Rashik Rahman

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Objective

As a dedicated scholar, I investigate the possible benefits of AI technology to enhance human life. My areas of expertise include deep learning, computer vision, and the design and implementation of research tools. My primary purpose is to develop widely implementable deep learning-based solutions for real scenarios.

Professional Experience

University of Calgary — Calgary, Alberta, CA
Teaching Assistant — January 2024 – January 2026
Assisted in the following courses:

- CPSC 217: Introduction to computer science for multidisciplinary studies I
- CPSC 413: Design and Analysis of Algorithms I
- SENG 513: Web Based Systems

University of Calgary — Calgary, Alberta, CA
Research Assistant — January 2024 – January 2026
As a part of the role, I worked on the following projects:

- Distributed Privacy-Preserving Self-Supervised Deep Learning for Semantic Segmentation
- Developing Novel Evaluation Function for Semantic Segmentation
- Cardiac CT Data Annotation

University of Asia Pacific — Dhaka, Bangladesh
Lecturer — July 2022 – Present
Conducted the following courses:

- Structured Programming
- Data Structure and Algorithms
- Numerical Methods
- Computer Graphics
- Software Engineering
- Algorithms
- Operating Systems
- Machine Learning

SammTech — Dhaka, Bangladesh
Data Scientist — August 2021 – June 2022

- Played a lead role for development and integration of TinyML in smart devices.
- Developed a novel approach for recognizing plant diseases using CNN and TinyML. Made the model 12 times lighter in flash consumption, 11 times faster in inference time and the model consumes 11 times less energy when compared to the initially developed float32 model. The proposed model achieved a f1-score of 98
- Developed an end-to-end license plate detection and recognition system using TinyML and integrated it in raspberry pi. TinyML model achieved accuracy of 98% and inference time was decreased by half resulting in 50% increase in real-time performance.

Quantum.ai — Dhaka, Bangladesh

AI Engineer February 2021 – April 2021

- Developed a deep learning-based baseline solution for resume filtering by text extraction and analysis.

Education

MSc **University of Calgary**, Computer Science — January 2024 – January 2026

- GPA: 3.92 of 4

BSc **University of Asia Pacific**, Computer Science and Engineering — October 2017 – December 2021

- GPA: 3.86 of 4 | Ranked 4th in class of 110 students with distinction
- Thesis Title: A Real-time End-to-End Bangladeshi License Plate Detection and Recognition System for All Situations Including Challenging Environmental Scenarios.
- As the outcome of this thesis two conference papers were published.

Technical Skills

- **AI:** machine learning and deep learning algorithms (CNN, RNN, TinyML, Federated Learning, SSL, SVM, KNN, DTree, e.t.c), Predictive modeling, and data and statistical analysis.
- **Packages:** Keras, TensorFlow, Sci-kit learn, OpenCV.
- **Cloud**: GCP, IBM Watson.
- **Analytical tools:** Power BI, Tableau.
- **Data structures and algorithms:** Data structures, Graph Theory, Trees.
- **Programming Language:** C, C++, Java, Python, R, Octave.
- **Other technical skills:** Git, Latex, Arduino, ESP-32, and Raspberry PI

Publications (citations: 216, h-index: 9)

- **Rahman, R.**, Murad, H., Rahman, N. N., Saha, A. K., Al Masud, S. M. R., & Momtaz, A. Z. (2022). CapNet: An Encoder-Decoder based Neural Network Model for Automatic Bangla Image Caption Generation. International Journal of Advanced Computer Science and Applications, 13(8).
- **Rahman, R.**, Rakib, A. F., Rahman, M., Helaly, T., & Pias, T. S. (2021, November). A real-time end-to-end Bangladeshi license plate detection and recognition system for all situations including challenging environmental scenarios. In 2021 5th International Conference on Electrical Engineering and Information Communication Technology (ICEEICT) (pp. 1-6). IEEE.
- **Rahman, R.**, Pias, T. S., & Helaly, T. (2020, October). Ggcs: A greedy graph-based character segmentation system for bangladeshi license plate. In 2020 4th International Symposium on Multidisciplinary Studies and Innovative Technologies (ISMSIT) (pp. 1-7). IEEE.
- Mahi, A. B. S., Eshita, F. S., Chowdhury, T., **Rahman, R.**, & Helaly, T. (2024). VID: A comprehensive dataset for violence detection in various contexts. Data in Brief, 57, 110875.
- Gupta, S., Bhuiyan, M. R. I., Chowa, S. S., Montaha, S., **Rahman, R.**, Mehedi, S. T., & Rahman, Z. (2024). Enhancing Autism Spectrum Disorder Classification with Lightweight Quantized CNNs and Federated Learning on ABIDE-1 Dataset. Mathematics, 12(18), 2886.
- Rahman, N. N., **Rahman, R.**, Jahan, N., & Adnan, M. A. (2024). Unveiling Diagnostic Precision: Evaluating Machine Learning and Deep Learning Approaches for Pneumonia Recognition of COVID-19 Patients Using Chest X-Rays. In Data-Driven Clinical Decision-Making Using Deep Learning in Imaging (pp. 61-81). Singapore: Springer Nature Singapore.
- Nazir, M. I., Mazumder, T., Islam, M. M., Ehsan, M. A., **Rahman, R.**, & Helaly, T. (2024, April). Enhancing Autism Spectrum Disorder Diagnosis through a Novel 1D CNN-Based Deep Learning Classifier. In 2024 3rd International Conference on Advancement in Electrical and Electronic Engineering (ICAEEE) (pp. 1-6). IEEE.
- Tonmoy, M. R., Rakib, A. F., **Rahman, R.**, Adnan, M. A., Mridha, M. F., Huang, J., & Shin, J. (2024). A Lightweight Visual Font Style Recognition With Quantized Convolutional Autoencoder. IEEE Open Journal of the Computer Society.

- Rakib, A. F., **Rahman, R.**, Razi, A. A., & Hasan, A. T. (2024). A lightweight quantized CNN model for plant disease recognition. Arabian Journal for Science and Engineering, 49(3), 4097-4108.
- Bakshi, A., Mehnaz, M., **Rahman, R.**, & Begum, N. (2023, November). Comprehensive Performance Analysis of Machine Learning Models in Fall Detection Using Gait Data. In 2023 IEEE 9th International Women in Engineering (WIE) Conference on Electrical and Computer Engineering (WIECON-ECE) (pp. 479-484). IEEE.
- Saha, A. K., Arnob, N. M. K., Rahman, N. N., Haque, M., Al Masud, S. M. R., & **Rahman, R.** (2023). Mukh-Oboyob: Stable Diffusion and BanglaBERT Enhanced Bangla Text-to-Face Synthesis. International Journal of Advanced Computer Science & Applications, 14(11).
- Al Masud, S. M. R., Adiba, H., Hossain, T., Saha, A. K., & **Rahman, R.** (2023). Development of interactive data visualization system in three-dimensional immersive space. International Journal of Advanced Computer Science and Applications, 14(10).
- Hasib, A., Eva, J. F., Khan, S. S., Khatun, M. N., Haque, A., Shahrin, N., ... & Hussein, M. R. (2023). BDSL 49: A comprehensive dataset of Bangla sign language. Data in Brief, 49, 109329.
- Tusher, M. S. R., Rahman, N. N., Chowdhury, S., Tabassum, A., Adnan, M. A., **Rahman, R.**, & Al Masud, S. M. R. (2023). An enhanced variational autoencoder approach for the purpose of deblurring bangla license plate images. International Journal of Advanced Computer Science and Applications, 14(6), 10-14569.
- Arnob, N. M. K., Rahman, N. N., Mahmud, S., Uddin, M. N., **Rahman, R.**, & Saha, A. K. (2023). Facial Image Generation from Bangla Textual Description using DCGAN and Bangla FastText. International Journal of Advanced Computer Science and Applications, 14(6).
- Begum, N., Khan, S. S., **Rahman, R.**, Haque, A., Khatun, N., Jahan, N., & Helaly, T. (2023). QMX-BdSL49: An Efficient Recognition Approach for Bengali Sign Language with Quantize Modified Xception. International Journal of Advanced Computer Science and Applications, 14(5).
- Murad, H., & **Rahman, R.** (2023). AI Poet: A Deep Learning-based Approach to Generate Artificial Poetry in Bangla. In Applied Intelligence for Industry 4.0 (pp. 188-197). Chapman and Hall/CRC.
- Begum, N., **Rahman, R.**, Jahan, N., Khan, S. S., Helaly, T., Haque, A., & Khatun, N. (2023). Borno-net: a real-time Bengali sign-character detection and sentence generation system using quantized Yolov4-Tiny and LSTMs. Applied Sciences, 13(9), 5219.
- Nusrat, F., Bristy, J. B., Khandoker, R., Helaly, T., & **Rahman, R.** (2022, December). Automatic Bangla Signboard and Region of Text Interests Detection from Natural Scene. In 2022 International Conference on Recent Progresses in Science, Engineering and Technology (ICRPSET) (pp. 1-5). IEEE.
- Murad, H., Al Razi, A., & **Rahman, R.** (2022, October). Colornet: A deep learning-based approach to colorize the historical documentaries of bangladesh. In Proceedings of International Conference on Fourth Industrial Revolution and Beyond 2021 (pp. 3-14). Singapore: Springer Nature Singapore.
- Amiruzzaman, M., **Rahman, R.**, Islam, M. R., & Nor, R. M. (2022). Logical analysis of built-in dbscan functions in popular data science programming languages. MIST International Journal of Science and Technology, 10, 25-32.
- Rahman, M., **Rahman, R.**, Supty, K. A., Sabah, R. T., Islam, M. R., Islam, M. R., & Ahmed, N. (2022, March). A real time abysmal activity detection system towards the enhancement of road safety. In 2022 2nd International Conference on Innovative Research in Applied Science, Engineering and Technology (IRASET) (pp. 1-5). IEEE.
- Karim, A. Z., Miah, M. S., Jamal, G. A., Fahima, R. A., & **Rahman, R.** (2022, February). Effect of Number of Modes of EMD in Respiratory Rate Estimation from PPG Signal. In 2022 International Conference on Advancement in Electrical and Electronic Engineering (ICAEEE) (pp. 1-6). IEEE.
- Amiruzzaman, M., **Rahman, R.**, Islam, M. R., & Nor, R. M. (2021, November). Evaluation of DBSCAN algorithm on different programming languages: An exploratory study. In 2021 5th International Conference on Electrical Engineering and Information Communication Technology (ICEEICT) (pp. 1-6). IEEE.
- Maraz, M. R. J., **Rahman, R.**, Hasnain, M. M. U., & Murad, H. (2021, September). A cross-platform blood donation application with a real-time, intelligent, and rational recommendation system. In 2021 International Conference on Electronics, Communications and Information Technology (ICECIT) (pp. 1-4). IEEE.

Projects

PNEUMONIA CLASSIFICATION OF COVID PATIENTS FROM CHEST X-RAY

- Developed a CNN model to recognize pneumonia from chest x-ray of covid patients. Also the model is implemented in web-end for ease of use. Model accuracy was 99%.

PLANT PATHOLOGY RECOGNITION WITH PYWEBIO

- Used a CNN to build the deep learning model for recognition and used PyWebIO & flask for a web end interface. Model accuracy was over 91%.

SENTIMENT CLASSIFICATION WITH PYTORCH & FASTAPI

- This is a binary text classification project. Used PyTorch to create the model with help of tez wrapper. After that I used FastApi to deploy the model.

SALES INSIGHTS USING POWERBI

- A XYZ company was suffering from a sales decline. So my task was to design a dynamic intuitive dashboard from their database so that they can easily understand their sales insights and take important business decisions.

AN EDA OF DATA SCIENCE JOBS ON GLASSDOOR

- After scraping the data from glassdoor an intensive analysis of data science jobs was illustrated.

BOLLYWOOD MOVIE RECOMMENDATION ENGINE

- Developed a content-based bollywood movie recommendation engine. The data was web scrapped from using beautifulsoup.

See more

Awards and Achievements

- **Alberta Graduate Excellence Scholarship (AGES)** - 2024, University of Calgary, AB, CA.
- **International Graduate Tuition Award** - 2024-2025, University of Calgary, AB, CA.
- **International Graduate Recruitment Award** - 2024, University of Calgary, AB, CA.
- **Vice Chancellor's Award** - 2019, University of Asia Pacific, Dhaka, Bangladesh.
- **Vice Chancellor's Award** - 2018, University of Asia Pacific, Dhaka, Bangladesh.
- **Host Volunteers Coordinator** - 2022, ICPC World Finals Dhaka.

Conducted Workshops and Webinars

- **A To Z Tricks of Data Science & Machine Learning** - March 2021 (Hosted by Daffodil International University).
- **Workshop on a Beginner's Guide to start ML, Projects, Cracking ML Production Pipeline** - April 2021 (Hosted by Dhaka University of Engineering and Technology).
- **Industrial Project On Machine Learning** - Dec 2021 (Hosted by the University of Asia Pacific).
- **Real-Life Data processing for Industrial Projects with Machine Learning** - March 2022 (Hosted by United International University).

Certifications

- **DeepLearning.AI TensorFlow Advanced Techniques** - April 2022 (Coursera)
- **DeepLearning.AI TensorFlow Developer** - Jul 2021 (Coursera)
- **Advanced Machine Learning on Google Cloud** - Jan 2021 (Coursera)
- **Machine Learning with TensorFlow on Google Cloud** - Oct 2020 (Coursera)
- **IBM Data Science Professional Certificate** - May 2020 (Coursera).

See more

References

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    - **Professor, Department of Computer Science and Engineering, University of Asia Pacific**
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