

# Ahmedur Rahman Shovon

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## Education

**PhD in Computer Science** **08/2025**  
University of Illinois Chicago  
Dissertation: **Declarative Analytics on Heterogeneous HPC Systems**  
Advisor: Dr. Sidharth Kumar  
GPA: 4.00/4.00  
**Chicago, IL**

**MS in Information Technology** **11/2018**  
Jahangirnagar University  
Thesis: A RESTful E-Governance Application Framework for People Identity Verification in Cloud  
Advisor: Dr. Md Whaiduzzaman  
GPA: 3.67/4.00  
**Dhaka, Bangladesh**

**BS in Information Technology** **04/2016**  
Jahangirnagar University  
Project: EasyC: A Platform for Learning C Programming  
Advisor: Dr. Risala Tasin Khan  
GPA: 3.73/4.00  
**Dhaka, Bangladesh**

## 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 16, 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 L.J. (eds) Cloud Computing – CLOUD 2018. Lecture Notes in Computer Science, vol 10967. Springer, Cham*. DOI: 10.1007/978-3-319-94295-7\_19.

Conference Papers	[C8] <b>Ahmedur Rahman Shovon</b> , Yihao Sun, Thomas Gilray, Kristopher Micinski, Sidharth Kumar, <b>Multi-Node Multi-GPU Datalog</b> , In: <i>ACM International Conference on Supercomputing 2025 (ICS 2025)</i> , DOI: 10.1145/3721145.3730431.	
	[C7] Yihao Sun, <b>Ahmedur Rahman Shovon</b> , Thomas Gilray, Kristopher Micinski, Sidharth Kumar, <b>Optimizing Datalog for the GPU</b> , In: <i>2025 the ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS 2025)</i> , DOI: 10.1145/3669940.3707274.	
	[C6] Andres Sewell, Ke Fan, <b>Ahmedur Rahman Shovon</b> , Landon Dyken, Sidharth Kumar, Steve Petruzza, <b>Bruck Algorithm Performance Analysis for Multi-GPU All-to-All Communication</b> , In: <i>Proceedings of the International Conference on High Performance Computing in Asia-Pacific Region (HPCAsia 2024)</i> , Nagoya, Japan, 2024 pp. 127–133. DOI: 10.1145/3635035.3635047.	
	[C5] <b>Ahmedur Rahman Shovon</b> , Thomas Gilray, Kristopher Micinski, Sidharth Kumar, <b>Towards Iterative Relational Algebra on the GPU</b> , In: <i>2023 USENIX Annual Technical Conference (USENIX ATC 23)</i> , Boston, MA, USA, 2023 pp. 1009-1016. ISBN: 978-1-939133-35-9.	
	[C4] Md Whaiduzzaman, Alistair Barros, <b>Ahmedur Rahman Shovon</b> , Md Razon Hossain, and Colin Fidge, <b>A Resilient Fog-IoT Framework for Seamless Microservice Execution</b> , In: <i>IEEE International Conference on Services Computing (SCC) - 2021</i> , pp. 213-221. DOI: 10.1109/SCC53864.2021.00034.	
	[C3] Md Shahriare Satu, Md Khalilur Rahman, Maksud Alam Rony, <b>Ahmedur Rahman Shovon</b> , Md Jane Alam Adnan, Koushik Chandra Howlader, and M Shamim Kaiser, <b>COVID-19: Update, Forecast and Assistant-An Interactive Web Portal to Provide Real-Time Information and Forecast COVID-19 Cases in Bangladesh</b> , In: <i>International Conference on Information and Communication Technology for Sustainable Development - 2021</i> , pp. 456-460. DOI: 10.1109/ICICT4SD50815.2021.9396786.	
Workshop Papers	[C2] <b>Ahmedur Rahman Shovon</b> , Shanto Roy, Arnab Kumar Shil, and Tanjila Atik, <b>GDPR Compliance: Implementation Use Cases for User Data Privacy in News Media Industry</b> , In: <i>International Conference on Advances in Science, Engineering and Robotics Technology (ICASERT) - 2019</i> , pp. 1-6. DOI: 10.1109/ICASERT.2019.8934660.	
	[C1] Shanto Roy, <b>Ahmedur Rahman Shovon</b> , and Md. Whaiduzzaman, <b>Combined approach of Tokenization and Mining to secure and optimize Big Data in Cloud Storage</b> , In: <i>IEEE R10 Humanitarian Technology Conference (R10-HTC) - 2017</i> , pp. 83-88. DOI: 10.1109/R10-HTC.2017.8288912.	
	[W2] Kashyap Balakavi, Rushitha Janga, <b>Ahmedur Rahman Shovon</b> , Don Dempsey, Elliot Lefkowitz, and Sidarth Kumar, <b>Scalable, interactive and hierarchical visualization of virus taxonomic data</b> , In: <i>2021 IEEE Workshop on Visual Analytics in Healthcare (VAHC)</i> , Melbourne, Australia, 2023, in conjunction with IEEE VIS 2023, DOI: 10.1109/VAHC60858.2023.00012.	
Awards	[W1] <b>Ahmedur Rahman Shovon</b> , Landon Richard Dyken, Oded Green, Thomas Gilray, and Sidharth Kumar, <b>Accelerating Datalog applications with cuDF</b> , In: <i>2022 IEEE/ACM Workshop on Irregular Applications: Architectures and Algorithms (IA3)</i> , Dallas, TX, USA, 2022 pp. 41-45 in conjunction with SC22. DOI: 10.1109/IA356718.2022.00012.	
	<b>USENIX ATC Student Grant</b>	2023
	Awarded by the USENIX Association.	
	<b>Blazer Graduate Research Fellowship</b>	2021-2022
	Awarded by the University of Alabama at Birmingham.	
	<b>National Science and Technology (NST) Fellowship</b>	2016-2017
	Awarded by the Ministry of Science and Technology, Bangladesh.	
	<b>University Merit Scholarships</b>	2012-2016
	Awarded by the Jahangirnagar University.	

<b>Achievements</b>	<b>3rd @ Computational Research Symposium Poster Presentation 2025</b> Presented posted on our multi-node multi-GPU Datalog engine (MNMGDatalog).	04/2025
	<b>Winner @ oneAPI Hackathon: CUDA to SYCL Migration</b> Ported CUDA project to SYCL with automatic and manual interventions.	10/2023
	<b>1<sup>st</sup> @ Hackerrank Python and Security domain</b> Solved all Python and Security domain related challenges at Hackerrank.	07/2016
	<b>7<sup>th</sup> @ IEEEExtreme Programming Competition 9.0</b> Achieved 7 <sup>th</sup> position out of 2,477 teams, Team: <i>JUIITCoders</i> .	10/2015
<b>Technical Skills</b>	<b>Languages:</b> Python, C++, JavaScript, Java, SQL, Bash, PHP. <b>Parallel programming models:</b> CUDA, MPI, Thrust, SYCL, HIP, OpenMP, CuDF. <b>Data analytics:</b> Pandas, NumPy, Scikit-learn, Gudhi, Matplotlib, D3.js. <b>Web tools:</b> Flask, Django, React, jQuery, CodeIgniter, Redis, AWS. <b>CI/CD:</b> Docker, GitHub Actions, Travis CI, Jenkins, Boto3, Kubernetes.	
<b>Reviewer Recognition</b>	<b>Sustainable Cities and Society (SCS) Journal</b> Impact Factor: 7.58, Publisher: <i>Elsevier</i> .	
	<b>IEEE Access Journal</b> Impact Factor: 3.6, Publisher: <i>IEEE</i> .	
	<b>ACM/IEEE Supercomputing Conference (SC)</b> Reviewed submissions for SC23 and SC25.	
<b>Community Contributions</b>	<b>Top 3% contributor @ StackOverflow</b> Gained 13600+ reputation in <i>StackOverflow</i> .	Username: <i>arshovon</i>
	<b>Contribution @ PyPI</b> Developed <i>Powerlog</i> , <i>Bangla</i> , <i>AutoLike</i> , <i>Opener</i> , and <i>CopyUSB</i> PyPI listed packages.	Username: <i>arsho</i>
	<b>Judge @ UIC Undergraduate Research Forum 2024</b> Served as a judge under Office of Undergraduate Research and External Fellowships.	04/2024
	<b>Judge @ Research Expo, UAB</b> Served as a judge under Service Learning and Undergraduate Research, UAB.	08/2021 - 08/2023
	<b>Volunteer @ The World Games 2022, Birmingham, USA</b> Served as a volunteer for the International World Games Association (IWGA).	07/2022
	<b>Webmaster @ IEEE Student Branch, JU</b> Developed and maintained IEEE SB, JU website.	05/2015 - 10/2016