

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: 4, Book Chapter: 1, Conference Papers: 8, Workshop Papers: 2
 Citations: 2108, h-index: 8 (retrieved from Google Scholar on October 12, 2025)

Journal Articles

[J4] **Ahmedur Rahman Shovon**, Sidharth Kumar, Gopikrishna Deshpande, **Topology Assisted Clustering of Temporal fMRI Brain Networks With Use-Case in Mitigating Non-Neural Multi-Site Variability**, In: *IEEE Access*. DOI: 10.1109/ACCESS.2025.3616256. (Q1).

[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	<p>[B1] Ahmedur Rahman Shovon, Shanto Roy, Tanusree Sharma, and Md. Whaiduzzaman, A RESTful E-Governance Application Framework for People Identity Verification in Cloud, In: <i>Luo M., Zhang L.J. (eds) Cloud Computing – CLOUD 2018. Lecture Notes in Computer Science, vol 10967. Springer, Cham.</i> DOI: 10.1007/978-3-319-94295-7_19.</p>								
Conference Papers	<p>[C8] Ahmedur Rahman Shovon, Yihao Sun, Thomas Gilray, Kristopher Micinski, Sidharth Kumar, Multi-Node Multi-GPU Datalog, In: <i>ACM International Conference on Supercomputing 2025 (ICS 2025)</i>, DOI: 10.1145/3721145.3730431.</p> <p>[C7] Yihao Sun, Ahmedur Rahman Shovon, Thomas Gilray, Kristopher Micinski, Sidharth Kumar, Optimizing Datalog for the GPU, In: <i>2025 the ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS 2025)</i>, DOI: 10.1145/3669940.3707274.</p> <p>[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: <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.</p> <p>[C5] Ahmedur Rahman Shovon, Thomas Gilray, Kristopher Micinski, Sidharth Kumar, Towards Iterative Relational Algebra on the GPU, In: <i>2023 USENIX Annual Technical Conference (USENIX ATC 23)</i>, Boston, MA, USA, 2023 pp. 1009-1016. ISBN: 978-1-939133-35-9.</p> <p>[C4] Md Whaiduzzaman, Alistair Barros, Ahmedur Rahman Shovon, Md Razon Hossain, and Colin Fidge, A Resilient Fog-IoT Framework for Seamless Microservice Execution, In: <i>IEEE International Conference on Services Computing (SCC) - 2021</i>, pp. 213-221. DOI: 10.1109/SCC53864.2021.00034.</p> <p>[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: <i>International Conference on Information and Communication Technology for Sustainable Development - 2021</i>, pp. 456-460. DOI: 10.1109/ICICT4SD50815.2021.9396786.</p> <p>[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: <i>International Conference on Advances in Science, Engineering and Robotics Technology (ICASERT) - 2019</i>, pp. 1-6. DOI: 10.1109/ICASERT.2019.8934660.</p> <p>[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: <i>IEEE R10 Humanitarian Technology Conference (R10-HTC) - 2017</i>, pp. 83-88. DOI: 10.1109/R10-HTC.2017.8288912.</p>								
Workshop Papers	<p>[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: <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.</p> <p>[W1] Ahmedur Rahman Shovon, Landon Richard Dyken, Oded Green, Thomas Gilray, and Sidharth Kumar, Accelerating Datalog applications with cuDF, 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.</p>								
Awards	<table border="0" style="width: 100%;"> <tr> <td style="width: 80%;">USENIX ATC Student Grant</td> <td style="text-align: right;">2023</td> </tr> <tr> <td colspan="2">Awarded by the USENIX Association.</td> </tr> <tr> <td>Blazer Graduate Research Fellowship</td> <td style="text-align: right;">2021-2022</td> </tr> <tr> <td colspan="2">Awarded by the University of Alabama at Birmingham.</td> </tr> </table>	USENIX ATC Student Grant	2023	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 Awarded by the Ministry of Science and Technology, Bangladesh.	2016-2017
	University Merit Scholarships Awarded by the Jahangirnagar University.	2012-2016
Achievements	3rd @ Computational Research Symposium Poster Presentation 2025 Presented posted on our multi-node multi-GPU Datalog engine (MNMGDatalog).	04/2025
	Winner @ oneAPI Hackathon: CUDA to SYCL Migration Ported CUDA project to SYCL with automatic and manual interventions.	10/2023
	1st @ Hackerrank Python and Security domain Solved all Python and Security domain related challenges at Hackerrank.	07/2016
	7th @ IEEEExtreme Programming Competition 9.0 Achieved 7 th position out of 2,477 teams, Team: <i>JUITCodereers</i> .	10/2015
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.	
Reviewer Recognition	Sustainable Cities and Society (SCS) Journal Impact Factor: 7.58, Publisher: <i>Elsevier</i> .	
	IEEE Access Journal Impact Factor: 3.6, Publisher: <i>IEEE</i> .	
	ACM/IEEE Supercomputing Conference (SC) Reviewed submissions for SC23 and SC25.	
Community Contributions	Top 3% contributor @ StackOverflow Gained 13600+ reputation in <i>StackOverflow</i> .	Username: <i>arshovon</i>
	Contribution @ PyPI Developed <i>Powerlog</i> , <i>Bangla</i> , <i>AutoLike</i> , <i>Opener</i> , and <i>CopyUSB</i> PyPI listed packages.	Username: <i>arsho</i>
	Judge @ UIC Undergraduate Research Forum 2024 Served as a judge under Office of Undergraduate Research and External Fellowships.	04/2024
	Judge @ Research Expo, UAB Served as a judge under Service Learning and Undergraduate Research, UAB.	08/2021 - 08/2023
	Volunteer @ The World Games 2022, Birmingham, USA Served as a volunteer for the International World Games Association (IWGA).	07/2022
	Webmaster @ IEEE Student Branch, JU Developed and maintained IEEE SB, JU website.	05/2015 - 10/2016