APOORVE MOHAN

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RESEARCH INTEREST

Broadly, I am interested in ***Systems and Networking***. My current research revolves around improving efficiency, security, and operation of bare-metal clusters.

EDUCATION

Northeastern University
- Ph.D. Computer Engineering *2014 - Present*
- Thesis Advisor(s): Prof. Gene Cooperman, Prof. Orran Krieger

University of Delhi
- M.Sc. Computer Science *2009 - 2011*
- B.Sc. (Hons.) Computer Science *2006 - 2009*

ONGOING/RECENT PROJECTS

- BareShala: Improving Resource Efficiency in Consolidated Data Centers
  A new data center architecture to enable short-term multiplexing of unused bare-metal servers between co-located clusters to improve aggregate resource efficiency in enterprise data centers.
- FLOCX: First Layer of Open Cloud Exchange
  A marketplace that enables trading of bare-metal resources between mutually non-trusting entities.
- NiBi: Non-Intrusive Bare-Metal Introspection
  A new system architecture that enable non-intrusive introspection of the software stack deployed on bare-metal clusters. *(To be published.)*
- Batchpool: Recycling Lost CPU Cycles in Batch Clusters
  A new job scheduling mechanism for single-node latency-tolerant jobs that leverages checkpoint-restart mechanism to improve throughput in batch clusters. *(To be published.)*

REFEREED PUBLICATIONS

- A.Mossayebzadeh, **A.Mohan**, S.Tikale, M.Abdi, N.Schear, T.Hudson, C.Munson, L.Rudolph, G.Cooperman, P.Desnoyers, O.Krieger, Supporting Security Sensitive Tenants in a Bare-Metal Cloud **(Usenix ATC 2019)** *(Co-first Author)*
- R.Garg, **A.Mohan**, M.Sullivan, G.Cooperman, CRUM: Checkpoint-Restart Support for CUDA's Unified Memory **(IEEE Cluster 2018)**
- A.Mossayebzadeh, G.Ravago, **A.Mohan**, A.Raza, S.Tikale, N.Schear, T.Hudson, J.Hennessey, N.Ansari, K.Hogan, C.Munson, L.Rudolph, G.Cooperman, P.Desnoyers, O.Krieger, A Secure Cloud with Minimal Provider Trust **(USENIX HotCloud 2018)**
- **A.Mohan**, A.Turk, R.S.Gudimetla, S.Tikale, J.Hennessey, U.Kaynar, G.Cooperman, P.Desnoyers, O.Krieger, M2: Malleable Metal as a Service **(IEEE IC2E 2018)**

RESEARCH EXPERIENCE

Graduate Research Assistant *2014 - Present*
Khoury College of Computer Sciences, Northeastern University, Boston
Advisor: Prof. Gene Cooperman
- Project: Efficient batch processing using user-space checkpoint-restart

Research Student *2015 - Present*
Massachusetts Open Cloud, Boston
Advisors: Prof. Orran Krieger

- Projects: Elastic secure infrastructure, Non-intrusive bare-metal introspection, Bare-Metal Resource Utilization Control System, Bare-Metal Exchange Marketplace

Summer Research Intern *2017, 2018*
IBM Research T.J. Watson, Yorktown Heights
Mentor: Dr. Gheroghe Almasi
- Projects: Dynamic partitioning of data centers at the bare-metal layer,
Analyzing system bottlenecks for distributed DNN training in commodity data centers

TEACHING EXPERIENCE

Teaching Assistant (Fall) *2016*
Khoury College of Computer Science, Northeastern University, Boston
- CS 5600 Computer Systems *(Graduate)*
- CS 3650 Computer Systems *(Undergraduate)*

Guest Lecturer *Spring, Fall 2013*
Maharaja Agrasen College, University of Delhi
- C++ Programming, Introduction to Computer Fundamentals *(Undergraduate)*

Assistant Professor (Adhoc) *Fall 2012*
Maharaja Agrasen College, University of Delhi
- MIPS and Shell Programming, Introduction to Computer Fundamentals *(Undergraduate)*

SOFTWARE DEVELOPMENT EXPERIENCE

Project Associate *2012 - 2014*
Indian Institute of Technology, Delhi
Advisors: Prof. Huzur Saran, Prof. Sorav Bansal
- Involved in design and development of an academic cloud *(https://baadal.nmeict.in)*

Software Developer *2011 - 2012*
One97 Communications Ltd., NOIDA
- Java-based full-stack development

TECHNICAL EXPOSURE

Programming and Scripting: Python, C/C++, Bash, Java
Parallel and Cluster Computing: pthreads, OpenMP, OpenMPI, CUDA, SLURM
System Profiling: perf, sysstat, tcpdump, fio, strace, ptrace, gdb
Cloud and Virtualization: OpenStack, KVM, QEMU, libvirt
Deep Learning: Caffe, Alexnet, Imagenet
Databases: MySQL, SQLite, PostgreSQL
Storage: Ceph, Software iSCSI (TGT/IET), RAID
Web: JavaScript, HTML, Web2py, CSS, JQuery, REST

TALKS AND POSTERS

- Agentless Bare-Metal Introspection **(MassOpenCloud Annual Workshop 2018)**
- Recycling Lost CPU Cycles **(New England Network and Systems Day 2017)**
- Marrying Cloud and HPC for Long-Term Happiness **(IBM Research Workshop 2017)**
- Elastic OpenStack Deployments **(OpenStack Summit-Boston 2017)**
- Bare Metal Imaging **(MassOpenCloud Annual Workshop 2016)**
- Marrying Cloud and HPC for Long-Term Happiness **(Supercomputing Conference 2016)**