

# Oishee Bintey Hoque

PhD Student, University of Virginia

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## EDUCATION

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### University of Virginia

*Doctor of Philosophy, Computer Science*

Current GPA: 3.82

**Relevant Courses:** Machine Learning, Machine Learning in Image Processing, Interpretable Machine Learning, Topics in Reinforcement Learning

### Ahsanullah University Of Science and Technology

*B.SC. in Computer Science and Engineering*

CGPA: 3.79 (5th Position, Total: 152 Students)

**Award:** Dean's List of Honor

Charlottesville, VA

*Anticipated Completion: May 2026*

Dhaka, Bangladesh

*May 2015 – July 2019*

## WORK EXPERIENCE

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### University of Virginia

*The Biocomplexity Institute (BII), UVA, Research Assistant*

Virginia, United States

*March 2022 – Present*

- **Water Intelligence in Agriculture.** This project is in collaboration with **The AI Institute: Agricultural AI for Transforming Workforce and Decision Support (AgAID)**. My role in the AgAID team is working on designing AI and science-guided machine learning frameworks at the human-water-climate nexus; facilitating an information shift from water supply to spatio-temporal availability. These frameworks will help irrigation managers and water districts to make more effective seasonal and long-horizon planning, forecasting, and allocation decisions. The research thrust covers multiple use-cases associated with water allocation decisions at multiple spatial (farm, district, watershed) and temporal (weekly, seasonal, long-term) scales.
- **Nonpharmaceutical Interventions (NPI) Data Collection and Analysis.** I am working with NPI Data collection team who are Collecting county level NPI data. My role is to validate the data and do multiple analysis to understand the pandemic well.

### Univeristy of Virginia

*Teaching Assistant*

Virginia, United States

*August 2022 – Present*

- **Course: CS 4720 - Mobile Application Development**

I have been working as one of the 2 Teaching assistants in the "Mobile Application Development" course of 90 enrolled students. My general responsibility is to help students in 2 small projects on Android, IOS & React Native, 1 final project, and 3 class tests. While doing that, I usually share my brief industry experience with the students, so that they not only implement the required features, but also implement them in an organized and maintainable way. I make sure they follow proper design patterns, and write proper testing code. I also make sure that their code functions in an optimized way by using my competitive programming skills. I believe my students will use the aforementioned skills in real life, and create maintainable and well performed mobile applications that can make thousands of users' lives easier.

### Enosis Solutions

*Software Engineer*

Dhaka, Bangladesh

*August 2020 – August 2021*

- Worked on a Incident Management tool, which tracks different occurrences of an organization using C# and MVC Framework. All code was reviewed, perfected, and pushed to production.
- Designed and developed the full stack implementation of a web platform to train/test Machine Learning models. Other features include labelling (with the option of drawing bounding box), storing data based on labels/projects. Users can store their trained models, also export others models if it's public etc - using React.js, Node.js, Express.js and MongoDB. This platform makes storing, preparing data and training ML models easier for users.

## RESEARCH INTERESTS

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AI, Machine Learning, Deep Learning & its applications, Computer Vision, Data Science

## UNDERGRADUATE RESEARCH

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### Real-time Bangladeshi Sign Language Detection Using Faster R-CNN

This is a real-time system which detects sign from a video and classifies the sign in the video. It is device and background independent. For the purpose of our work, we developed a robust dataset from scratch - BdSLImSet - which is available for further research. Our system is trained on Faster R-CNN and detects the sign with great accuracy.

### Bangladeshi Sign Word Recognition using LSTM

This is a system which detects sign words -sequence of actions- from a video. This works with sequential data and falls under the domain of action recognition. For the purpose of our work, we developed a robust dataset from scratch - BdSLVidSet - which is available for further research. This dataset is trained using CNN for feature extraction and LSTM to combine the sequential feature to recognize the words.

## PUBLICATIONS

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- **Oishee Bintey Hoque**, Md. Imrul Jubair, Al-Farabi Akash, Md. Saiful Islam, “**BdSL36: A Dataset for Bangladeshi Sign Letters Recognition**”, MLCSA Workshop, Proceedings of the Asian Conference on Computer Vision (ACCV), 2020
- **Oishee Bintey Hoque**, Maisha Binte Rashid, K.M. Tawsik Zawad, “**Autonomous Deblurring Images and Information Extraction from Documents Using CycleGAN and Mask RCNN**”, Accepted in 23rd International Conference on Computer and Information Technology, Dhaka, Bangladesh (ICCIT 2020)
- Sifat Ahmed, Tonmoy Hossain, **Oishee Bintey Hoque**, Sujan Sarker, Sejuti Rahman, Faisal Muhammad Shah, “**Automated COVID-19 Detection from Chest X-Ray Images : A High Resolution Network (HRNet) Approach**”, Pre-print version published at Research Square.
- **Oishee Bintey Hoque**, Md. Imrul Jubair, Md. Saiful Islam, Al-Farabi Akash, “**Real Time Bangladeshi Sign Language Detection using Faster R-CNN**”, International Conference on Innovation in Engineering and Technology(ICIET), Dhaka, Bangladesh, 2018, doi: 10.1109/CIET.2018.8660780.

## TECHNICAL SKILLS

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**Languages:** Java, Python, C/C++, JavaScript, HTML/CSS, R, Matlab, WebGL

**Database:** SQL (MySQL, Oracle, Postgres), MongoDB

**Frameworks:** React, Node.js, Material-UI

**Developer Tools:** Git, VS Code, Visual Studio, PyCharm, Netbeans, Codeblocks

**Libraries:** Pandas, NumPy, Matplotlib, Tensorflow, Pytorch, FastAi

## ACADEMIC PROJECTS

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- War of Spaceship
- Sup - Desktop based server-client chat application with file sharing option
- Shop Expert - E-commerce based website
- Robo Mos Face Recognizing Messenger
- Super-shop Management System
- Puzzle Game with A\* Algorithm
- Personality-Analysis-Using-Variou-Feature-Scaling-On-Dataset
- Efficient Noise Reduction System With Dataset

## PERSONAL PROJECTS

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- 37 Dogs Breed Classifier
- Face Recognition System Using Facenet (1:k matching problem)
- Sentiment Analysis from Facial Expression
- Neural Style Transfer
- Hand Segmentation (wearing gloves)
- Human Segmentation and Background Remove
- IMDB User Review Analysis

## AWARDS & ACHIEVEMENTS

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- “Dean’s List of Honor” in undergrad based on result
- 11th Position, National Girls Programming Contest-2016
- 16th Position, National Girls Programming Contest-2017
- 64th Position, ACM ICPC DHAKA Regional 2017
- 99th Position, ACM ICPC DHAKA Regional 2018
- 5th Position, Intra AUST Programming Contest CONTEST-Spring 2016
- Judge at Bangladeshi National Robotics Olympiad, 2019
- Judge at Bangladeshi National Robotics Olympiad, 2020
- Certificate on Presentation at International Conference on Innovation in Engineering and Technology(ICIET - 2018)
- Certificate on Presentation at 23rd International Conference on Computer and Information Technology, Dhaka, Bangladesh (ICCIT 2020)
- Certificate on Presentation at 15th Asian Conference on Computer Vision (ACCV), 2020
- Certificate on passing Japanese NAT - N4 Test
- Member of Core Organizing Panel, “AUST CSE WEEK - 2018”

## ONLINE COURSES

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- Deep Learning for Coders – Fastai
- Deep Learning Specialization by Andrew Ng – Coursera
- TensorFlow in Practice Specialization – Coursera
- TensorFlow: Data and Deployment Specialization - Coursera

## REFERENCES

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### **Dr. Madhav Marathe**

Professor, Computer Science

Distinguished Professor in Biocomplexity, Biocomplexity Institute

Division Director, Network Systems Science and Advanced Computing Division, Biocomplexity Institute

University of Virginia

### **Samarth Swarup**

Research Associate Professor Biocomplexity Institute

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### **Mohammad Imrul Jubair**

Assistant Professor, Dept. of CSE

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