

Badhan Das

Assistant Professor, BRAC University

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Profiles

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Education

- 2025 **Ph.D. in Computer Science**, *Virginia Polytechnic Institute and State University*, Blacksburg VA, USA.
- 2024 **MS in Computer Science**, *Virginia Polytechnic Institute and State University*, Blacksburg, VA, USA.
- 2017 **B.Sc. in Computer Science**, *Bangladesh University of Engineering and Technology*, Dhaka, Bangladesh.

Research Interests

Computational Biology and Bioinformatics, Algorithms, Graph Theory, ML in Graphs, ML in Genomics, Digital Logic Design

Professional Experience

- Summer 2026 **Department of Computer Science and Engineering**, *Assistant Professor*, BRAC University.
Automata and Computability
Data Science–Coding With Real-World Data
- Spring 2026 **Department of Biology**, *Postdoctoral Associate*, New York University.
Center for Genomics and Systems Biology
- Summer 2025 **Department of Computer Science**, *Adjunct Faculty*, Virginia Tech.
Software Design and Data Structures
- Summer 2024 **Department of Computer Science**, *Adjunct Faculty*, Virginia Tech.
Introduction to Software Design

Fall 2017 - **Department of Computer Science and Engineering, Lecturer.**

Fall 2020 Southeast University, Dhaka, Bangladesh

Courses Instructed:

Digital Logic Design, Digital Logic Design Lab, Data Structure, Data Structure Lab, Theory of Computing, Computer Architecture, Discrete Mathematics, Algorithm, Algorithm Lab, Numerical Methods, Graphics and Animation, Graphics and Animation Lab, Microprocessor Design and Assembly Language Programming Lab, Statistics and Probability

Students advised (undergrad thesis): 4

Journal Publications

- [1] Badhan Das and Lenwood S Heath. "ViraFit: Tunable Fitness Model for Viral Evolution Within a Contact Network". In: *Journal of Computational Biology* (May 2026), p. 15578666261444396. URL: <https://journals.sagepub.com/doi/abs/10.1177/15578666261444396>.
- [2] Badhan Das and Lenwood S. Heath. "Variant evolution graph: Can we infer how SARS-CoV-2 variants are evolving?" In: *PLOS ONE* 20.6 (June 2025), pp. 1–26. DOI: 10.1371/journal.pone.0323970. URL: <https://doi.org/10.1371/journal.pone.0323970>.
- [3] Badhan Das, Muhit Islam Emon, Nazifa Ahmed Moumi, Justin Sein, Amy Pruden, Lenwood S Heath, and Liqing Zhang. "HT-ARGfinder: A Comprehensive Pipeline for Identifying Horizontally Transferred Antibiotic Resistance Genes and Directionality in Metagenomic Sequencing Data". In: *Frontiers in Environmental Science* 10 (2022), pp. 901–917. DOI: <https://doi.org/10.3389/fenvs.2022.901917>.
- [4] Nazifa Ahmed Moumi, Badhan Das, Zarin Tasnim Promi, Nishat Anjum Bristy, and Md. Shamsuzzoha Bayzid. "Quartet-based inference of cell differentiation trees from ChIP-Seq histone modification data". In: *PLOS ONE* 14.9 (Sept. 2019), pp. 1–25. DOI: 10.1371/journal.pone.0221270. URL: <https://doi.org/10.1371/journal.pone.0221270>.

Conference Publications

- [1] Muhit Islam Emon, Badhan Das, Ashrith Reddy Thukkaraju, and Liqing Zhang. "DeePSP-GIN: identification and classification of phage structural proteins using predicted protein structure, pretrained protein language model, and graph isomorphism network". In: *Proceedings of the 15th ACM International Conference on Bioinformatics, Computational Biology and Health Informatics*. BCB '24. Shenzhen, China: Association for Computing Machinery, 2024. ISBN: 9798400713026. DOI: 10.1145/3698587.3701371. URL: <https://doi.org/10.1145/3698587.3701371>.
- [2] Rajon Bardhan, Maksuda Rabeya, Mou Mahmood, Badhan Das, and Hanif Bhuiyan. "An Area-efficient 2-to-4 Decoder Design Based on Quantum Dot Cellular Automata". In: *2021 International Conference on Science & Contemporary Technologies (ICSCT)*. IEEE. 2021, pp. 1–5. DOI: 10.1109/ICSCT53883.2021.9642494.
- [3] Badhan Das, Mou Mahmood, Maksuda Rabeya, and Rajon Bardhan. "An Effective Design of 2 : 1 Multiplexer and 1 : 2 Demultiplexer using 3-dot QCA Architecture". In: *2019 International Conference on Robotics, Electrical and Signal Processing Techniques (ICREST)*. Jan. 2019, pp. 570–575. DOI: 10.1109/ICREST.2019.8644353.
- [4] Maksuda Rabeya, Mou Mahmood, Badhan Das, Rajon Bardhan, and Md. Hasan Tareque. "An Efficient Design of 4 - to - 2 Encoder and Priority Encoder Based on 3-dot QCA Architecture". In: *2019 International Conference on Electrical, Computer and Communication Engineering (ECCE)*. Feb. 2019, pp. 1–6. DOI: 10.1109/ECACE.2019.8679471.

Manuscript Under Review

Mutation Learning Graph: A Mutation-Space Graph Construction Framework for Viral Genomes, *Badhan Das and Lenwood S. Heath*.

Research Projects

- Spring 2026 **Genome-scale mapping and functional characterization of cis-regulatory networks in cellular reprogramming and regeneration.**
- Spring 2025 - **Unraveling the origin of vegetative desiccation tolerance in vascular plants.**
Fall 2025
- Summer 2023 **Global Pervasive Computational Epidemiology project.**
- Fall 2024
- Summer 2022 **genomeRxiv: A Microbial Whole-genome Database and Diagnostic Marker Design Resource for Classification, Identification, and Data Sharing.**
- Summer 2021 **Developing CyberInfrastructure for Waterborne Antibiotic Resistance Risk Surveillance (CI4-WARS).**
- Spring 2022

Undergraduate Thesis Supervision

- Summer 2026 **A deep-learning framework integrating H&E and multi-omics for improved prognosis and immunotherapy response in non-small cell lung cancer**, *Dia Nur Shehba, Farhan Zarif, Sajid Hossain Pranto*.

Reviewer

Journal of Engineering