Syed Md Shamsul Alam

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Education

Kennesaw State University — *Georgia, USA*

Graduate Student in Computer Science — *August 2022 - Present*

- **CGPA:** 3.83/4.00
- Graduate Research Assistant
- **Courses:** Advanced Algorithm, Advanced ML, Advanced Database, Parallel and Distributed Computing

Brac University — *Dhaka, Bangladesh*

BSc in Computer Science — *May 2017 - June 2021*

- **CGPA:** 3.65/4.00
- Graduated with Distinction
- **Undergraduate Thesis:** Motif finding using heuristic approach

Publications

A Novel Approach to Driver Drowsiness Detection for Ensuring Safety in an Autonomous Car — *Dhaka, Bangladesh*

Brac University — *May 2022*

- **Springer:** Mobile Networks and Application
- DOI:10.1007/s11036-022-01932-8

An Efficient Meta-heuristic Approach for Finding Motifs from DNA Sequences — *Dhaka, Bangladesh*

Brac University — *December 2021*

- **Conference:** IEEE EICT 2021
- DOI:10.1109/EICT54103.2021.9733453

Work Experience

Kennesaw State University — *Georgia, USA*

Graduate Research Assistant — *August 2022 - Current*

- Work with the text retrieval systems to create optimized searching techniques for IR.
- Collaborate with professor and master students to develop and review search code implementation
- Took Deep Learning with PyTorch class for undergrad and masters students.

Transcom Limited — *Dhaka, Bangladesh*

System Analyst — *December 2021 - July 2022*

- Produced core complex stored procedures and enhance database applications.
- Synthesized current business intelligence data to create reports, polish presentations, highlight findings, and recommend changes.
- Drafted quarterly and yearly reports on company financial metrics to assess successes and account for deficiencies.
- Developed business live report dashboard with Python and MySQL to support financial analysis

CPSD Technologies LTD — *Dhaka, Bangladesh*

AI Engineer Intern — *February 2021 – May 2021*

- Assisted Bangladeshi government's development of face recognition and anti-spoofing for CCTV surveillance
- Collected a collection of face images of individuals for the project and implemented image augmentation techniques to expand sample dataset
- Created MTCNN model for image detection via Tensorflow to recognize facial characteristics and individual attendance
- Coordinated with team members using Github as our version control system to organize modifications and assign tasks

Brac University — *Dhaka, Bangladesh*

Undergraduate Teaching Assistant — *January 2020 - May 2020*

- Courses Taught : MAT110 - Differential Calculus and Coordinate Geometry
- Managed over 100 students in checking quiz scripts and assignments.
- Tutored students during office hours on fundamental concepts and tackled conceptual questions.
- Created problem sets and exams for students to test their cumulative course knowledge and problem-solving capabilities

Research Projects

Hybrid Graph Neural Network for Sentiment Classification on Movie Reviews *Marietta, Georgia*

Kennesaw State University *September 2023 - December 2023*

- Introduced a novel GNN architecture that synergistically combines GCNs, GATs, and RNNs, specifically LSTM and GRU. This hybrid approach allows the model to effectively capture complex semantic relationships and sentiment nuances in text data, which is a considerable advancement over traditional text analysis methods
- We introduced innovative edge formation strategy creating edges in the graph structure. The edges are formed based on both semantic similarity and sentiment alignment. This dual criterion for edge formation is a significant step forward in graph-based learning, enabling a more nuanced understanding of the relationships between different pieces of text.

Learning Semantics on Biomedical Concepts using Graph Representation Learning *Georgia, USA*

Kennesaw State University *May 2023 - October 2023*

- Designed a concept map that interlinks between the heterogeneous concepts and utilized pre-trained input features enhancing the depth and richness of the network.
- Implemented unsupervised GraphSage model to capture the relationships between concepts that result in embeddings effectively bridging the gap between broader and narrower concepts.
- Developed a bilinear model with the concepts that can predict the hypernym-hyponym relationships providing an organized representation of biomedical knowledge space

Global Sentiments: Analyzing News Articles to Understand Public Perceptions in Varied National Conditions *Georgia, USA*

Kennesaw State University *January 2023 - May 2023*

- Designed an automated system combining pre-trained NLP models and a custom sentiment analysis model to process and analyze news stories.
- Implemented the hybrid model to extract the general sentiment and frequently used positive and negative phrases from each news story, gaining insights into the sentiments towards different nations
- Built an online application to visually present sentiment scores, word clouds, and key terms, offering an immediate understanding of each nation's news sentiment.

A RandomWalk Approach for Balancing Nodes in Cloud *Georgia, USA*

Kennesaw State University *January 2023 - May 2023*

- Developed a Secure Random Walk Load Balancer (SRWLB) algorithm to optimize load balancing in cloud systems, considering individual nodes' computational abilities and processing speed to avoid overloading.
- Compared the SRWLB algorithm with the conventional Round Robin Load Balancer (RRLB) in task distribution, resource utilization, and average processing speed, demonstrating the superior performance of the SRWLB.
- Provided a detailed analysis of the trade-offs between SRWLB and RRLB, highlighting the benefits and potential limitations of each, contributing to the development of more efficient load-balancing strategies in cloud computing.

Hybrid Algorithm for Community Detection *Georgia, USA*

Kennesaw State University *September 2022 - December 2022*

- Proposed a hybrid algorithm based on the Girvan-Newman algorithm for clustering directed networks.
- Developed detection of SCC, WCC, and bidirectional subgraphs from directed networks using Python.
- Implemented modularity to extract nodes with the highest betweenness from datasets.

Technical Skills

Programming	Python, C, Java, HTML/CSS, JavaScript, SQL, T-SQL
Developer Tools	PyCharm, VS Code, Eclipse, Jupyter Notebook, Git, UML
Technologies/Frameworks	Windows, Linux, GitHub
Machine Learning Frameworks	PyTorch, Scikit-learn, Keras, Matplotlib, Numpy, Pandas, Langchain
Database Tools	MySQL, Oracle, SSMS, SSRS, SSDS
Miscellaneous	Linux, Shell (Bash/Zsh), LaTeX(Overleaf), Qlik Sense, Microsoft Office, Power BI, Git.

Extra-Curricular Activities

Brac University Computer Club *Dhaka, Bangladesh*

Senior Executive *January 2018 - April 2019*

- Led a team of 10 members to organize and execute club events, including hackathons, coding competitions, and networking events.
- Created and delivered presentations to senior management and external stakeholders, showcasing the club's creative work and its impact
- Managing a team of designers and developers, providing guidance and feedback on their work, and overseeing project timelines and budgets.

IEEE Brac University Student Branch *Dhaka, Bangladesh*

Executive *September 2018 – September 2019*

- Organized and managed technical events, workshops, and seminars for students to promote learning and innovation in technology.
- Maintained effective communication with members, faculty advisors, and other stakeholders to ensure that their needs and expectations are met.
- Provided leadership and guidance to other student members, fostering a culture of collaboration and innovation, and encouraging members to participate in the organization's activities and events.