Arif ARMAN

⚲ Room #211, L.F. Peterson Building, 435 Nagle St, College Station, TX 77843
✉ arman@tamu.edu | ⌂ arif-arman.github.io | 🔗 [arifarman](https://linkedin.com/in/arifarman)

SUMMARY

Ph.D. in Computer Science specializing in **high-performance computing** and **micro-architectural optimization**. Proven expertise in low-latency systems with a strong publication record in **parallel algorithms**, **databases**, and **big-data** workloads. Motivated to contribute to and build skills in leading research facilities.

EDUCATION

Texas A&M University, College Station, TX
Doctor of Philosophy in COMPUTER SCIENCE, *Exp: Summer 2026*
> Dissertation: High-performance SIMD-Accelerated 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, CGPA **3.88**/4.00, *Mar. 2016*
> Thesis: Continuous Maximum Visibility Query for a Moving Target
> Advisor: Dr. Mohammed Eunus Ali

RESEARCH 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.
- Tools/Platforms: C++, SIMD (AVX-512), x86 Assembly, Intel VTune, Parquet

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.
- Investigated root cause of IPC variance for Google's globally distributed database service Spanner.
- Tools/Platforms: C++, x86 Assembly, Dremel, F1, Spanner

Texas A&M University, Department of Computer Science and Engineering
Graduate Research Assistant, with Dr. Dmitri Loguinov, *Sep. 2018 - Current*

- Worked on a *streaming* framework that provides programmers with seemingly infinite buffers and a novel in-place MSD Radix-sort using the framework that is $3-4\times$ faster than SOTA *(Vortex, ASPLOS 2020)*.
- Developed a high-performance parallel SIMD merge-sort framework that maximizes SIMD register usage and reduces branch misprediction penalties, up to $2\times$ over SOTA *(Origami, VLDB 2022)*.
- Developed an efficient key partition engine that resolves slowdowns caused by memory disambiguation, resulting in $2-3\times$ speedup over SOTA *(Typhoon, Bigdata, 2025)*.
- Working on a high-performance SIMD sorter of small chunks that is useful for segmented sorts and dealing with smaller arrays in base cases of several sorts (MSD-radix, Merge, Quick etc.).
- Tools/Platforms: C++, x86 Assembly, SIMD, Intel VTune, AMD μProf

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

- Developed efficient algorithms to process queries on spatial databases: Maximum visibility of a moving target *(ADC 2016)*, reverse *k*-nearest neighbors of trajectories *(ADC 2018)*.
- Developed demonstration tools for various visibility query processing *(SIGSPATIAL 2016, CIKM 2017)*.
- Developed a variant of R*-Tree to improve performance of novel visibility queries, in collaboration with RMIT University, Australia.
- Tools/Platform: C++, OpenGL, Python

PUBLICATIONS

1. **A. Arman** and D. Loguinov. "F5: A Robust SIMD-Accelerated In-place MSD Radix-Sort". Under revision at **ICDE** 2026.
2. Z. Liu, **A. Arman**, and D. Loguinov. "Typhoon: A Slice-Scrambled In-Place LSD Sort". IEEE **Bigdata**, 2025 (18.7%). ***Best Paper Nominee.***
3. **A. Arman** and D. Loguinov. "Origami: A High-Performance Mergesort Framework" Proceedings of the **VLDB** Endowment Vol. 15 No. 2, 2022 (18.0%).
4. C. Hanel, **A. Arman**, D. Xiao, J. Keech, and D. Loguinov. "Vortex: Extreme-Performance Memory Abstractions for Data-Intensive Streaming Applications". ACM **ASPLOS**, 2020 (18.0%).
5. T. A. Rahat, **A. Arman**, M. E. Ali. "Maximizing Reverse k-Nearest Neighbors for Trajectories". 29th Australasian Database Conference (**ADC**), 2018.
6. **A. Arman**, M. E. Ali, F. M. Choudhury, and K. Abdullah. "VizQ: A System for Scalable Processing of Visibility Queries in 3D Spatial Databases". ACM **CIKM**, 2017.
7. **A. Arman**, K. Abdullah, I. E. Rabban, and M. E. Ali. "IndVizCMap: Visibility Color Map in an Indoor 3D Space". International Workshop on Indoor Spatial Awareness at ACM **SIGSPATIAL**, 2016.
8. C. M. R. Haider, **A. Arman**, M. E. Ali, and F. M. Choudhury. "Continuous Maximum Visibility Query for a Moving Target". 27th Australasian Database Conference (**ADC**), 2016. ***Best Poster Award.***

TEACHING AND MENTORSHIP EXPERIENCE

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).

Texas A&M University, Department of Computer Science and Engineering
Research Mentor, Co-supervised with Dr. Dmitri Loguinov

1. Aiden Carr, "Stable SIMD Sorting Network", *(2024-Current)*
2. Daniel Yeung, "Efficient Parallel SIMD Mergesort", *(2025-Current)*
3. Zelun Liu, "Slice-Scrambled In-Place LSD Sort", *(2023-2025)* → Currently Ph.D. Student at Texas A&M.
4. Rushil Udani, "Parallel Non-Counting In-Place Radix Sort", *2023-2024*.
5. Nick Robert, "High-Performance External-Memory Mergesort", *2022-2023*.

United International University (UIU), 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.

Talks

1. **Microsoft Research**. Efficient SIMD Sorting in Columnar Databases. *Jul. 2024.* [**Internship Talk**].
2. **Microsoft Research**. Origami: A High-Performance Mergesort Framework. *Jul. 2022.* [**Invited Talk**].
3. **VLDB**. Origami: A High-Performance Mergesort Framework. *Jul. 2022.*
4. **Google**. Opportunities for Accelerating Analytics Workloads. *Aug. 2021.* [**Internship Talk**].
5. **CIKM**. VizQ: A System for Scalable Processing of Visibility Queries in 3D Spatial Databases. *Nov. 2017.*
6. **SIGSPATIAL**: IndVizCMap: Visibility Color Map in an Indoor 3D Space. *Nov. 2016.*

Honors and Awards

1. **Bangladesh Sweden Trust Fund Scholarship**, *2019.*
2. **CIKM/SIGIR Travel Grant** to attend and present paper in CIKM at Singapore, *2017.*
3. **Best Poster Award** for Continuous Maximum Visibility Query for a Moving Target in Poster Session of Australassian Database Conference, Sydney, Australia, *2016.*
4. **Dean's List Award** and **Merit Scholarships** for Outstanding Undergraduate Results, BUET, *2012-2016.*
5. **Best Information System Design** for Automation of City Development Authority, BUET, *2014.*
6. **Top 10 Database Projects** for Chain Shop Management System, BUET, *2014.*

Additional Information

Advanced Language and Platform Proficiency:

- C/C++, x86 Assembly, SIMD (SSE, AVX, AVX-512), Profiling (Intel VTune, AMD μProf), Python, Git

U.S. Employment Eligibility:

- U.S. Permanent Resident (no employment visa sponsorship required), Citizen of Bangladesh.

Leadership and Services:

1. **Vice President and Treasurer**, Bangladesh Student Association at Texas A&M University, *2021-2023.*
2. **Organizer and Mentor**, UX Design Contest and Project Showcasing at UIU CSE Festival, *2017.*
3. **Organizer**, International Conference on Medical Engineering, Health Informatics and Technology, *2016.*
4. **Co-Founder and General Secretary**, Science Club at Government Laboratory High School.

References

Available Upon Request.