

# Kamrun Nahar Keya

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## SUMMARY

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Excel in mathematical modeling and am highly adept at creating and utilizing advanced mathematical models, such as differential equations, discrete equations, and algorithms, to analyze and validate experimental data.

## EDUCATION

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### Doctor of Philosophy

Arizona State University

**Expected August 2027**

**Tempe, AZ, USA**

- Major in Applied Mathematics
- Am directing a project of Malignant Multiforme tumor model.
- Executed a project on numerical approach to predict behavior of Glioblastoma Multiforme tumor.
- Experienced a group project on estimating SARS-CoV-2 viral counts in Arizona wastewater.

### Master of Arts

Arizona State University

**August 2024**

**Tempe, AZ, USA**

- Major in Applied Mathematics
- Directed research on data-induced modeling of tribolium confusum population.

### Master of Science

University of Dhaka

**March 2019**

**Dhaka, Bangladesh**

- Major in Mathematics
- Conducted research of population dynamics, focused on reaction-diffusion modeling in ecology.

### Bachelor of Science

University of Dhaka

**August 2017**

**Dhaka, Bangladesh**

- Major in Mathematics.

## TECHNICAL SKILLS

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- Programming Languages: MATLAB | FORTRAN | Mathematica | Python
- Technical: Microsoft Office suite (Word, PowerPoint, and Excel), Latex

## EXPERIENCE

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### Graduate Research Fellow

Arizona State University

**June 2023 - August 2023**

**Tempe, AZ, USA**

- Designed a discrete-time, data-driven model for Tribolium confusum populations.
- Developed MATLAB programming to optimized parameter for each set of data.
- Conveyed complex ideas to diverse audiences, resulting in a presentation at a mathematical conference.
- Executed technical and analytical problem-solving tasks.
- Excelled both as an individual and as part of a team of 10, following through a report with minimal supervision.
- Managed multiple projects simultaneously to accommodate different areas of research.

### Graduate Teaching Associate

Arizona State University

**August 2022 - Present**

**Tempe, AZ, USA**

- Guide graduate students with class work and assist with assignments in graduate level courses; Grade graduate courses: PDE and Applied Analysis and MATLAB courses for undergrad; Helped undergrad student in assignments in MATLAB lab.

- Maintain Proctoring center by taking make up exams, organizing exam materials; Mentored undergraduate research group of 4 students; Tutor students in math community center.

### **Graduate Teaching Assistant**

Texas Tech University

**September 2021 - July 2022**

**Lubbock, TX, USA**

- Conducted summer research on epidemiology: SI and SIR Model with Trait.
- Graded calculus courses for 120 students; Tutored in tutoring center; Proctored undergrad finals

### **Lecturer**

Military Institute of Science and Technology

**September 2019 - July 2021**

**Dhaka, Bangladesh**

- Taught concepts of differential and integral Calculus to class of 90 students and elaborated on applications of calculus in engineering; Prepared exam materials and proctored all students during exams;
- Taught concepts of Probability and Statistics to class of 50 students and, Laplace Transformation to class of 27 students, Numerical Analysis to class of 27 students, Complex Variable to class of 60 students.
- Prepared new and revised syllabus for 2 courses: Calculus and Laplace Transform, added concepts of calculus application broadly deploy in engineering.
- Mentored 10 undergrad students for Mathematics Olympiad; Organized workshop for new undergrad to smooth transition from high school to University.

### **Research Assistant**

University of Dhaka

**July 2018 - July 2019**

**Dhaka, Bangladesh**

- Designed, managed and analyzed 3 research project of population dynamics and conducted numerical simulations of each results using FORTRAN and MATLAB.
- Reviewed 2 research article for journal submission; assisted lab members conducting research and simulations.

## **SKILLS**

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- Mathematical Modeling
- Numerical Simulation
- Quantitative analysis
- Data visualization
- Parameter estimation
- Pattern recognition

## **LEADERSHIP EXPERIENCE**

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### **President**

Association of Women in Mathematics, Student chapter.

**April 2024 - Present**

**Tempe, AZ, USA**

- Am leading the AWM student Chapter and managing its activities in accordance with the policies and procedures of the AWM.

### **Treasurer**

Association of Women in Mathematics, Student chapter.

**August 2023 - April 2024**

**Tempe, AZ, USA**

- Kept accurate and adequate records of assets and transactions using Excel.
- Prepared the Chapter's Annual Financial Report using Excel.
- Served closely with the President, the School of Mathematical and Statistical Sciences, and the Graduate and Professional Student Association (GPSA).
- Secured sponsorships and funding of about \$1000 from the School of Mathematical and Statistical Sciences (SoMSS) to support financial aspects of the AWM chapter meetings.

## **REU Mentor**

Arizona State University

**July 2023 - August 2023**

**Tempe, AZ, USA**

- Provided research guidance and MATLAB support to a diverse group of 4 undergraduate research students.
- Enhanced leadership and communication skills by mentoring 4 diverse group of students.
- Facilitated group meetings to address academic, personal, and career-related concerns

## **PROFESSIONAL & CAMPUS INVOLVEMENT**

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- Serving as Travel Grant Reviewer of the Graduate and Professional Student Association of ASU to review and mark down travel grant proposals from graduate students at ASU.
- Volunteered ASU open door in 2023 and 2024 at Tempe campus to assist non-major people finding interest in mathematics; showcasing star individuals from mathematics.
- Volunteered ASU homecoming block part 2023 at Tempe Campus by showcasing mathematics department and its involvement.

## **PUBLICATIONS**

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- Kamrujjaman, M., Keya, K. N., ... & Mohebujjaman, M. (2023). Spatio-temporal solutions of a diffusive directed dynamics model with harvesting, *Journal of Applied Mathematics and Computing*, Springer, DOI: doi.org/10.1007/s12190-022-01742-x
- Kamrujjaman, M., Zahan, I, Keya K. N., & Hassan, M. N. (2022). Interplay of resource mappings and evolutionary diffusion: Competitive exclusion and coexistence analysis, *Partial Differential Equations in Applied Mathematics*, Elsevier, Vol. 5, DOI: 10.1016/j.padiff.2022.100398
- Keya K. N., Kamrujjaman, M., and Islam, M. S. (2021). The Influence of Density in Population Dynamics with Strong and Weak Allee Effect, *Journal of the Egyptian Mathematical Society*, Springer, Vol. 29(4), DOI: doi.org/10.1186/s42787-021-00114-x
- Kamrujjaman, M., Keya K. N., and Islam, M. S. (2020). Lyapunov Stability Analysis of a Competition Model with Crowding Effects, *GANIT J. Bangladesh Math. Soc.*, Vol. 40(2), p 95--110
- Kamrujjaman, M., and Keya K. N. (2018). Global Analysis of a Directed Dynamics Competition Model, *Journal of Advances in Mathematics and Computer Science*, Vol. 27(2), p 1--14, 10.9734/JAMCS/2018/41247

## **AWARDS & HONORS**

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- Recipient of 2023 Student Leader award.
- Recipient of 2021 Bangladesh-Sweden Trust fund.
- Recipient of 2021 Research Excellency award from Military Institute of Science and Technology, Bangladesh.
- Recipient of 2018 Best Presenter award from National Mathematics Conference, Bangladesh.
- Recipient of 2017 Best Poster award from National Mathematics Conference held, Bangladesh.
- Recipient of 2017 Merit Scholarship from University of Dhaka, Bangladesh.