Jashwant Raj Gunasekaran

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EDUCATION

PhD Student in *Computer Science and Engineering* **Aug '14 - Present**
Advisors: Dr Chita Das & Dr Mahmut Kandemir
CGPA 3.6/4, **Pennsylvania State University**, University Park,
Concentration in **Cloud Computing Systems**

Bachelor of Engineering in *Computer Science and Engineering* **Aug '09 - May '13**
CGPA 8.24/10, Anna University, Chennai, India

RESEARCH FOCUS

I work on **resource management in cloud** with specific focus on **Machine learning** applications, to optimize for (i) tenant-side performance & cost and (ii) provider-side energy efficiency & utilization. Looking for potential opportunities in **Distributed Cloud HPC systems research.** I am also interested in exploiting heterogeneity in datacenters and characterizing overall system performance.

PUBLICATIONS

*Tackling **Resource Under-utilization** in the **Serverless** Era.* ***(Middleware'20)***.

*Multidimensional Optimization of **Ensemble learning**-based inference serving.* ***(NSDI-revision)***.

*Characterizing bottlenecks in hosting **microservices** on **Serverless** Functions Chains.* ***(ICDCS'20)***.

*Implications of Public Cloud Resource for **Model Serving** Applications.* ***(WoSC'20)***.

Dynamic VM provisioning** for High Performance Computing platforms.* ***(CCGrid'20).

Energy harvesting** through dynamic orchestration in **GPU**-based Datacenters.* ***(CLUSTER'19).

*Exploiting **Serverless Functions** for SLO and Cost Aware Resource Procurement.* ***(CLOUD'19)***.

***Constraint aware scheduling** for Cloud Systems:* Developed a trace driven scheduler for constraint aware scheduling in heterogeneous cloud architectures **(ICDCS'17)**.

INDUSTRY EXPERIENCE

***Intern- VMware Office of CTO**, Boston MA* **Jun '19 - Aug '19**

- Design a proof-of-concept integration between HPC job scheduling mechanisms and VMware virtualization software to help create a dynamic virtual machine provisioning model for virtualized HPC. The work was published in CCGRID'20.

Intern- Qualcomm Inc

- Part of wifi firmware team. Worked on adding a new software power management feature into existing MAC firmware module. **Jun '16 - Aug '16**
- Part of the Android power optimization, I developed a tool to enable log collection and process the logs to obtain critical power utilization metrics. **Jun '15 - Aug '15**

***Software Engineer- Qualcomm Inc**, Chennai India* **Jun '13 - Jul '14**

- Developed coded tests to validate the various Qualcomm proprietary features and also automated several wifi functionality tests. Technologies Used: SWAT automation, Networking protocols, Perl.Proposed a patent application named Processor Capacity Sharing

INTERESTED DOMAINS

Performance Evaluation, Workload profiling and characterization, ***Cloud computing:*** Public Cloud, Serverless Computing, Docker Containers, Kubernetes, Distributed resource management **Operating Systems:** Virtualization, Linux Kernel Development, Device Drivers and Firmware.

TECHNICAL SKILLS

Cloud services:** Docker containers, Mesos, Kubernetes, AWS lambda, Azure ML,* ***Programming : C, C++, Python, JavaScript, Bash/Shell, Java, OpenMP ***ML frameworks:*** Tensorflow, Mxnet, Pytorch ***DataBase Technologies :*** MYSQL,Oracle ***Web Technologies:*** HTML, CSS, XML

RELEVANT COURSE WORK	Graduate Operating Systems, Graduate Computer Architectures, Data Structures and Algorithms, Object Oriented Programming using Java and C, Multiprocessor Architecture, Public Cloud Computing,
COURSE PROJECTS	***Distributed file system:*** Developed a parallel distributed file system (like NFS) which handles all file handling and multiple user file access.
	Slab Memory Allocator: Developed memory allocation scheme based on buddy and slab level allocation policies used in linux kernels.
	Implementing Cache: Developed L1 cache architecture with various cache replacement policies.
	Multithreaded synchronization: Designed a thread-level synchronization mechanism using path expression which directs the rules for desired order of execution for multiple real application scenarios.
	Multilevel thread scheduler: Designed a multilevel thread FCFS, SJB and MLFQ scheduler for a realtime Operating System.
TEACHING EXPERIENCE	Teaching and instruction assistant for undergraduate **programming practice** course, undergraduate and graduate **operating systems** course.
PROPOSAL WRITING	Re-Engineering Galaxy for Performance, Scalability and Energy Efficiency, NSF Award #1931531.
	Cross-Layer Design for Cost-Effective HPC in the Cloud, NSF Award #2028929