OISHEE BINTEY HOQUE

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EDUCATION

PhD in Computer Science, *University of Virginia* **|** *Charlottesville, VA* *August 2021 - July 2026(Expected)*

- Specialization: Knowledge-Guided Machine Learning, Multimodal Understanding, VLMs, Remote Sensing

MS in Computer Science, *University of Virginia* **|** *Charlottesville, VA* *May 2025*

- Relevant Courses: Machine Learning (ML), ML in Image Processing, Interpretable ML, Design and Analysis of Algorithms, NLP, Mobile and Iot Security, Software Security via Program Analysis, 3D Computer Vision

BSc in Computer Science, *Ahsanullah University of Science and Technology | Dhaka, Bangladesh* *Aug* 2019

- Graduated with Dean's List of Honor

EXPERIENCE

Graduate Research Assistant, *University of Virginia* *Aug 2021 – Present*

Tech Stack: Python, Tensorflow, Pandas, Rasterio, NumPy, Matplotlib, scikit-learn, OpenCV, QGIS, Jupyter Notebooks, Pytorch

- Built **IRRISIGHT** , a 1.4M-sample multimodal dataset integrating satellite imagery, soil/crop metadata, and textual prompts; achieved +3.8% Dice over RGB-only baselines.
- Created **CAFOSat**: 45K+ high-resolution annotated patches with infrastructure-level labels for livestock facility detection.
- Developed **IGraSS** framework combining segmentation with graph-theoretic constraints, reducing unreachable canal segments from 18% ⟶ 3%.
- Designed **KIIM** Swin Transformer–based knowledge guided irrigation mapping model using bidirectional cross-attention and crop-type priors; boosted IoU for rare drip irrigation by +71.4%.
- Released **IrrMap** dataset (1.1M patches, 14M acres) with full ML pipeline for irrigation mapping research.

Graduate Teaching Assistant, *University of Virginia* *Aug 2021 – Jan 2025*

- Teaching Assistant for undergraduate Mobile Application Development (Fall'22) and Machine Learning (Spring'23), Neural Networks (Spring'25)

Research Intern, *USDA-NIFA/NSF AI Institute for Next Generation Food Systems (AIFS)* *Jun 2023 – August 2023*

Tech Stack: Python, Tensorflow, Pandas, Rasterio, NumPy, Matplotlib, scikit-learn, OpenCV, QGIS, Jupyter Notebooks, Pytorch

- Processed and integrated multi-source geospatial data for segmentation models.
- Implemented IrrNet incremental patch-size training, improving accuracy by ~10% over SOTA.
- Experimented with multi-channel Landsat imagery to identify optimal configurations for irrigation classification.

Software Engineer*, Enosis Solutions***,** *Dhaka, Bangladesh* *Aug 2020 – Jul 2021*

Tech Stack: C#, JS, SQL (MySQL, Oracle), MongoDB, React.js, Node.js, Express.js, MVC Framework, Git, Visual Studio, Jira

- Worked closely with teams of 6-8 on an 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.
- Collaborated effectively with members of the software development team and personnel in other departments.

SELECTED RESEARCH PUBLICATIONS

[1] ***Oishee Bintey Hoque***; **et al.**, "CAFOSat: A Strongly Annotated Dataset for Infrastructure-Aware CAFO Mapping Using High-Resolution Imagery", Under Review at NeurIPS 2025

[2] **Oishee Bintey Hoque**; **et al.**, "IRRISIGHT: A Large-Scale Multimodal Dataset and Scalable Pipeline to Address Irrigation and Water Management in Agriculture", Under Review at NeurIPS 2025

[3] ***Oishee Bintey Hoque; et al., "****Knowledge-Informed Deep Learning for Irrigation Type Mapping from Remote Sensing****",*** *Accepted at* ***IJCAI 2025***

[4] ***Oishee Bintey Hoque; et al., "****IrrMap: A Large-Scale Comprehensive Dataset for Irrigation Method Mapping****",*** *Accepted at* ***KDD 2025***

[5] ***Oishee Bintey Hoque; et al., "****IGraSS: Learning to Identify Infrastructure Networks from Satellite Imagery by Iterative Graph-constrained Semantic Segmentation****", Accepted at* ***IJCAI 2025***

[6] ***Oishee Bintey Hoque; et al***., **"**IrrNet: Advancing Irrigation Mapping with Incremental Patch Size Training on Remote Sensing Imagery", **V4A, CVPR, 2024**

[7] ***Oishee Bintey Hoque; et al***., "COVID-19 non-pharmaceutical interventions: data annotation for rapidly changing local policy information", **Scientific Data - Nature**, **2023**

[8] Sifat Ahmed, Tonmoy Hossain, ***Oishee Bintey Hoque***, ***et al***., "Automated COVID-19 Detection from Chest X-Ray Images: A High-Resolution Network (HRNet) Approach", SN Computer Science. 2021

[9] ***Oishee Bintey Hoque***; ***et al***., "BdSL36: A Dataset for Bangladeshi Sign Letters Recognition", **ACCV Workshops, 2020**

[10] ***Oishee Bintey Hoque***, ***et al***., "Real Time Bangladeshi Sign Language Detection using Faster R-CNN", **ICIET, 2018**

EXTRA CURRICULAR ACTIVITIES

- **Mentored two undergraduate summer 2025 interns** on computer vision and remote sensing projects, guiding experimental design and model development.
- Achieved **3rd Position** in **2023 AgAID Digital AgAth0n**
- Served as Space and Media Chair, Computer Science Graduate Student Group (CSGSG) Council – 2022.
- Achieved 11th Position, National Girls Programming Contest-2016, Bangladesh. (Tech Stack: C/C++, CodeBlocks)
- Social Chair, Computer Science Graduate Student Group (CSGSG) Council – 2024