# Ahmedur Rahman Shovon

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| **Education** | **PhD in Computer Science** | **2025** |
| | University of Illinois Chicago | Chicago, IL |

Dissertation: **Declarative Analytics on Heterogeneous HPC Systems**
Advisor: Dr. Sidharth Kumar
GPA: 4.00/4.00

**MS in Information Technology**                                    **2018**
Jahangirnagar University                                    Dhaka, Bangladesh
Thesis: A RESTful E-Governance Application Framework for People Identity Verification in Cloud
Advisor: Dr. Md Whaiduzzaman
GPA: 3.67/4.00

**BS in Information Technology**                                    **2016**
Jahangirnagar University                                    Dhaka, Bangladesh
Project: EasyC: A Platform for Learning C Programming
Advisor: Dr. Risala Tasin Khan
GPA: 3.73/4.00

**Research Interest**

High Performance Computing, Data Analytics, Cloud Computing, Software Engineering

**Experience**

**Postdoctoral Appointee**                                    **08/2025 - cont**
Argonne National Lab                                    Lemont, IL
- Designing system software and runtime support for energy-efficient HPC platforms.
- Implementing deployment and monitoring tools for scientific data streaming workflows.
- Evaluating performance and energy efficiency on novel architectures and accelerators.

**Graduate Research and Teaching Assistant**                                    **08/2023 - 08/2025**
University of Illinois Chicago                                    Chicago, IL
- Developed the first multi-node, multi-GPU Datalog engine for heterogeneous systems.
- Designed topological clustering pipelines for high-dimensional brain connectivity data.
- Performed GPU portability and power analysis of GPU-accelerated Datalog engines.

**Graduate Student Intern (WJ Cody Associate)**                                    **05/2023 - 08/2023**
Argonne National Lab                                    Lemont, IL
- Enhanced Rosetta-Bench, a benchmark suite for evaluating parallel programming model performance.
- Integrated HIP benchmarks and refined benchmark report generation.
- Collaborated with HPC engineers on integrating the benchmark suite in HPC systems.

**Graduate Research Assistant (Blazer Fellow)**                                    **08/2021 - 08/2023**
University of Alabama at Birmingham                                    Birmingham, AL
- Built a GPU-accelerated relational algebra backend for Datalog-like applications.
- Developed a visualization tool to create Kaplan Meier survival probability graph for cancer data analysis.
- Designed a topological data analysis pipeline using persistent homology on rs-fMRI brain networks.

**Assistant Programmer**                                    **06/2019 - 08/2021**
ICT Division, Government of Bangladesh                                    Dhaka, Bangladesh
- Developed a web application visualizing e-File usage data across root-level government offices.
- Led cross-functional teams in developing and delivering multiple e-Governance applications.
- Integrated technology-driven solutions to advance Sustainable Development Goals (SDG).

**Software Engineer**     12/2017 - 06/2019
Cefalo Bangladesh Ltd.     Dhaka, Bangladesh
- Developed and maintained five publications of this Norwegian media conglomerate in a global team.
- Re-designed the digital subscription model that reduced the subscription completion time by 75%.
- Automated multi-tiered web application deployment process by designing a CI/CD pipeline.

**Software Engineer**     10/2016 - 11/2017
Codalo     Dhaka, Bangladesh
- Developed a Education as a Service(EaaS) application.
- Created real time fingerprint based attendance system with instant messaging service.
- Designed a CI/CD pipeline for web application deployment.

**Teaching Experience**

**Graduate Teaching Assistant**     Spring 2025
Department of Computer Science, University of Illinois Chicago     Chicago, IL
Course: *Introduction to High-Performance Computing*
- Evaluated assignments, projects, and theoretical tasks related to parallel computing and HPC concepts.
- Created scripts using Github APIs for grading and organizing students assignment on Github classroom.
- Assisted students on their projects on ALCF and campus HPC resources.

**Graduate Teaching Assistant**     Fall 2024
Department of Computer Science, University of Illinois Chicago     Chicago, IL
Course: *Database Systems*
- Designed and evaluated SQL programming assignments, projects, and exams.
- Configured Gradescope's Autograder for autograding programming assignments.
- Delivered a guest lecture on optimizing database performance by caching queries using Redis.

**Graduate Teaching Assistant**     01/2016 - 12/2016
Institute of Information Technology, Jahangirnagar University     Dhaka, Bangladesh
Course: *Operating Systems*
- Conducted weekly lab sessions focused on shell scripting, process management, and system calls.
- Assisted students in implementing OS-related projects, debugging code, and understanding core concepts.
- Designed and graded bi-weekly tests on operating system topics.

**Bibliometrics**

Journal Articles: 3, Book Chapter: 1, Conference Papers: 8, Workshop Papers: 2
Citations: 2034, h-index: 7 (retrieved from Google Scholar on September 9, 2025)

**Journal Articles**

[J3] Sidharth Kumar, **Ahmedur Rahman Shovon**, Gopikrishna Deshpande, **The robustness of persistent homology of brain networks to data acquisition-related non-neural variability in resting state fMRI**, In: *Human Brain Mapping*. DOI: 10.1002/hbm.26403. (Q1).

[J2] Darshan Shimoga Chandrashekar, Santhosh Kumar Karthikeyan, Praveen Kumar Korla, Henalben Patel, **Ahmedur Rahman Shovon**, Mohammad Athar, George J Netto, Zhaohui S Qin, Sidharth Kumar, Upender Manne, Chad J Crieghton, and Sooryanarayana Varambally, **UALCAN: An update to the integrated cancer data analysis platform**, In: *Neoplasia*. DOI: 10.1016/j.neo.2022.01.001. (Q1).

[J1] Md Whaiduzzaman, Md. Razon Hossain, **Ahmedur Rahman Shovon**, Shanto Roy, Aron Laszka, Rajkumar Buyya, and Alistair Barros, **A Privacy-preserving Mobile and Fog Computing Framework to Trace and Prevent COVID-19 Community Transmission**, In: *IEEE Journal of Biomedical and Health Informatics (J-BHI)*. DOI: 10.1109/JBHI.2020.3026060. (Q1).

**Book Chapters**

[B1] **Ahmedur Rahman Shovon**, Shanto Roy, Tanusree Sharma, and Md. Whaiduzzaman, **A RESTful E-Governance Application Framework for People Identity Verification in Cloud**, In: *Luo M., Zhang LJ. (eds) Cloud Computing – CLOUD 2018. Lecture Notes in Computer Science, vol 10967. Springer, Cham.* DOI: 10.1007/978-3-319-94295-7_19.

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| **Conference Papers** | **[C8] Ahmedur Rahman Shovon**, Yihao Sun, Thomas Gilray, Kristopher Micinski, Sidharth Kumar, **Multi-Node Multi-GPU Datalog**, In: *ACM International Conference on Supercomputing 2025 (ICS 2025)*, DOI: 10.1145/3721145.3730431. |

**[C7]** Yihao Sun, **Ahmedur Rahman Shovon**, Thomas Gilray, Kristopher Micinski, Sidharth Kumar, **Optimizing Datalog for the GPU**, In: *2025 the ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS 2025)*, DOI: 10.1145/3669940.3707274.

**[C6]** Andres Sewell, Ke Fan, **Ahmedur Rahman Shovon**, Landon Dyken, Sidharth Kumar, Steve Petruzza, **Bruck Algorithm Performance Analysis for Multi-GPU All-to-All Communication**, In: *Proceedings of the International Conference on High Performance Computing in Asia-Pacific Region (HPCAsia 2024)*, Nagoya, Japan, 2024 pp. 127–133. DOI: 10.1145/3635035.3635047.

**[C5] Ahmedur Rahman Shovon**, Thomas Gilray, Kristopher Micinski, Sidharth Kumar, **Towards Iterative Relational Algebra on the GPU**, In: *2023 USENIX Annual Technical Conference (USENIX ATC 23)*, Boston, MA, USA, 2023 pp. 1009-1016. ISBN: 978-1-939133-35-9.

**[C4]** Md Whaiduzzaman, Alistair Barros, **Ahmedur Rahman Shovon**, Md Razon Hossain, and Colin Fidge, **A Resilient Fog-IoT Framework for Seamless Microservice Execution**, In: *IEEE International Conference on Services Computing (SCC) - 2021*, pp. 213-221. DOI: 10.1109/SCC53864.2021.00034.

**[C3]** Md Shahriare Satu, Md Khalilur Rahman, Maksud Alam Rony, **Ahmedur Rahman Shovon**, Md Jane Alam Adnan, Koushik Chandra Howlader, and M Shamim Kaiser, **COVID-19: Update, Forecast and Assistant-An Interactive Web Portal to Provide Real-Time Information and Forecast COVID-19 Cases in Bangladesh**, In: *International Conference on Information and Communication Technology for Sustainable Development - 2021*, pp. 456-460. DOI: 10.1109/ICICT4SD50815.2021.9396786.

**[C2] Ahmedur Rahman Shovon**, Shanto Roy, Arnab Kumar Shil, and Tanjila Atik, **GDPR Compliance: Implementation Use Cases for User Data Privacy in News Media Industry**, In: *International Conference on Advances in Science, Engineering and Robotics Technology (ICASERT) - 2019*, pp. 1-6. DOI: 10.1109/ICASERT.2019.8934660.

**[C1]** Shanto Roy, **Ahmedur Rahman Shovon**, and Md. Whaiduzzaman, **Combined approach of Tokenization and Mining to secure and optimize Big Data in Cloud Storage**, In: *IEEE R10 Humanitarian Technology Conference (R10-HTC) - 2017*, pp. 83-88. DOI: 10.1109/R10-HTC.2017.8288912.

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| **Workshop Papers** | **[W2]** Kashyap Balakavi, Rushitha Janga, **Ahmedur Rahman Shovon**, Don Dempsey, Elliot Lefkowitz, and Sidarth Kumar, **Scalable, interactive and hierarchical visualization of virus taxonomic data**, In: *2021 IEEE Workshop on Visual Analytics in Healthcare (VAHC)*, Melbourne, Australia, 2023, in conjunction with IEEE VIS 2023, DOI: 10.1109/VAHC60858.2023.00012. |

**[W1] Ahmedur Rahman Shovon**, Landon Richard Dyken, Oded Green, Thomas Gilray, and Sidharth Kumar, **Accelerating Datalog applications with cuDF**, In: *2022 IEEE/ACM Workshop on Irregular Applications: Architectures and Algorithms (IA3)*, Dallas, TX, USA, 2022 pp. 41-45 in conjunction with SC22. DOI: 10.1109/IA356718.2022.00012.

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| **Reviewer Recognition** | **Journal: Sustainable Cities and Society (SCS)**<br>Impact Factor: 7.58, Publisher: *Elsevier*. |

**ACM/IEEE Supercomputing Conference (SC)**
Reviewed submissions for SC23 and SC25.

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| **Awards** | **USENIX ATC Student Grant**      2023<br>Awarded by the USENIX Association. |

**Blazer Graduate Research Fellowship**      2021-2022
Awarded by the University of Alabama at Birmingham.

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| | **National Science and Technology (NST) Fellowship** | 2016-2017 |
| | Awarded by the Ministry of Science and Technology, Bangladesh. | |
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| | **University Merit Scholarships** | 2012-2016 |
| | Awarded by the Jahangirnagar University. | |
| **Achievements** | **3rd @ Computational Research Symposium Poster Presentation 2025** | 04/2025 |
| | Presented posted on our multi-node multi-GPU Datalog engine (MNMGDatalog). | |
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| | **Winner @ oneAPI Hackathon: CUDA to SYCL Migration** | 10/2023 |
| | Ported CUDA project to SYCL with automatic and manual interventions. | |
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| | **1$^{st}$ @ Hackerrank Python and Security domain** | 07/2016 |
| | Solved all Python and Security domain related challenges at Hackerrank. | |
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| | **7$^{th}$ @ IEEEXtreme Programming Competition 9.0** | 10/2015 |
| | Achieved 7$^{th}$ position out of 2,477 teams, Team: *JUIITCoders*. | |
| **Technical Skills** | **Languages**: Python, C++, JavaScript, Java, SQL, Bash, PHP. | |
| | **Parallel programming models**: CUDA, MPI, Thrust, SYCL, HIP, OpenMP, CuDF. | |
| | **Data analytics**: Pandas, NumPy, Scikit-learn, Gudhi, Matplotlib, D3.js. | |
| | **Web tools**: Flask, Django, React, jQuery, CodeIgniter, Redis, AWS. | |
| | **CI/CD**: Docker, GitHub Actions, Travis CI, Jenkins, Boto3, Kubernetes. | |
| **Training** | **Hands-on HPC Workshop @ ALCF** | 10/2023 |
| | Covers topics to porting applications to heterogeneous architectures. | |
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| | **AI for Science on Supercomputers @ ALCF** | 12/2022 |
| | Covers topics to develop AI solutions and scale AI training on ThetaGPU supercomputer. *(certificate link)* | |
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| | **Hands-On HPC @ OLCF** | 12/2022 |
| | Covers HPC tools (MPI, OpenMP, and CUDA) using Summit supercomputer. *(certificate link)* | |
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| | **Fundamentals of Accelerated Computing @ NVIDIA** | 06/2022 |
| | Covers topics of accelerating applications on GPUs utilizing CUDA programming model. *(certificate link)* | |
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| | **Effective Object Oriented Programming @ Cefalo** | 05/2018 |
| | Covers core principles of Object Oriented Programming. Achievement: *Certificate of Excellence* | |
| **Community Contributions** | **Top 3% contributor @ StackOverflow** | Username: *arshovon* |
| | Gained 13600+ reputation in *StackOverflow*. | |
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| | **Contribution @ PyPI** | Username: *arsho* |
| | Developed *Powerlog*, *Bangla*, *AutoLike*, *Opener*, and *CopyUSB* PyPI listed packages. | |
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| | **Judge @ UIC Undergraduate Research Forum 2024** | 04/2024 |
| | Served as a judge under Office of Undergraduate Research and External Fellowships. | |
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| | **Judge @ Research Expo, UAB** | 08/2021 - 08/2023 |
| | Served as a judge under Service Learning and Undergraduate Research, UAB. | |
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| | **Volunteer @ The World Games 2022, Birmingham, USA** | 07/2022 |
| | Served as a volunteer for the International World Games Association (IWGA). | |
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| | **Webmaster @ IEEE Student Branch, JU** | 05/2015 - 10/2016 |
| | Developed and maintained IEEE SB, JU website. | |