

Md Ashfaqur Rahaman

Research Interests

Kernel bypass, disaggregated memory, network interconnects, hardware offloading and systems for machine learning

Publications

Network-accelerated Active Messages

Md Ashfaqur Rahaman, Alireza Sanaee, Todd Thornley, Sebastiano Miano, Gianni Antichi, Brent E Stephens, and Ryan Stutsman.
arXiv, 2025. <https://arxiv.org/pdf/2509.07431.pdf>

Stop Taking the Scenic Route: the Shortest Distance Between the CPU and the NIC is MMIO

Wei Siew Liew, Md Ashfaqur Rahaman, James McMahon, Ryan Stutsman, and Vijay Nagarajan.
HotOS, 2025. <https://dl.acm.org/doi/pdf/10.1145/3713082.3730389>

Experience

Research

- 2021-Present **Graduate Research Assistant**, *Utah Scalable Computer Systems Lab*, University of Utah, Utah
- A new efficient, secure, and scalable framework for remote memory access and function offloading exploiting the programmability and offloading capability of smartNICs.
 - Exploring new Host-NIC interface designs and building systems to enable high-bandwidth and low-latency data movement in modern data center networks.
 - SmartNIC offloaded distributed key-value stores.
- Skills:** eBPF, RDMA, DPDK, SmartNICs, PCIe

- Summer 2024 **Research Intern**, *Hewlett Packard Labs*, Milpitas, California
- Optimizing the communication infrastructure to support low-latency high-throughput LLM inference
- Skills:** CUDA, PyTorch, NVLink

- 2019-2021 **Research Assistant**, *Prof. Baris Kasikci's Lab*, University of Michigan, Ann Arbor
- Mentor: Tanvir Ahmed Khan*
- Load-time code layout optimization of large application binaries in warehouse scale computers
- Skills:** LLVM, x86 Assembly, Linux

- 2018-2019 **Research Assistant**, *Climate Modeling and Simulation Lab*, IWFM, BUET
- Advisor: A.K.M. Saiful Islam*
- I worked as a system developer in real-time Flash Flood Early Warning System (FFEWS) project

Professional

- 2018-2019 **Software Engineer**, *NextGen DigiTech*, Dhaka
- I worked on NextGen Tower, a desktop application for designing wind turbines. I contributed in the core software architecture and developed the GUI.
- 2017-2018 **Firmware Engineer**, *2RA Technology Limited*, Dhaka
- I worked on various embedded systems projects based on Raspberry Pi and AVR Microcontrollers.

Education

- Aug. 2021-Present **Ph.D. in Computer Science**, *University of Utah*, Salt Lake City, Utah, USA
- Advisor: Ryan Stutsman*

- 2012-2019 **B.Sc. in Naval Architecture and Marine Engineering**, *Bangladesh University of Engineering and Technology (BUET)*, Dhaka, Bangladesh

Selected Courses

- Fall 2024 Advanced Compilers, University of Utah
- Spring 2024 Advanced Computer Architecture, University of Utah
- Fall 2023 Advanced Networking, University of Utah
- Spring 2022 Software Security, University of Utah
- Fall 2021 Advanced Operating Systems, University Of Utah

Teaching Assistantship

- Fall 2022 Distributed Systems, University Of Utah
- Spring 2022 Operating Systems, University Of Utah

Services

- 2022 Artifact Evaluation Committee Member, OSDI'22
- 2021 Artifact Evaluation Committee Member, SOSP'21

Skills

- Languages C, C++, Rust, Python, CUDA, Go, Assembly(ARM, X86)
- Tools RDMA, CXL, DPDK, eBPF, NVIDIA DOCA, PyTorch
- Platforms NVIDIA BlueField, AVR Microcontrollers, Raspberry Pi, Arduino
- Text Editing Vim, L^AT_EX