Md Kowsher

Portfolio: kowsher.github.io

Email: ga.kowsher@gmail.com
Mobile: +1551-300-4127

Education

- **University of Central Florida** — FL, USA
  PhD. in Computer Science; GPA: 4.00/4.00 — *2024 - Present*
  Research Area: *Multi-modal, Computer Vision and Language*

- **Stevens Institute of Technology** — New Jersey, USA
  MSc. in Computer Science; GPA: 4.00/4.00 — *2021 - 2023*
  Research Area: *NLP, LLM and Deep Learning*

Experience

- **Meta**
  Multimodal Intern (Full-time) — *May 2025 - Aug 2025*
  Worked on efficient training of multimodal LLMs; proposed the Universal Winning Slice Hypothesis explaining fine-tuning, transfer learning, domain adaptation, and PEFT, and introduced SliceFine, a theory-grounded PEFT method.

- **University of California, Santa Barbara**
  Visiting Researcher in LLM/VLM Pre-training — *May 2025 – Present*
  Conducting research on efficient pretraining strategies for large language and vision-language models, with a focus on scaling and optimization.

- **Center for Research in Computer Vision Lab**
  Research Assistant in Vision and Language — *August 2024 – Present*
  Engaged in research exploring the intersection of computer vision and natural language processing, focusing on innovative approaches to enhance multi-modal understanding and applications.

- **Nokia Bell Labs**
  Research Scientist Intern in LLM (Full-time) — *June 2024 - August 2024*
  At Nokia Bell Labs, I worked on improving Nokia's language model by developing and testing new methods to make it more accurate and efficient. My focus was on finding better ways for the model to understand and generate language

- **Stevens Institute of Technology**
  Graduate Research Assistant (Full-time) — *August 2021 – June 2024*
  I conducted research in NLP and deep learning, creating a new reservoir transformer to improve NLP tasks and time series forecasting. I built transformer-based models for NLP and worked with a team to publish our research.

- **Amazon**
  Alexa Prize Researcher (Part-time) — *November 2022 – September 2023*
  Achieved second place in the Alexa Prize competition by leading research on large language models and conversation-based image generation. I worked closely with a team of researchers and engineers to develop advanced conversational AI systems.

- **Amazon**
  Applied Scientist Intern (Full-time) — *May 2022 – August 2022*
  At Amazon, I built and tested deep learning models to improve machine learning monitoring systems. I analyzed data, created features to boost AI performance, and worked with teams to deploy AI solutions in production.

- **Hishab Ltd**
  AI Scientist (Full-time) — *April 2020 – August 2021*
  Worked and led a team of data scientists in developing AI-driven solutions for conversational agents and ASR. Developed machine learning models for NLP. Collaborated with clients to understand their business needs and translate them into AI solutions.

- **NKSoft**
  AI Engineer Intern (Full-time) — *November 2019 – May 2020*
  Contributed to the development of NLP module for a chatbot application. Conducted experiments to improve the chatbot's understanding and response generation capabilities. Integrated into the existing software infrastructure.

Publications (Selected)

- **SliceFine: The Universal Winning-Slice Hypothesis for Pretrained Networks: M Kowsher**, A Polat, P Murali, E Ardehaly, C Chen, **ICLR**, 2025 (Under Review), [Link][Code]
- **How Bidirectionality Helps Language Models Learn Better via Dynamic Bottleneck Estimation: M Kowsher**, NJ Prottasha, S Xu, S Mohanto, C Chen, N Yousefi, O Garibay, **ICLR**, 2025 (Under review), [Link][Code]
- **Infinite reservoir transformer:** J Xu, **M Kowsher** **US Patent App.** 18/780,055, 2025, [Link]
- **Predicting Through Generation: Why Generation Is Better for Prediction: M Kowsher**, N Jahan, C Chen, N Yousefi, **ACL (Main)**, 2025 [Link][Code]
- **RoCoFT: Efficient Finetuning of Large Language Models with Rows and Columns Updates: M Kowsher**, T Esmaeilbeig, C Yu, M Soltanalian, N Yousefi, **ACL(Main) & NeurIPS FTML (Oral)**, 2025, [Link][Code]
- **TituLLMs: A Family of Bangla LLMs with Comprehensive Benchmarking:** SK Nahin, RN Nandi, S Sarker, QS Muhtaseem, **M Kowsher**, AC Shill, MI, MH Menon, TA Muntasir, F Alam, **ACL (Finding)**, 2025, [Link][Code]

- **Propulsion: Steering LLM with Tiny Fine-Tuning: M Kowsher**, NJ Prottasha , P.Bhat, The **COLING (Main)**, 2025, [Link][Code]
- **BnTTS: Few-Shot Speaker Adaptation in Low-Resource Setting:** MJI Basher, **M Kowsher**, MS Islam, RN Nandi, NJ Prottasha, SA Chowdhury, F Alam, **NAACL**, 2025, [Link][Code]
- **Llm-Mixer: Multiscale Mixing in LLMs for Time Series Forecasting: M Kowsher**, MSI Sobuj, NJ Prottasha, EA Alanis, OO Garibay, N Yousefi, **ACL TRL**, 2025, [Link][Code]
- **Does Self-Attention Need Separate Weights in Transformers?: M Kowsher**, NJ Prottasha, CN Yu, O Garibay, N Yousefi **NAACL**, 2025, [Link][Model]
- **L-TUNING: SYNCHRONIZED LABEL TUNING FOR PROMPT AND PREFIX IN LLMS : M Kowsher**, MSI Sobuj, A Mahmud, NJ Prottasha, P Bhat, **ICLR**, 2024 (Tiny), [Link][Code]
- **Token Trails: Navigating Contextual Depths in Conversational AI with ChatLLM : M Kowsher**, R Panditi, NJ Prottasha, P Bhat, AK Bairagi, MS Arefin, **NLDB**, 2024, [Link][Model]
- **Parameter-Efficient Fine-Tuning of Large Language Models using Semantic Knowledge Tuning :** NJ Prottasha, A Mahmud, MDS Islam, P Bhat, **M Kowsher**, N Yousefi, OO Garibay, **Scientific Reports, Nature Journal**, 2024, [Link][Code]
- **Contrastive Learning for Universal Zero-Shot NLI with Cross-Lingual Sentence Embeddings: M Kowsher**, MSI Sobuj, NJ Prottasha, MS Arefin, Y Morimoto, **EMNLP Workshop**, 2023, [Link]
- **Bangla-bert: transformer-based efficient model for transfer learning and language understanding: M Kowsher**, AA Sami, NJ Prottasha, MS Arefin, PK Dhar, T Koshiba, **IEEE Access**, 2022, [Link]
- **CARAN: A Context-Aware Recency-Based Attention Network for Point-of-Interest Recommendation:** Md B Hossain, M S Arefin, I H Sarker, **M Kowsher**, P K Dhar, T Koshiba, **IEEE Access**, 2022, [Link]
- **SeqVectorizer: Sequence Representation in Vector Space: M Kowsher**, A Das, MM Hossain Sarker, A Tahabilder, MZ Islam Sanjid Proceedings of the **NIS, ACM**, 2021, [Link]

Skills Summary

- **Languages:** Python, C, C++, Matlab, PHP, Javascript, Fortran, Mathematica
- **Frameworks:** Pytorch, Transformers, Matplotlib, Tensorflow, Keras, Sklearn, NLTK, Pandas, Numpy, Scipy, OpenCV, Rasa, DeepSpeed, Accelerate, PEFT
- **Tools:** Spark, Hadoop, Tableau, Docker, MySQL, Postgresql, LaTeX
- **Platforms:** Linux, Jupyter Notebook,Spyder, PyCharm, Visual Studio, AWS, GCP
- **Soft Skills:** Leadership, Event Management, Writing, Public Speaking, Time Management
- **Other Skills:** Academic Research, Teaching, Competitive Programming

Honors and Awards

- NAACL Travel Award, 2025
- ORCGS Doctoral Fellowship Award (Tuition fee & stipend), University of Central Florida
- Won the second place in Alexa Prize Social Bot Challenge 5, Amazon, USA - 2023
- Awarded Full Membership, Sigma Xi, The Scientific Research Honor Society, USA - 2023
- Graduate Fellowship Award (Tuition fee & stipend), Stevens Institute of Technology, USA - 2021
- Research Excellence Award, Global Innovation & Excellence Award, India - 2021
- Best Paper Award, In. Con. on Cyber Security and Computer Science, Springer - 2020
- Top Wining Award, Coronathon-19, Hackathon on Combating the Coronavirus, Bangladesh - 2020
- Best Paper Award, In. Con. on Computer, Chemical, Materials & Electronic Engineering, IEEE. - 2019
- Champion Award Robi r-ventures 2.0, Robi Axiata Limited - 2019
- National BASIS ICT Award - 2019

Volunteer Experience

- **Conference Reviewer:** ACL(2025), NAACL(2025), ICLR(2024), EMNLP (2023), IJCNN(2024), ICEICT (2023, 2022), ICDM (2023), ICCIDM (2022, 2021), ICMLIS (2022), ICSECS (2021), ICoCSIM (2021), MIET(2022), MLIS(2022), CDPCS(2022), ICMSOA(2021)
- **Journal Reviewer:** Scientific Reports, Nature (2022 - 2024), IEEE Access, IEEE (2022 - 2024), Electronics, MDPI (2023, 2022), Visual Computing for Industry, Biomedicine, and Art, Springer Journal (2023, 2022), Big Data and Information Analytics , Springer (2023, 2022), Applied Artificial Intelligence,Taylor and Francis (2023, 2022), Sensors, MDPI (2023, 2022), Applied Sciences, MDPI (2023, 2022)

Teaching Experience

- **Teaching Assistant** — Stevens Institute of Technology
  CS-541-Artificial Intelligence — *Jan 2024 - May 2024*
- **Teaching Assistant** — Stevens Institute of Technology
  CS-583-Deep Learning — *Sept 2022 - Dec 2023*
- **Teaching Assistant** — Stevens Institute of Technology
  CS 800-Special Research Problem — *Jan 2023 - May 2023*