

Arif ARMAN

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OBJECTIVE

Computer Science and Engineering PhD candidate with a background in Algorithm Optimization, Big Data Systems, and High-Performance Computing, motivated to build skills by working in leading research facilities.

EDUCATION

Texas A&M University, College Station, TX

Doctor of Philosophy in COMPUTER SCIENCE AND ENGINEERING, *Exp: Dec. 2025*

Dissertation: High-performance Skew-resilient SIMD Sorting of Large-scale Datasets

Advisor: Dr. Dmitri Loguinov

Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh

Bachelor of Science in COMPUTER SCIENCE AND ENGINEERING, *Mar. 2016*

CGPA **3.88**/4.00; Ranked 10th in a graduating class of 142 students

Thesis: Continuous Maximum Visibility Query for a Moving Target

Advisor: Dr. Mohammed Eunus Ali

RESEARCH INTERESTS

Algorithm Optimization, Big Data and Database Systems, High-Performance Computing, Data Mining.

EXPERIENCE

Microsoft Research, Azure SQL Data Warehouse

Research Intern, *May - Aug. 2024*

- Developed an efficient SIMD sorter for data stored in columnar format (e.g., Parquet) for operations involving sorting multiple columns.
- Optimized sort performance by utilizing metadata and encodings from the columnar storage.

Google System and Infrastructure, Data Analytics and Storage Performance

Ph.D. Software Engineering Intern, *Jun - Aug. 2021*

- Accelerating analytics: Identified acceleration opportunities in Google's analytics engines such as Dremel and F1. In addition, build an analytical model to perform what-if analysis for different accelerator types.
- Spanner IPC variance root cause: Investigated primary cause of variance in IPC for Google's globally distributed database service.

Texas A&M University, Department of Computer Science and Engineering

Graduate Research Assistant, with Dr. Dmitri Loguinov, *Sep. 2018 - Current*

- Working on a high-performance SIMD sort that focuses on reducing bottlenecks caused by several CPU components and inefficient compiler code generation.
- Working on a streaming framework that provides programmers with seemingly infinite buffers.

Texas A&M University, Department of Computer Science and Engineering

Graduate Teaching Assistant, *Aug. 2020 - Current*

- Conducted labs, held office hours, prepared exams, and occasionally provided lectures.
- Courses: Networks and Distributed Processing (CSCE 612), Operating Systems (CSCE 611), Machine Learning (CSCE 633), Introduction to Computer Systems (hon's) (CSCE 313H), Data Structures and Algorithms (hon's) (CSCE 221H).

Bangladesh University of Engineering and Technology, Dept. of Computer Science and Engineering.
Research Assistant, with Dr. Mohammed Eunus Ali, *May. 2015 - Jul. 2018*

- Started working as undergraduate thesis focus and continued to extend after graduation. Multiple papers have been published in top conference proceedings.
- Developed a variant of R*-Tree to improve performance of novel visibility queries, in collaboration with RMIT University, Australia.

United International University, Department of Computer Science and Engineering
Lecturer, *May. 2016 - Jul. 2018*

- Designed courses, prepared syllabus and exams, conducted lectures, mentored students.
- Courses: Algorithms (CSI 227), Discrete Mathematics (CSI 219), Object Oriented Programming (CSI 221), Structured Programming Language (CSI 121)
- Organized an international conference and inter-university hackathon.

HONORS AND AWARDS

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- **CIKM/SIGIR Travel Grant** to attend and present paper in International Conference on Information and Knowledge Management (CIKM) at Pan Pacific, Singapore. *2017*
 - **Best Poster Award** for Continuous Maximum Visibility Query for a Moving Target in Poster Session of Australasian Database Conference, Sydney, Australia, *2016*
 - **Dean's List Award** and **Several Merit Scholarships** for Outstanding Undergraduate Results, Bangladesh University of Engineering and Technology. *2012-2016*
 - **Best Information System Design** for Automation of City Development Authority, Bangladesh University of Engineering and Technology. *2014*
 - **One of Top Ten Database Projects** for Chain Shop Management System, Bangladesh University of Engineering and Technology. *2014*
 - **Full Free Merit Scholarship** for Higher Secondary Results, Dhaka City College. *2009*

PUBLICATIONS

Peer Reviewed

- **Arif Arman** and Dmitri Loguinov. “Origami: A High-Performance Mergesort Framework” Proceedings of the **VLDB** Endowment Vol. 15 No. 2. 2021.
- Carson Hanel, **Arif Arman**, Di Xiao, John Keech, and Dmitri Loguinov. “Vortex: Extreme-Performance Memory Abstractions for Data-Intensive Streaming Applications”. ACM **ASPLOS** 2020.
- Tamjid Al Rahat, **Arif Arman**, Mohammed Eunus Ali. “Maximizing Reverse k-Nearest Neighbors for Trajectories”. In: Databases Theory and Applications. **ADC**. Lecture Notes in Computer Science, vol 10837 Pages: 262-274. Springer. 2018.
- **Arif Arman**, Mohammed Eunus Ali, Farhana Murtaza Choudhury, and Kaysar Abdullah. “VizQ: A System for Scalable Processing of Visibility Queries in 3D Spatial Databases”. In Proceedings of the 2017 ACM on Conference on Information and Knowledge Management (**CIKM**). 2017.
- **Arif Arman**, Kaysar Abdullah, Ishat E Rabban, and Mohammed Eunus Ali. “IndVizCMap: Visibility Color Map in an Indoor 3D Space”. In Proceedings of the Eighth **ACM SIGSPATIAL** International Workshop on Indoor Spatial Awareness (**ISA**). 2016.
- Ch. Md. Rakin Haider, **Arif Arman**, Mohammed Eunus Ali, and Farhana Murtaza Choudhury. “Continuous Maximum Visibility Query for a Moving Target”. In Proceedings of the 27th Australasian Database Conference, (**ADC**), Sydney, NSW, 82-94. 2016.

Under Review

- **Arif Arman** and Dmitri Loguinov. “F5: A Robust Highly-Optimized In-place MSD Radix-Sort”.

- Zelun Liu, **Arif Arman**, Carson Hanel, and Dmitri Loguinov. “Typhoon: A Slice-Scrambled In-Place LSD Sort for Large-Scale Datasets”.

ADDITIONAL INFORMATION

Invited Talks:

- “Origami: A High-Performance Mergesort Framework”, at Microsoft Research Gray Systems Lab.

Leadership and Participation:

- Vice President and Treasurer, Bangladesh Student Association at Texas A&M University. 2021-2023.
- Organizer and Mentor, UX DESIGN CONTEST, PROJECT SHOWCASING and PROBLEM SETTER at UIU CSE Festival, 2017.
- Organizer, International Conference on Medical Engineering, Health Informatics and Technology, 2016.
- Co-Founder and former General Secretary, Science Club of the Laboratorians.
- Participant, Microsoft Imagine Cup 2013, Top 12 with project Solvencia; a communication platform for supershop and farmers using IVR (Interactive Voice Response).
- Participant, EATL-Prothom Alo App Development Contest 2014 for a first person shooting game.

Advanced Language and Platform Proficiency:

- C/C++, MASM, Python, PL/SQL, Intel VTune Profiler

REFERENCES

Dr. Dmitri Loguinov
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