

# Mir Sazzat Hossain

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## Education

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### Independent University, Bangladesh

Jan 2017 – May 2021

*Bachelor of Science in Computer Science and Engineering*

*Dhaka, Bangladesh*

*Minor in Engineering Mathematics*

*CGPA: 3.64 / 4.00*

## Research Experience

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### Junior Research Scientist

Jul 2024 – Present

*Center for Computational & Data Sciences, Independent University, Bangladesh*

*Dhaka, Bangladesh*

- Developing a pip package for radio image processing and a dataset of NAT and WAT galaxies.
- Working on several projects, including domain adaptation, mixtures of experts in large multi-modal models (LMMs), protein dynamics prediction using 3D CNNs, and particle jet tagging using graph neural networks.

### Post-baccalaureate Research Assistant

Feb 2022 – Jun 2024

*Center for Computational & Data Sciences, Independent University, Bangladesh*

*Dhaka, Bangladesh*

- Developed a recurrent neural network-based model for image super-resolution, published in ICIP 24.
- Implemented a semi-supervised equivariant CNN for radio galaxy classification as part of a project funded by the ICT Division, Government of Bangladesh, published in IJCNN 2023.
- Conducted tutorials and provided lab support for Programming, Data Structures, AI, and ML.
- Mentored undergraduate students on implementation and write-up for their final thesis projects.

## Teaching Experience

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### Post-baccalaureate Teaching Assistant

May 2021 – Jan 2022

*Independent University, Bangladesh, Dept. of Computer Science and Engineering*

*Dhaka, Bangladesh*

- Redesigned the lab materials for the Numerical Methods course using Python.
- Provided programming support and addressed student queries during lab sessions for Neural Networks and Data Mining course.

### Undergraduate Teaching Assistant

Oct 2019 – Apr 2021

*Independent University, Bangladesh, Department of Physical Sciences*

*Dhaka, Bangladesh*

- Offered one-on-one tutoring to struggling students from various disciplines at Math Tutorial Center.
- Worked with other tutors to manage the center and make sure students got the support they needed.

## Publications and Preprints

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- **Mir Sazzat Hossain**, AKM Mahbubur Rahman, Md. Ashraful and Amin Amin Ahsan Ali. “**Lightweight Recurrent Neural Network for Image Super-Resolution**” 2024 IEEE International Conference on Image Processing (ICIP), Abu Dhabi, United Arab Emirates, 2024, pp. 1567-1573, doi: 10.1109/ICIP51287.2024.10647844
- **Mir Sazzat Hossain**, Sugandha Roy, K M B Asad, Arshad Momen, Amin Ahsan Ali, M Ashraful Amin and A K M Mahbubur Rahman. “**Morphological Classification of Radio Galaxies Using Semi-Supervised Group Equivariant CNNs**” in *Procedia Computer Science*, vol. 222, pp. 601-612, 2023, ISSN: 1877-0509, DOI: <https://doi.org/10.1016/j.procs.2023.08.198>. [Paper]
- **Mir Sazzat Hossain**, K M B Asad, Payaswini Saikia, Arshad Momen, Amin Ahsan Ali, M Ashraful Amin, Jewel Kumar Ghosh and A K M Mahbubur Rahman. “**RGC: Exploring Bent Galaxies - Semi-Supervised Classification via Equivariant CNN**” in preparation to submit in *Astronomy & Astrophysics Journal*.

## Selected Projects

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### Predicting Restaurant Orders with USTGCN

January 2021

- Built a tool to forecast the number of orders a restaurant would receive the next day based on the last 7 days of order data, using a unified spatio-temporal graph convolutional network. [Github]

### RGC - Python Package

November 2020

- Created a Python package for preprocessing radio signals received from radio telescopes to produce clean, noise-free images and classify them using established machine learning models. [Github]

## Awards and Honors

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- Received the **IEEE Signal Processing Society Travel Grant** of **US \$1,000** for joining the **2024 IEEE ICIP** in Abu Dhabi, UAE (October 27-30). [Credentials]
- Placed on the Vice Chancellor's List at IUB three times (Spring 2021, Autumn 2020, Summer 2020) for maintaining a GPA of 3.50 or above for three consecutive semesters. [Credentials]
- Made the Dean's Merit List at IUB in Spring 2020 for achieving a CGPA of 3.50 or higher for two consecutive semesters. [Credential]
- Achieved a spot on the Dean's List at IUB in Autumn 2019 for obtaining a CGPA of 3.50 or more in that semester. [Credential]

## Extracurricular Activities

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- Represented IUB in The 2019 ICPC Asia Dhaka Regional Contest. [Credential]
- Winner of the Intra IUB Tech Fest Programming Contest, Summer 2019. [Credential]
- Winner of the 2019 Intra IUB ACM Week Code Debugging Contest. [Credential]
- Actively participated in various workshops, programming contests, and Olympiads. [Credentials]

## Relevant Coursework

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Artificial Intelligence, Machine Learning, Image Processing, Numerical Methods, Linear Algebra and Differential Equation, Calculus II (Multivariable Calculus), Ordinary Differential Equation, Boundary Value Problem

## Standardized Tests

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- **IELTS:** Overall 7.0 (Reading - 6.5, Listening - 8.5, Speaking - 6.5, Writing - 6.0)

## Technical Skills

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- **Languages:** Python, C++, C, JavaScript
- **Libraries:** PyTorch, PyTorch-Lightning, TensorFlow, Scikit-learn, Keras
- **Web Frameworks:** NextJs, React, Django, Laravel
- **Miscellaneous:** Git, Docker, MATLAB,  $\text{\LaTeX}$

## References

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### Md Ashraful Amin, PhD

*Professor*

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### Amin Ahsan Ali, PhD

*Associate Professor*

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### A K M Mahbubur Rahman, PhD

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