Contests *2014 – 2022*
Competitive Progrmmer *Bangladesh*

- Expertise in problem-solving and data structures (LinkedList, Heap, HashMap, Trie Tree, BST, Segment Tree) and Algorithms (Binary Search, Graph Theory, Dynamic Programming, Number Theory).
- Solved 1000+ problems in different Online Judges (e.g. Leetcode, Codeforces, Uva, HackerRank).
- Capability of analyzing program time and memory complexity.
- Participation, National level, Divisional level and ACM International Collegiate Programming Contest (ICPC), Dhaka Regional, 2018.

Achievements

Team rank 16th in the USA and 4th in Illinois **:** U.S. Dept. of Energy CyberForce Competition, 2022
Outstanding Collaborator Award **:** Quarter 1, Samsung R&D Institute, Bangladesh, 2021
Winner, Silver Category **:** Quarter 4, Software Code Review Contest 2020, Network Global R&D Centers, Samsung Electronics
Advance Level Certificate **:** Samsung Global Software Certificate on Competitive Programming Contest, 2019

Research Experience

Conference Papers
Areas: Social Networks, NLP, Federated Learning, Machine Learning, Differential Privacy, Mobile Crowdsourcing

- "EMOVIS: A Visual Approach to Tracking Emotional Sentiment Dynamics in Social Network Commentaries" (**AAAI ICWSM**), Jan 2024 (Lead Author)
- "Monitoring Dynamics of Emotional Sentiment in Social Network Commentaries" (**IEEE/ACM ASONAM**), Nov 2023 (Lead Author)
- "Combating Identity Attacks in Online Social Networks: A Multi-Layered Framework Using Zero-Knowledge Proof and Permissioned Blockchain" (**IEEE/ACM ASONAM**), Nov 2023
- "Towards Addressing Identity Deception in Social Media using Bangla Text-Based Gender Identification" (**IEEE/ACM ASONAM**), Nov 2023
- "Collaborative Differentially Private Federated Learning Framework for the Prediction of Diabetic Retinopathy" (**IEEE ICAIC**), Dec 2022 (Lead Author)
- "Machine Learning and Sentimental Analysis for Predicting Environment Lead Toxicity in Children at the ZIP Code Level" (**IEEE ICAIC**), Dec 2022
- "Towards Federated Learning-based Contraband Detection within Airport Baggage X-Rays" (**IEEE ICMLANT**), Nov 2022
- "An Evolutionary Population Census Application Through Mobile Crowdsourcing" (**Springer ICICO**), Oct 2020 (Lead Author)

Journals

Areas: Machine Learning, NLP, LLM, Generative AI, Cybersecurity

- "Natural Language Processing for Predictive Maintenance in Nuclear Power Plant: Digital Twin Context" (**Transaction of ANS)**, 2024
- "Enhancing the Cybersecurity of Advanced Nuclear Power Plants through Generative AI and Large Language Models" (**Transaction of ANS)**, 2024
- "Blockchain-Integrated Secure Framework for Enhanced E-Government Services" (**Springer Nature**), 2024 (Lead Author)

Book Chapters

Areas: Machine Learning, Healthcare

- "Differentially Private Federated Learning in Medical Context: Phenomenal Classification of Diabetic Retinopathy" (Springer), 2024
- "Introduction of Medical Imaging Modalities" (Springer), 2023
- "Active Learning on Medical Image" (Springer), 2023
- "AutoML Systems For Medical Imaging" (Springer), 2023

Reviewer Experience

Reviewed two research articles on Online & Social Networks and Machine Learning (ASONAM 2023)

Achieved experience with others' paper writing and presenting style that will remind me when writing papers

Undergrad Major Project

Population Census App

Android | Java | Firebase | MCS Technique

- A demo app for national census using mobile crowdsourcing. It includes data collection, worker location tracking via Google Maps, redundancy checks, two-way verification, and real-time result generation.

References

Dr. Sajedul Talukder
Assistant Professor at School of Computing
Director of SUPREME Lab.
https://www2.cs.siu.edu/ stalukder/supremelab/

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