# 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 clouds***.

## EDUCATION

**Northeastern University**
- Ph.D. Computer Engineering *(GPA: 3.92)* *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*

## SELECTED REFEREED PUBLICATIONS

Non-intrusive Software Introspection, **A.Mohan**, S.Nadgowda, B.Pipaliya, S.Varma, S.Suneja, C.Isci, G.Cooperman, P.Desnoyers, O.Krieger, A.Turk *(IEEE IC2E 2020)*

Supporting Security Sensitive Tenants in a Bare-Metal Cloud, A.Mossayebzadeh*, **A.Mohan***, S.Tikale*, M.Abdi, N.Schear, T.Hudson, C.Munson, L.Rudolph, G.Cooperman, P.Desnoyers, O.Krieger *(USENIX ATC 2019)*
*(*Co-first Author)*

M2: Malleable Metal as a Service, **A.Mohan**, A.Turk, R.S.Gudimetla, S.Tikale, J.Hennessey, G.Cooperman, P.Desnoyers, O.Krieger *(IEEE IC2E 2018)*

## 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.

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. *(Completed, to be published.)*

## RESEARCH EXPERIENCE

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

**Research Student** *2015 - Present*
*Massachusetts Open Cloud, Boston*
*Advisor: Prof. Orran Krieger*
- Projects: Elastic secure infrastructure, Non-intrusive bare-metal introspection, Bare-Metal Resource Utilization Control System, Bare-Metal Exchange Marketplace

**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

## SOFTWARE DEVELOPMENT EXPERIENCE

**Project Associate** *2012 - 2014*
*Indian Institute of Technology, Delhi*
- Involved in design and implementation of an IaaS cloud platform *(https://baadal.nmeict.in)*

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

## 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)*

## PRESENTATIONS

**Agentless Bare-Metal Introspection** *(MassOpenCloud Annual Workshop 2018)*

**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)*

## POSTERS

- **Recycling Lost CPU Cycles** *(New England Network and Systems Day 2017)*

- **Marrying Cloud and HPC for Long-Term Happiness** *(Supercomputing Conference 2016)*

## 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