Ahmad Hossein Yazdani

Computer Science PhD Candidate at Virginia Tech

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Research interests

I'm keen on doing research on a variety of aspects in computer systems , especially in I/O in distributed systems, cloud computing and High Performance Computing. In particular, my research interests have recently been shifted towards **Systems for ML**, as well as employing **ML models to optimize Systems**. Besides, I would like to conduct research on some hot areas like **Adapting distributed applications to an environment containing persistent memories**, **GPU scheduling of distributed applications**, in addition to **Software Hardware co-design** to optimize serverless computing environments

Education

2020–present **PhD, Computer Science**, *Virginia Polytechnic Institute and State University (Virginia Tech)*, Blacksburg, VA, US.
Advisor: Dr Ali Butt, **GPA:** 3.92

2020–May 2025 **Masters of Computer Science**, *Virginia Polytechnic Institute and State University (Virginia Tech)*, Blacksburg, VA, US.
Advisor: Dr Ali Butt, **GPA:** 3.92

2015–2020 : **Bachelor of Computer Software Engineering**, *University of Tehran*, Tehran, Iran.
GPA: 3.2

Conference & Workshop publications

[ICDCN'25] Ahmad Hossein Yazdani, Arnab K. Paul, Ahmad Maroof Karimi, Feiyi Wang, and Ali Butt. User-based i/o profiling for leadership scale hpc workloads. In *Proceedings of the 26th International Conference on Distributed Computing and Networking*, ICDCN '25, page 181–190, New York, NY, USA, Jan. 2025. Association for Computing Machinery. doi:10.1145/3700838.3700865.

[**FAST'23**★] Redwan Ibne Seraj Khan, **Yazdani, Ahmad Hossein**, Yuqi Fu, Arnab K Paul, Bo Ji, Xun Jian, Yue Cheng, and Ali R Butt. Shade: Enable fundamental cacheability for distributed deep learning training. In *Proceedings of the 21th USENIX Conference on File and Storage Technologies*, page 14, Santa Clara, CA, US, Feb. 2023. USENIX Association. URL `https://www.usenix.org/conference/fast23/presentation/khan`.

★ **Top-tier venue**

Research Experience

August,2020 – present ***Research Assistant at Distributed System and Storage Lab*, Virginia Tech**.

Advisor : Dr. Ali Butt, *Professor, Department of Computer Science*, Virginia Tech

- Contributed to Metis project ongoing which is about improving the cachability of the deep learning workloads
- Led a collaborative research with Analytics & AI Methods at Scale Group at Oak Ridge National Laboratory (ORNL) on analytically recognizing the behavior of the users and jobs submitted to HPC systems to improve the I/O efficiency of the HPC systems.

- Leading a collaborative research with Analytics & AI Methods at Scale Group at Oak Ridge National Laboratory (ORNL) and Lawrence Berkeley National Laboratory aiming to address the I/O interference between the training/inference jobs for large AI models in HPC in collaboration with Jean Luca Bez, Ahmad Maroof Karimi, Arnab Kumar Paul, Suren Byna and Feiyi Wang

June,2024 – August,2024 ***Student Assistant at NERSC, Lawrence Berkeley National Laboratory (LBNL), internship***.

Mentors: Stephen Simms, Lisa Gerhardt, Jean Luca Bez

- I investigated the causes of I/O hotspots in HPC applications and analyzed common performance issues. Specifically, I examined Drishti, an HPC I/O recommendation tool, and found it generates many false positive warnings. In future work, I plan to address these inaccuracies, enhance Drishti's ability to provide more reliable I/O optimization recommendations, and improve its capacity to predict job performance based on suggested configurations.

June,2023 – August,2023 ***Student Assistant at Lawrence Berkeley National Laboratory (LBNL), internship***.

Mentors: Suren Byna, Jean Luca Bez

- Continued my research on characterizing the sources of I/O performance variation in HPC, and striving to alleviate the I/O performance variability.
- Presented a poster outlining my findings on the potentials for introducing I/O interference as one cause of variability
- Continuing my efforts to mitigate I/O interference in HPC systems, the work I initiated is ongoing.

June,2021 – August,2021 ***Internship at Oak Ridge National Laboratory, Analytics & AI Methods at Scale Group***.

Mentors: Feiyi Wang, Sarp Oral, Ahmad Maroof Karimi and Arnab Kamur Paul

- First studied the literature on I/O characterization at application level to get insights for building an application and user aware I/O scheduler
- Then collected I/O information of different users and different applications, and showed the user's behaviour affects the I/O performance quite a lot
- Then presented my work at Internship Symposium held for the interns joined the national lab in summer 2021

June,2018 – August,2018 ***Summer Internship at Router lab at University of Tehran***.

- Improved the lab's website in terms of responsiveness and SEO
- Read CISCO's documentations to make the lab router's CLI identical to CISCO
- Also, I was invited to participate in a project for adding QoS to data plane of the lab's routers.

Fellowships & Awards

2024 ***TCPP travel grant recipient for IPDPS24***, San Francisco, CA

2024 ***USENIX travel grant recipient for FAST24***, Santa Clara, CA

2022 ***Student Volunteer at SC22***, Dallas, TX

2023 ***Student Volunteer at SC23***, Denver, CO

Presentations

2024 **IPDPS24**, A conference present their latest research findings in all aspects of parallel computation and distributed processing. In addition to technical sessions of submitted paper presentations. I presented a poster at the IPDPS PhD forum our recent findings on the I/O interference project accomplished in collaboration with Lawrence Berkeley National Laboratory (LBNL).

2022 **MUG22**, A meeting sharing the recent advancements on MVAPICH (A library overlaying MPI), and how these improvements impact the applications. I presented a poster on my research on identification of the role of users in affecting the I/O performance of the HPC applications in collaboration with Oak Ridge National Laboratory (ORNL)

Computer skills

Programming Languages	Python, PyTorch, keras, R, C, C++, Advanced JAVA, Tensorflow, Go, Rust
Systems	Linux kernel programming, Slurm
Web Technologies	HTML 5, PHP, JSP, Javascript, Django, nodeJS
Database	SQL, MySQL, Apache, MSSQL

Teaching experience

Virginia Tech

Fall 2023 : **CS3214: Computer Systems, head TA**.

- Served as the head TA; creating the rubrics for the assignments and coordinating the logistics.

Spring 2023 : **CS3214: Computer Systems, instructor**.

- Giving presentations to one section (75 students) in parallel with two other sections taught by Godmar Back and Dan Williams.

Fall 2022 : **CS3214: Computer Systems, instructor**.

- Giving presentations to one section (75 students) in parallel with two other sections taught by Godmar Back and Huaicheng Li.

Summer 2022 **CS 3114: Data Structures and Algorithms, teaching assistant**.

- Grading, Office hours

Spring 2022 : **CS3214: Computer Systems, teaching assistant**, Virginia Tech.

- Grading assignments and projects, hosting office hours

Fall 2021 : **CS3214: Computer Systems, teaching assistant**.

- Grading assignments and projects, hosting office hours

Summer 2021 **CS2506: Computer Organization II, teaching assistant**.

- Grading, Office hours

Spring 2021 : **CS3704: Intermediate Software Design and Engineering, teaching assistant**.

- Grading assignments, hosting office hours

Fall 2020 : **CS1114: Introduction to Software Design, teaching assistant**.

- Grading assignments, hosting office hours and lab sessions

University of Tehran

Spring 2020 : **Artificial intelligence, teaching assistant**.

- hosted project help session, created a project assignment and homework assignment, grading

Fall 2019 : **Formal Methods in Software Engineering, teaching assistant**.

- created a project assignment and a homework assignment

Spring 2019 : **Programming Languages and Compilers, teaching assistant**.

- created and led the project course, hosted a help session for each phase of the project, grading

Fall 2018 : **Programming Languages and Compilers, teaching assistant**.

- created 2 homework assignments, grading the course project and homework assignments

Referees

Dr. Ali Butt
Professor, Department of Computer Science
Virginia Tech
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Dr. Jean Luca Bez
Data Management Research Scientist Scientific Data Division
Berkeley Lab, US
✉ jlbez@lbl.gov

Dr. Arnab Kumar Paul
Assistant Professor, Department of Computer Science and Information Systems
BITS Pilani, K K Birla Goa Campus, India
✉ arnabp@goa.bits-pilani.ac.in

Dr. Suren Byna
Professor, Department of Computer Science and Engineering (CSE)
The Ohio State University (OSU), US
✉ byna.1@osu.edu

Dr. Ahmad Maroof Karimi
HPC Operational Data Scientist in Analytics and AI Methods at Scale Group
Oak Ridge National Laboratory
✉ karimiahmad@ornl.gov