

Akidul Haque

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Objective:

I am a mathematics graduate passionate about applying mathematical principles to real-world challenges. I specialize in computational methods and theoretical frameworks and eager to enhance my expertise in analytical problem-solving and quantitative reasoning in mathematics and statistics.

Education:

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| Aug, 2023 – ongoing |  Dual Degree program: PhD in Applied Mathematics and Masters in Biostatistics, University of Louisville, KY, USA. |
| 2023 – 2024 |  Masters of Science (M.S) in Applied Mathematics, University of Louisville, KY, USA. |
| 2020 – 2021 |  Masters of Science (M.S.)(Thesis based) in Mathematics, University of Dhaka, Bangladesh.
<i>Thesis title: Harvesting Strategies and Environmental Fluctuations on Holling-types Predator-prey Models.</i> |
| 2016 – 2019 |  Bachelor of Science (B.S.) Honours in Mathematics, University of Dhaka, Bangladesh.
<i>Honours Project: Numerical Studies of Two-Point Boundary Value Problem.</i> |

Peer-Reviewed, Indexed Publications :

1. Pritam Saha, **Akidul Haque**, Md. Shahidul Islam, and Uttam Ghosh (2025). "Dynamic complexities of a modified Leslie–Gower model in deterministic and stochastic environments". Modeling Earth Systems and Environment. DOI : [10.1007/s40808-024-02179-w](https://doi.org/10.1007/s40808-024-02179-w).
Funded by: University Grants Commission (UGC), India. UGC Ref. No.:1222/(CSIR-UGC NET JUNE 2019)
2. **Akidul Haque**, Pritam Saha, Shubhadeep Ghosh, Shahidul Islam, and Uttam Ghosh, "Effects of environment fluctuation and allee on predator of a Braazykin type population model."(Submitted)
3. **Akidul Haque**, Esrat-Nur Md. Anuar Hossen, and Shahidul Islam, "Dynamical Behavior Analysis of anti-control Lorenz System."(Submitted)
4. **Akidul Haque**, and Rafiqul Islam, "Mathematical modeling and analysis of Dengue and Chikungunya Co-infection."(Submitted)
5. Rafiqul Islam, and **Akidul Haque**, " Predicting Dengue Cases in Bangladesh Using Meteorological Factors: A Poisson Regression Approach." (Submitted)

Peer-Reviewed, Non-Indexed Publications :

1. Md Rakibul Hasan, Laura Mclessey, **Akidul Haque**, Moryom Akter Muna, and Zeeshan Ul Haq, "A Multilevel Perspective on PrEP Adherence in HIV Prevention: An Integrative Review Guided by the Socioecological Model.", British Journal of Nursing Studies, October 2025, DOI : 10.32996/bjns.2025.5.3.2.
2. Md Rakibul Hasan, **Akidul Haque**, Fahad Bin Halim, Zeeshan Ul Haq, Moryom Akter Muna, and Tayyeb Ayyoubi (2025), "Alcohol-Related Disruptions in PrEP Continuity and Associated HIV and STI Vulnerabilities: An Umbrella Review.", European Journal of Health Sciences, 11(2), 61–95. DOI: 10.47672/ejhs.280561

Publication in preparations :

1. Dan Han, **Akidul Haque**, "Spatiotemporal Dynamic Lag Models for Nowcasting COVID-19 Rates Using Waste Water Data."
2. Dan Han, **Akidul Haque**, "Relationship between the wastewater virus level and underreported positive COVID-19 cases."
3. **Akidul Haque**, Dan Han, "Hierarchical Bayesian Elastic Net Methods on Exponential Random Graph Models."
4. **Akidul Haque**, Md. Anuar Hossen, Md. Shahidul Islam, and Uttam Ghosh, " Mathematical Analysis to Control Invasive Species in Competition with Native Species."
5. **Akidul Haque**, and Rafiqul Islam, "Two-strain Influenza Modeling in the United States"

Conference Proceedings :

1. Akidul Haque, Dan Han, "Spatiotemporal Dynamic Lag Models for Nowcasting COVID-19 Rates Using Waste Water Data", Joint Mathematics Meetings, 2026, Washington D.C. Presenting Author: **Akidul Haque**
2. Dr.Md.Shahidul Islam, Akidul Haque, Pritam Saha, and Uttam Ghosh, "Dynamic complexities of a modified Leslie–Gower model in response to the Holling IV function", International Conference on Non-linear Analysis and Optimization (ICAN- OPT. NEPAL 2025). Presenting Author: **Dr.Md.Shahidul Islam**
3. Akidul Haque, Dr. Md.Shahidul Islam, "Harvesting Strategies and Environmental Fluctuations on Holling-types Predator-prey Models", A F Mujibur Rahman-Bangladesh Mathematical Society National Mathematics Conference-2022. Presenting Author: **Akidul Haque**

Research Interest:

My research focuses on the mathematical and statistical modeling frameworks—including non-linear dynamical systems, stochastic processes, and Bayesian inference—to investigate complex biological, ecological, and epidemiological phenomena such as co-infection dynamics, invasive species control, microbial-host interactions, and chaotic system behavior. With a strong interdisciplinary focus, my research aims to generate actionable insights for public health surveillance (e.g., wastewater-based COVID-19 nowcasting), biodiversity conservation, and engineering applications such as secure communication systems, by integrating theory-driven analysis with real-world data in both deterministic and stochastic environments.

Awards:

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| 2025 |  Sir Cyril Taylor Memorial Scholarship. |
| 2023-ongoing |  Graduate Teaching Assistantships of University of Louisville, KY, USA. |

Awards: (continued)

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| 2021-2022 | ■ National Science and Technology Fellowships, Bangladesh for Master's Thesis research. |
| 2021 | ■ Honours merit-based Scholarship of the University of Dhaka. |

Extra-Curricular Activities:

1. General Member at Graduate Student Council of University of Louisville.
2. General Member of Dhaka University Model United Nations.
3. Volunteer at a non-profitable social organization named "Light of Hopes Youth Foundation."
4. Program Co-ordinator and founding member of Mathematics Photography club, University of Dhaka.
5. Member of "Badhon"(A student-based Blood Donations Group).