

# Md Ashiqur Rahman

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## Education

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| <b>Purdue University</b><br><i>Doctor of Philosophy in Computer Science</i><br>Advisor: Raymond A. Yeh   | <b>West Lafayette, IN</b><br>2021–    |
| <b>Purdue University</b><br><i>Master of Science in Computer Science</i><br>Advisor: Raymond A. Yeh  | <b>West Lafayette, IN</b><br>2025     |
| <b>Bangladesh University of Engg &amp; Tech</b><br><i>Bachelor of Science in Computer Science and Engineering</i><br>Advisor: Md. Shamsuzzoha Bayzid | <b>Dhaka, Bangladesh</b><br>2015–2019 |

## Professional Employment

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| <b>Purdue University</b><br><i>Graduate Assistant in the Department of Computer Science</i> <ul style="list-style-type: none"><li>Teaching Assistant for courses on deep learning and computer graphics.</li></ul>          | <b>West Lafayette, IN</b><br>2021–present |
| <b>Autodesk</b><br><i>Research Intern</i><br>Manager: Robert Giaquint <ul style="list-style-type: none"><li>Researched CAD model generation with large vision language models (VLMs).</li></ul>                             | <b>San Francisco, CA</b><br>Summer 2025   |
| <b>NVIDIA</b><br><i>Research Intern</i><br>Manager: Anima Anandkumar <ul style="list-style-type: none"><li>Researched large-scale weather prediction and foundation model for scientific computing.</li></ul>               | <b>Santa Clara, CA</b><br>Summer 2023     |
| <b>United International University</b><br><i>Lecturer in the Department of Computer Science</i> <ul style="list-style-type: none"><li>Taught courses on computer graphics, networking system, and data structure.</li></ul> | <b>Dhaka Bangladesh</b><br>2019–2021      |

## Research Experience

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### Geometric Deep Learning

- Conducted research on developing robust machine learning models under geometric transformations.
- Developed a scale-equivariant computer vision model that demonstrates robustness to image resizing (Published at NeurIPS 2023).
- Introduced an anti-aliasing operator for group-equivariant computer vision models (ICLR 2025, under review).
- Currently working on designing equivariant models for local group actions.

### Operator Learning

- Developed efficient U-shaped neural operators for learning in function spaces (Published in TMLR 2023).
- Created a generative adversarial neural operator that extends GANs from finite-dimensional to function spaces (Published in TMLR 2023).

### Scientific Computing

- Developed a codomain attention neural operator to solve complex multi-physics partial differential equations (Published at NeurIPS 2024).
- Contributed to large-scale weather modeling and the development of a foundation model for scientific computing during a summer internship at Nvidia (2023).

### Vision-Language Models

- Currently working on utilizing language information for geometric vision tasks, such as symmetry detection (Under review at CVPR 2025).

## Publications

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### Refereed Conference

- [C1] **Md Ashiqur Rahman**, Chiao-An Yang, Michael N. Cheng, Jun Hao Lim, Jeremiah Jiang, Teck-Yian Lim, and Raymond A. Yeh. Local scale equivariance with latent deep equilibrium canonicalizer. In *Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV)*, 2025.
- [C2] Tinghan Yang, **Md Ashiqur Rahman**, and Raymond A. Yeh. Clipsym: Delving into symmetry detection with clip. In *International Conference on Computer Vision (ICCV)*, 2025.
- [C3] **Md Ashiqur Rahman** and Raymond A. Yeh. Group downsampling with equivariant anti-aliasing. In *International Conference on Learning Representations (ICLR)*, 2025.
- [C4] **Md Ashiqur Rahman**, R. J. George, M. Elleithy, D. Leibovici, Z. Li, B. Bonev, C. White, J. Berner, R. A. Yeh, J. Kossaifi, K. Azizzadenesheli, and A. Anandkumar. Pretraining codomain attention neural operators for solving multiphysics PDEs. In *Advances in Neural Information Processing Systems (NeurIPS)*, 2024.
- [C5] **Md Ashiqur Rahman** and Raymond A. Yeh. Truly scale-equivariant deep nets with fourier layers. In *Advances in Neural Information Processing Systems (NeurIPS)*, 2023.
- [C6] **Md Ashiqur Rahman**, Abdullah Aman Tutul, and A. B. M. Alim Al Islam. Solving the maze of diagnosing parkinson's disease based on portable eeg sensing to be adaptable to go in-the-wild. *Proceedings of the 7th International Conference on Networking, Systems and Security*, 2020. (Best Paper Award).
- [C7] Akm Ashiquzzaman, Abdul Kawsar Tushar, **Md Ashiqur Rahman**, and Farzana Mohsin. An efficient recognition method for handwritten arabic numerals using cnn with data augmentation and dropout. *Data Management, Analytics and Innovation*, 2018.

### Refereed Journal

- [J1] **Md Ashiqur Rahman**, Abdullah Aman Tutul, Mahfuza Sharmin, and Md. Shamsuzzoha Bayzid. Beene: deep learning-based nonlinear embedding improves batch effect estimation. *Bioinformatics*, 2023.
- [J2] **Md Ashiqur Rahman**, Manuel A. Florez, Anima Anandkumar, Zachary E. Ross, and Kamyar Azizzadenesheli. Generative adversarial neural operators. *Transactions on Machine Learning Research*, 2022.
- [J3] **Md Ashiqur Rahman**, Zachary E. Ross, and Kamyar Azizzadenesheli. U-no: U-shaped neural operators. *Transactions on Machine Learning Research*, 2022.
- [J4] **Md Ashiqur Rahman**, Abdullah Aman Tutul, Sifat Muhammad Abdullah, and Md. Shamsuzzoha Bayzid. Chapao: Likelihood and hierarchical reference-based representation of biomolecular sequences and applications to compressing multiple sequence alignments. *PLoS ONE*, 2022.

### Preprints / In Submission

- [S1] Hrishikesh Viswanath, **Md Ashiqur Rahman**, Abhijeet Vyas, Andrey Shor, Beatriz Medeiros, Stephanie Hernandez, Suhas Eswarappa Prameela, and Aniket Bera. Neural operator: Is data all you need to model the world? an insight into the impact of physics informed machine learning. 2023.

- [S2] **Md Ashiqur Rahman**, Jasorsi Ghosh, Hrishikesh Viswanath, Kamyar Azizzadenesheli, and Aniket Bera. Pacmo: Partner dependent human motion generation in dyadic human activity using neural operators. *ArXiv*, abs/2211.16210, 2022.
- [S3] Hrishikesh Viswanath, **Md Ashiqur Rahman**, Rashmi Bhaskara, and Aniket Bera. Adafnio: Adaptive fourier neural interpolation operator for video frame interpolation. 2022.

## Talks

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### Neural Operators for Solving PDEs

- Invited Talk at the Department of CSE, Lehigh University. Host: Maryam Rahnemoonfar 2025

## Services

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Conference Reviewer: NeurIPS, ICLR, ICML, CVPR