

AHMEDUR RAHMAN SHOYON

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Education

PhD Candidate (Expected graduation: Summer 2025) **2023-cont.**
Department of Computer Science, University of Illinois Chicago Chicago, IL
Advisor: Dr. Sidharth Kumar
GPA: 4.00

PhD Student - Blazer Graduate Research Fellow **2021-2023**
Department of Computer Science, University of Alabama at Birmingham AL
Advisor: Dr. Sidharth Kumar
GPA: 4.00

Master of Science in Information Technology **2016-2017**
Institute of Information Technology, Jahangirnagar University Dhaka, Bangladesh
Advisor: Dr. Md Whaiduzzaman
GPA: 3.67
Thesis: An Optimized RESTful E-Governance Application Framework for People Identity Verification in Cloud

Bachelor of Science in Information Technology **2012-2016**
Institute of Information Technology, Jahangirnagar University Dhaka, Bangladesh
Advisor: Dr. Risala Tasin Khan
GPA: 3.73
Project: EasyC: A platform for learning C programming

Research Interest

High Performance Computing, Data Analytics, Cloud Computing

Experience

Graduate Research Assistant **08/2023 - cont.**
University of Illinois Chicago Chicago, IL

- Developing GPU applications focusing on high-performance relational algebra primitives [C7].
- Extending the topological data analysis pipeline to apply persistent homology on temporal brain networks.
- Designing multi-node multi-GPU applications to solve iterative high-performance relational algebra tasks.

Graduate Student Intern (WJ Cody Associate) **05/2023 - 08/2023**
Argonne National Lab Lemont, IL

- Extended Rosetta-Bench, a benchmark suite and framework for heterogeneous computing focusing on the performance benchmarks of parallel programming models.
- Enhanced suite support by adding HIP programming language benchmarks, refined benchmark report generation, added filters to selectively run subsets of benchmarks, and regular tasks such as bug fixing.

Graduate Research Assistant (Blazer Fellow) **08/2021 - 08/2023**
University of Alabama at Birmingham Birmingham, AL

- Demonstrated the feasibility of a high-performance relational algebra backend for a subset of Datalog applications leveraging GPU parallelism [W1, C5].
- Developed a visualization tool to create Kaplan Meier survival probability graph for cancer data analysis [J2].
- Designed a topological data analysis pipeline to apply persistent homology on brain networks resting state fMRI data [J3].

Assistant Programmer

06/2019 - 08/2021

ICT Division, Government of Bangladesh

Dhaka, Bangladesh

- Designed and implemented e-File application ranking platform.
- Contributed to the development of e-Governance and e-Services solutions.
- Actively served to achieve Smart Cities and Communities to attain 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% using Django REST framework and ReactJS.
- Contributed to building a CI/CD pipeline to automate the application deployment.

Teaching Experience

Graduate Teaching Assistant (CS 480: Database Systems)

Fall 2024

Department of Computer Science, University of Illinois Chicago

Chicago, IL

- Designed and evaluated SQL programming assignments, projects, and theoretical tasks related to database concepts.
- Configured Gradescope's Autograder for autograding programming assignments.
- Delivered a guest lecture on optimizing database performance by caching queries using Redis.

Graduate Teaching Assistant (Operating System Lab)

01/2016 - 12/2016

Jahangirnagar University

Dhaka, Bangladesh

- Led 2-hour weekly lab sessions on shell programming.
- Assisted students with projects and assignments, offering guidance and constructive feedback.
- Designed and evaluated bi-weekly tests on operating system topics.

Bibliometrics

Journal Articles: 3, Book Chapter: 1, Workshop Papers: 2, Conference Papers: 7
Citations: 1367, h-index: 6 (retrieved from Google Scholar on 11/13/2024)

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. Impact Factor: 4.5, Q1 Journal.

[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. Impact Factor: 5.71, Q1 Journal.

- [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. Impact Factor: 5.22, Q1 Journal.
- 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.* https://doi.org/10.1007/978-3-319-94295-7_19.
- 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.
- [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.
- Conference Papers**
- [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)*(Accepted).
- [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 (ICICT4SD) - 2021*, pp. 456-460.
- [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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| Reviewer Recognition | Journal: Sustainable Cities and Society (SCS) <i>Impact Factor: 7.587</i> , Publisher: Elsevier. | |
| Awards | USENIX ATC Student Grant | 2023 |
| | Awarded by the USENIX Association. | |
| | Blazer Graduate Research Fellowship | 2021 |
| | Awarded by the University of Alabama at Birmingham. | |
| | National Science and Technology (NST) Fellowship | 2016-17 |
| Achievements | Awarded by the Ministry of Science and Technology, Bangladesh. | |
| | University Merit Scholarships | 2012-16 |
| | Awarded by the Jahangirnagar University. | |
| | National Merit Scholarship | 2011 |
| | Awarded by the Ministry of Education, Bangladesh. | |
| Training | Winner @ oneAPI Hackathon: CUDA to SYCL Migration | 10/2023 |
| | Ported CUDA project to SYCL with automatic and manual interventions. | |
| | Participant @ Argonne GPU Hackathon 2022 | 07/2022 |
| | Benchmarked transitive closure computation, nested loop join on ThetaGPU. | |
| | 1st @ Hackerrank Python and Security domain | 07/2016 |
| Achievements | Solved all Python and Security domain challenges at Hackerrank. | |
| | 7th @ IEEEExtreme Programming Competition 9.0 | 10/2015 |
| | Achieved 7 th position out of 2,477 teams, Team: <i>JUHTCoders</i> . | |
| | 1st @ Intra University Programming Contest, JU | 08/2015 |
| | Achieved 1 st position in <i>Intra University Programming Contest, JU, 2015</i> . | |
| Training | Hands-on HPC Workshop @ ALCF | 10/2023 |
| | Covers topics to utilize Polaris and AI Testbeds focusing on porting applications to heterogeneous architectures (CPU + GPU) on ALCF systems. | |
| | AI for Science on Supercomputers @ ALCF | 12/2022 |
| | Covers topics to develop and apply AI solutions and scale AI training for science on ThetaGPU (Argonne supercomputer). (<i>certificate link</i>) | |
| Training | Hands-On HPC @ OLCF | 12/2022 |
| | Covers essential tools for High-Performance Computing, including MPI, OpenMP, | |

and GPU programming using Summit supercomputer. (*certificate link*)

Fundamentals of Accelerated Computing @ NVIDIA 06/2022
Covers topics of accelerating CPU-only applications to run their latent parallelism on GPUs utilizing CUDA programming model. (*certificate link*)

Effective Object Oriented Programming @ Cefalo 05/2018
Covers core concepts and principles of Object Oriented Programming. Achievement: Certificate of Excellence (Distinction) (*certificate link*)

Technical Skills

Advanced: Python, JavaScript, Git, LaTeX.
Intermediate: C++, CUDA, MPI, Docker, Bash, SQL.
Basic: NoSQL, Java, SYCL, AWS, PHP, Travis CI.

Community Contributions

Judge @ UIC Undergraduate Research Forum 2024 04/2024
Served as a judge under Office of Undergraduate Research and External Fellowships.

Judge @ Research Expo, UAB 08/2021 - 08/2023
Served as a judge under Service Learning and Undergraduate Research, UAB.

Volunteer @ The World Games 2022, Birmingham, USA 07/2022
Served as a volunteer for the International World Games Association (IWGA).

Webmaster @ IEEE Student Branch, JU 05/2015 - 10/2016
Developed and maintained IEEE SB, JU website.

Top 3% contributor @ Stack Overflow Username: *arshovon*
Gained 13500+ reputation in *StackOverflow* where developers learn and build careers.

Contribution @ PyPI Username: *arsho*
Developed *Bangla*, *AutoLike*, *Opener*, and *CopyUSB* PyPI listed packages.