

Hasan Al Maruf

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RESEARCH INTERESTS I am interested in **Operating Systems, Distributed Systems, and Resource Disaggregation**, with a focus on application-level performance improvement in the datacenters.

EDUCATION **Ph.D. in Computer Science and Engineering (CSE)** Fall 2017-2022 (expected)
University of Michigan, Ann Arbor, Michigan, USA.

CGPA: 3.7/4.00

Advisor: Prof. Mosharaf Chowdhury

B.Sc. in Computer Science and Engineering (CSE) July 2014

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

CGPA: 3.85/4.00, Ranked 12th in a class of 153 students.

Thesis: Can Hashtags Bear the Testimony of Personality? Predicting Personality from Hashtag.

Advisors: Prof. Mohammed Eunus Ali, Dr. Jalal Mahmud.

RESEARCH EXPERIENCE **September 2017 - Present**

Working on a lightweight and resilient data path for memory disaggregation. Propose a dynamic prefetching algorithm that efficiently identifies memory access pattern to minimize the cache pollution and hide the end-to-end latency. Besides, explore the scope of online erasure coding as a drop-in resilience mechanism in the data path of disaggregated cluster memory.

January 2016 - June 2017

Developed a system for an e-Learning platform that identifies students' cognitive model and then personalizes learning contents and recommends activities for effective learning.

August 2014 - August 2015

Analyzed various aspects of human behavior from social media interactions. Presented the consistency and differences of human behavior in Twitter and Disqus activities.

February 2013 - July 2014

Proposed a generic model of personality prediction based on one's hashtag usage in social media interactions.

WORK EXPERIENCE **Research Assistant, University of Michigan**

September 2017 - Present

Designing software solutions to achieve $O(1)\mu s$ remote memory access latency during memory disaggregation over ultra-fast RDMA networks.

- Explored the existing OS data path for I/O operation and observed its' limitations during memory disaggregation.
- Designed and implemented an efficient prefetch-enabled faster data path during memory diasaggregation inside the Linux Kernel for unmodified memory-intensive applications.
- Implemented an erasure-coded drop-in resilience mechanism for memory disaggregation to handle uncertainties both in the network and the end host with significantly lower overhead.

Senior Software Engineer, Mukto Software Ltd.

September 2016 - June 2017

Software Engineer, Mukto Software Ltd.

July 2014 - August 2016

January 2016 - June 2017 : Developed an AI based *Adaptive Learning Engine* for an e-Learning Platform for computer science and engineering education.

April 2015 - December 2015 : Led a team of three to implement a Survey Data Collection and Analysis system for a business analytics solution titled *Meghdut*.

January 2015 - March 2015 : Developed an aspect-based review mining system to generate Product Performance Report for a business automation solution titled *GSK EAS*.

October 2014 - December 2014 : Implemented *Query Optimisation* techniques for *Papyrus* - a Reporting Engine to provide real time interactive analysis on any data source.

July 2014 - September 2014 : Worked as a *Back-end Developer* for an on demand Warehouse Management System.

Co-founder, Anvil Lab

May 2012 - June 2014

May 2012 - June 2014 : Directed all the processes of Requirements Analysis, System Architecture Design, Development, Testing, Deployment and Maintenance of a large scale enterprise resource planning solution with Sales, Inventory and Supply Chain Management system, titled *Anvil Lab Business Manager*.

August 2013 - November 2013 : Designed and developed an android application titled *News Flash* - an intuitive news reader hub for all local news channels of Bangladesh.

PUBLICATIONS

Hasan Al Maruf and Mosharaf Chowdhury, "LEAP: Prefetch-Enabled Lightweight Data Path for Memory Disaggregation". **In Preparation** for the SOSp'19.

Youngmoon Lee, **Hasan Al Maruf**, Mosharaf Chowdhury, and Kang G. Shin "Drop-In Resilience for Memory Disaggregation". **Under Review** at the SIGCOMM'19.

Hasan Al Maruf, Nagib Meshkat, Mohammed Eunus Ali, and Jalal Mahmud. "Human behaviour in different social medias: A case study of Twitter and Disqus". In Proc. of the ASONAM'15, pp. 270-273.

Hasan Al Maruf, Jalal Mahmud, and Mohammed Eunus Ali. "Can Hashtags Bear the Testimony of Personality? Predicting Personality from Hashtag Use". In Proc. of the SocialCom'14.

**SELECTED
ACADEMIC
PROJECTS**

Memory access trace analysis of unmodified data-intensive applications using PIN tool.

NachOS Extension - Implemented Multiprogramming, Priority Scheduling, Console Management, Page Replacement Algorithm with Java in NachOS framework.

4-Bit Microprocessor - designed with Proteus, simulated in Quartus.

Graph Algorithm Simulator - developed in C++.

Real-Time Streaming within Local Network - developed in Java.

SKILLS

Language: C/C++, Python, Shell script, Javascript, 80x86 Assembly, SQL.

Database and Caching: Cassandra, ElasticSearch, Redis, MSSQL, MySQL.

Tools: PIN tool, Spark, Kafka, NLTK, Stanford CoreNLP, ExpressJs, SailsJs, jQuery.

OS: Good knowledge and experience in Linux Kernel programming.

**AWARDS AND
HONOURS**

BUET **Merit** Scholarship, **Dean's List** award for academic excellence (2009-2014)

Undergraduate Thesis Poster Presentation award, 2014 in CSE Department, BUET.

1st place, BUET Intra-Department System Analysis, Design and Development Contest, 2012 in ASP .Net track.

8th place, Inter-University Programming Contest of Bangladesh, 2011.

9th place, Inter-University Programming Contest of Bangladesh, 2010.

12th place, ACM-ICPC Asia Regional 2010, Dhaka Site.

**OTHER
ACTIVITIES**

Faculty/Staff Mentor, University of Michigan Mentorship Program, Fall 2018

Academic Support Coordinator, National High School Programming Contest, 2015.

Microsoft Student Partner, Bangladesh (August 2013 - July 2014).

Founding Member, BUET Systems Analysis, Design and Development Organisation (BSADD).

Organising Committee Member, BUET CSE festival, 2013.