

Rasel Ahmed Bhuiyan

(574) 993-4750 | Notre Dame, IN | rbhuiyan@nd.edu | [linkedin.com/in/rabhuiyan/](https://www.linkedin.com/in/rabhuiyan/) | [Google Scholar](https://scholar.google.com/citations?user=8YUW8wYAAAAJ)

EDUCATION

Ph.D. Computer Science – University of Notre Dame, Notre Dame, IN	12/2026
Focus: Iris recognition and its forensic applications Advisor: Adam Czajka	
M.Sc. Computer Science – University of Notre Dame, Notre Dame, IN	05/2024
Focus: Forensic Iris Recognition CGPA: 3.83/4.00	
B.Sc. Computer Science & Engineering – University of Asia Pacific, Dhaka, BD	03/2018
Degree awarded with highest distinction CGPA: 3.94/4.00	

EXPERIENCE

University of Notre Dame	Notre Dame, IN
<i>Graduate Research Assistant, Computer Vision Research Laboratory (CVRL)</i>	01/2023 - Present
<ul style="list-style-type: none">Developed deep learning models for PMI estimation from iris images using NIR, RGB, and fusion (RGB+NIR) data. Evaluated models across sample-disjoint, subject-disjoint, and cross-dataset scenarios, achieving significant improvements by supplementing limited and non-representative real data with synthetically-generated data, reducing the Mean Absolute Error (MAE) from approximately 77.66 hours to 45.77 hours [1].Developed a segmentation model capable of segmenting diverse iris types and conducted a feasibility study on iris recognition for infants. Our segmenter, combined with state-of-the-art encoders, achieved a remarkable reduction in the Equal Error Rate (EER) from 31% to 3% and increased the AUC from 77% to 99%. [2].Conducted an extensive survey highlighting the limitations of existing forensic iris recognition datasets, capturing sensor, and the absence of post-mortem interval (PMI) estimation models from forensic iris images [3].Developed a StyleGAN2-based model conditioned on PMI to generate synthetic forensic iris images, providing a novel dataset categorized into 18 PMI ranges, each with 10,000 images representing 1,000 synthetic identities [4].	
University of Notre Dame	Notre Dame, IN
<i>Graduate Teaching Assistant, Department of Computer Science and Engineering</i>	01/2022 - 12/2022
<ul style="list-style-type: none">Contributed to course development, conducted office hours, facilitated discussions, and provided feedback for CSE 60868 Neural Networks, CSE 20312 Data Structures, and CSE 30332 Programming Paradigms.	
Uttara University	Dhaka, Bangladesh
<i>Lecturer, Department of Computer Science and Engineering</i>	08/2018 - 12/2021
<ul style="list-style-type: none">Taught courses including Algorithms, Machine Learning, and Digital Logic Design.	

PROJECTS

Iris Data Analysis Toolkits <i>PyTorch, Scikit-Learn, OpenCV, Pillow, Pandas</i>	03/2024 - 08/2024
<ul style="list-style-type: none">Developed a robust iris segmentation model capable of handling various iris types. Used PyTorch for model development and Scikit-Learn for data pre-processing. Leveraged OpenCV, Pillow, and Pandas for data visualization, and evaluation of iris biometric data. GitHub	
Iris Presentation Attack Detection <i>PyTorch, Scikit-Learn, Pillow</i>	05/2024 - 07/2024
<ul style="list-style-type: none">Developed a model to detect presentation attacks in iris images using PyTorch. Employed Scikit-Learn for data pre-processing and evaluation, and utilized Pillow for image handling. GitHub	
Hand Gesture Recognition <i>PyTorch, Scikit-Learn, CVZONE, OpenCV</i>	08/2023 - 12/2023
<ul style="list-style-type: none">Developed a real-time system for hand gesture recognition using deep learning models in PyTorch. Implemented hand tracking with CVZONE and image processing with OpenCV. Evaluated model performance with Scikit-Learn, demonstrating high accuracy in gesture detection. GitHub	

TECHNICAL SKILLS

Programming Languages: Python, MATLAB, C++ (basic proficiency)
Libraries and Tools: PyTorch, TensorFlow, Scikit-learn, Pandas, OpenCV, Pillow, NumPy, Matplotlib, Git, L^AT_EX
ML Architectures: MLP, CNN, RNN, LSTM, VGG, ResNet, DenseNet, Inception, U-Net, GANs, Diffusion Models
Concepts: Artificial Intelligence, Machine Learning, Deep Learning, Computer Vision, Neural Networks, Transformers, Autoencoders, Self-supervised Learning, Generative AI, Multimodal Learning, Transfer Learning, Statistics
Techniques: Segmentation, Classification, Regression, Object Detection, Feature Extraction, Dimensionality Reduction, Data Analysis, Statistical Analysis, Data Visualization, Multi-GPU Training

- 1 **Rasel Ahmed Bhuiyan** and Adam Czajka, “Forensic Iris Image-Based Post-Mortem Interval Estimation”, Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (WACV), Tucson, Arizona, 2025.
- 2 **Rasel Ahmed Bhuiyan** and Adam Czajka, “Iris Recognition for Infants”, Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (WACV), Tucson, Arizona, 2025.
- 3 **Rasel Ahmed Bhuiyan** and Adam Czajka, “Forensic Iris Recognition: A survey”, Journal of Forensic Identification, vol. 74, no. 1, pp. 38, 2024.
- 4 **Rasel Ahmed Bhuiyan** and Adam Czajka, “Forensic Iris Image Synthesis”, Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (WACV), Waikoloa, Hawaii, 2024.
- 5 **Rasel Ahmed Bhuiyan**, Shams Tarek, and Hongda Tian, “Enhanced Bag-of-Words Representation for Human Activity Recognition using Mobile Sensor Data”, Signal, Image and Video Processing (SIViP), Springer Nature, 1–8, 2021.
- 6 **Rasel Ahmed Bhuiyan**, N Ahmed, Md Amiruzzaman, and MR Islam, “A Robust Feature Extraction Model for Human Activity Characterization using 3-Axis Accelerometer and Gyroscope Data”, Sensors, MDPI, 20(23):6990, 2020.
- 6 A Matin, **Rasel Ahmed Bhuiyan**, SR Shafi, AK Kundu, and MU Islam, “A Hybrid Scheme Using PCA and ICA Based Statistical Feature for Epileptic Seizure Recognition from EEG Signal”, Joint 2019 IEEE 8th International Conference on Informatics, Electronics, and Vision (ICIEV) and 3rd International Conference on Imaging, Vision, and Pattern Recognition (IVPR), Eastern Washington University, USA, 2019. [**Nominated for the best paper award**]
- 8 MR Islam, UK Mitu, **Rasel Ahmed Bhuiyan**, and J Shin, “Hand Gesture Feature Extraction Using Deep Convolutional Neural Network for Recognizing American Sign Language”, 2018 IEEE 4th International Conference on Frontiers of Signal Processing (IEEE-ICFSP), France, 2018.
- 9 **Rasel Ahmed Bhuiyan**, AK Tushar, A Ashiquzzaman, J Shin, MR Islam, “Reduction of gesture feature dimension for improving the hand gesture recognition performance of numerical sign language”, 2017 IEEE 20th International Conference of Computer and Information Technology (IEEE-ICCIT), Bangladesh, 2017.