

M. TALHA IMRAN

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BRIEF BIOGRAPHY

I am looking for full-time opportunities in the broad area of datacenter scale systems, including: operating systems, memory systems, microservices, and cloud computing.

My recent work explores serverless scheduling techniques from cloud providers' perspective. I also collaborate with VMware Research on the design of user-space remote memory systems for disaggregated datacenters. Previously, I have worked at Facebook on characterizing programming complexity introduced by complicated hardware designs of programmable accelerators. Prior to graduate school, I worked for 3 years at Mentor Graphics (Siemens) on embedded systems software development tools.

EDUCATION

- **MS Computer Science and Engineering** (Aug 2018 – May 2021 Expected)
Pennsylvania State University
GPA: 3.93/4.00
Advisor: Aasheesh Kolli
- **Bachelor of Electrical Engineering** (Sep 2011 - Jun 2015)
National University of Sciences and Technology, Pakistan
GPA: 3.96/4.00 - Silver Medal
Ranked 2nd out of 141 students in graduating class of 2015

WORK AND RESEARCH EXPERIENCE

- Graduate Research Assistant, **Pennsylvania State University** (2.5 years: Aug 2018 - Present)
Current project: exploring serverless scheduling approaches from cloud providers' perspective to reduce costs (e.g. resource oversubscription) using our serverless testbed comprising open-source components including cluster manager, serverless frameworks, cloud infrastructure services, and distributed load generator.
- Intern, **VMware Research Group** (3 months: May 2020 - Aug 2020)
Collaborator (Aug 2020 - Present)
Mentor: Irina Calciu
We are developing a user-space remote memory system based on RDMA, Linux user-space page faults, and *io_uring* to improve portability and ease-of-adoption. We also characterized full-scale real-world applications to glean requirements for a transparent fine-grained remote memory system.
- Research Intern, **Facebook, Menlo Park** (3 months: May 2019 - Aug 2019)
Team: AI HW/SW Codesign
Mentor: Ehsan K. Ardestani
Performed first-order evaluation of Deep Learning (DL) accelerator microarchitecture specifications on DL networks for content comprehension (Transformers) and recommendation systems (SparseNN). We also devised an analysis methodology to characterize accelerators' SW-backend dev. cost arising from HW design complexity.
- Sr. SW Development Engineer, **Mentor Graphics (Siemens), Pakistan** (3 years: Aug 2017 – Jul 2018)
SW Development Engineer (Jul 2015 – Jul 2017)
Developed and maintained backend tools for development and debugging of OS (Linux, RTOS), hypervisor, and drivers for heterogeneous multi-core embedded systems. I worked on software tools for remote JTAG interface with GDB and bootstrap scratch codes to enable *build* and *debug* workflows for embedded boards from IDE.
- Undergrad Research Assistant, **RISE Research Center, NUST, Pakistan** (1 year: Aug 2014 – Jun 2015)
Software System & Tools for Humanoid Robots - Programmed humanoid NAO robots to play soccer autonomously as a team. I worked on system design, footstep planning and tools for realtime remote visualization. ([fun post](#))

SKILLS

- Professional programming proficiency: C++(17), C, Python, JAVA, BASH
- Low-level Systems Programming, Kubernetes, Serverless, RDMA, Performance Characterization, Embedded Systems, Scripting, Agile Development

PEER-REVIEWED PUBLICATIONS

- **M. Talha Imran**, Nadav Amit, Irina Calciu. **“Towards Disaggregated Memory Recommenders”** Personalized Recommendation Systems and Algorithms Workshop, Machine Learning and Systems (**PeRsonAI @ MLSys 2021**)
- Irina Calciu, **M. Talha Imran**, Ivan Puddu, Sanidhya Kashyap, Hasan Al Maruf, Onur Mutlu, Aasheesh Kolli. **“Rethinking Software Runtimes for Disaggregated Memory”** International Conference on Architectural Support for Programming Languages and Operating Systems (**ASPLOS 2021**).
- **M. Talha Imran**, Aasheesh Kolli. **“Rethinking Resource Disaggregation”**. Young Architect Workshop, International Symposium on High Performance Computer Architecture (**YArch @ HPCA 2019**)
- Idrees Hussain, **M. Talha Imran**, Abdul Haseeb Ayub, Shams Azeem, Maham Tanveer, Fahad Islam, and Yasar Ayaz. **“Designing of motions for humanoid goal keeper robots.”** In 2015 IEEE International Conference on Robotics and Biomimetics (**ROBIO 2015**)

TALKS

- **“Kona: Rethinking Software Runtimes for Disaggregated Memory”**, VMware Research (August 2020)
- **“KCacheSim: Simulating Fine-Grain Coherence-based Remote Memory”**, VMware Research (July 2020)
- **“Deep Learning Accelerators Programmability”**, Facebook HQ (Aug 2019)
- **“Rethinking Resource Disaggregation”**. Young Architect Workshop, International Symposium on High Performance Computer Architecture (HPCA 2019)

AWARDS, HONORS & SCHOLARSHIPS

- Grade-16 Graduate Assistantship at Pennsylvania State University (2018-2019)
Typically offered to final year students
- Team Role Model award at Mentor Graphics (Siemens) (2017, 2018)
2018: Legacy system redesign and implementation in C++17
2017: Ensuring timely support of the new Xilinx MPSoC board
- Robocup Standard Platform League qualification (2015)
Team lead of the only qualifying team from South Asia in this international robotics competition
- Chancellor's Silver Medal – Academics (2011-2015)
Ranked 2nd out of 141 students in graduating class of 2015

RELEVANT COURSEWORK

- Operating System Design (CSE-511)
Projects: Parallel Distributed File System using GRPC; Synchronization using Path Expressions
- Fundamentals of Computer Architecture (CSE-530)
Project: Survey of Disaggregated Memory Systems
- Language based Security (CSE-597 Special Topics)
Project: Survey of Secure Information Flow in Distributed Systems
- Beyond Von Neumann Computing: Technology and Architecture Interactions (CSE-597 Special Topics)
- Performance Evaluation (CSE-517)
- Algorithm Design and Analysis (CSE-565)

REFERENCES

- Dr. Aasheesh Kolli, Google, aasheesh@google.com
- Dr. Irina Calciu, Senior Researcher, VMware Research, icalciu@vmware.com
- Dr. Ehsan K. Ardestani, Research Scientist, Facebook, ehsanardestani@fb.com
- Prof. Anand Sivasubramaniam, Distinguished Professor, CSE, Penn State University, anand@cse.psu.edu