Jashwant Raj Gunasekaran

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Objective

I am a recent PhD graduate (May 2021), actively looking for full-time opportunities pertaining to cost and performance optimization in *Heterogeneous Cloud computing* infrastructure with emphasis on *Machine Learning* workloads.

Education

Spring'17 – Summer'21 — **Ph.D.** Computer Science and Engineering, **Pennsylvania State University**
Thesis: *Maximizing Resource Efficiency for Next-Gen Cloud Platforms.*
Advisors: Dr Chita Das & Dr Mahmut Kandemir

Fall'2014 – Fall'2016 — **M.S.** Computer Science and Engineering, **Pennsylvania State University**

2009 – 2013 — **B.E.** Computer Science and Engineering, **MIT**, Anna University

Industry Experience

Jun-Aug 2019 — **Research Intern-,** VMWare Office of CTO, Boston MA.
Designed a dynamic virtual machine provisioning model for HPC, that enabled VMware HPC customers to automate virtual cluster management. The work was published in *CCGRID'20.*

Jun-Aug 2016 — **Engineering Intern,** Qualcomm Inc, San Jose CA.
As a part of WiFi firmware team, integrated a new software power management feature into existing MAC firmware module. This led to significant power savings in Snapdragon 835.

Jun-Aug 2015 — **Engineering Intern,** Qualcomm Inc, San Diego CA.
As a part of the Android power team, developed a log collection and processing tool that enabled measurement of power utilization metrics and further optimize power consumption of Snapdragon 820.

2013 – 2014 — **Software Engineer,** Qualcomm Inc, Chennai, India.
Worked on Test Automation, Product Verification and Validations for Modems. Worked on a *patent* named Processor Capacity Sharing.

Research Publications

Conference Proceedings

- Multidimensional Optimization for Inference serving in Public Cloud. **NSDI'2022**
  Jashwant Gunasekaran, C. Mishra, Prashanth Thinakaran, B. Sharma, Mahmut Kandemir, Chita Das
- Fifer: Tackling Resource Underutilization in the Serverless Era. **MIDDLEWARE'2020**
  Jashwant Gunasekaran, Prashanth Thinakaran, N. Chidambaram, Mahmut Kandemir, Chita Das
- Multiverse: Dynamic VM Provisioning for Virtualized HPC Clusters. **CCGRID'2020**
  Jashwant Gunasekaran, Prashanth Thinakaran, M. Cui, Josh Simons, Mahmut Kandemir, Chita Das
- Spock: Exploiting Serverless Functions for SLO & Cost-Aware Inference Serving. **CLOUD'2019**
  Jashwant Gunasekaran, Prashanth Thinakaran, Mahmut Kandemir, B. Urgaonkar, G. Kesidis, Chita Das
- Resource Harvesting through Dynamic Container Orchestration in GPU-based Datacenters. **CLUSTER'2019**
  Prashanth Thinakaran, Jashwant Gunasekaran, B. Sharma, Mahmut Kandemir, Chita Das
- Phoenix: A Constraint-aware Scheduler for Heterogeneous Datacenters. **ICDCS'2017**
  Prashanth Thinakaran, Jashwant Gunasekaran, B. Sharma, Mahmut Kandemir, Chita Das

Workshop and Poster

- GYAN: Accelerating Bioinformatics tools in Galaxy with GPU-Aware Computation Mapping **HiCOMB'2021**
  Gulsum Gudukbay, Jashwant Gunasekaran, Mahmut Kandemir, Anton Nekrutenko, Chita Das et al.
- Implications of Public Cloud Resource Heterogeneity for Inference Serving. **WoSC'2020**
  Jashwant Gunasekaran, Cyan Mishra, Prashanth Thinakaran, Mahmut Kandemir, Chita Das
- Characterizing Bottlenecks for Microservices on Serverless Platforms. (Poster) **ICDCS'2020**
  Jashwant Gunasekaran, Prashanth Thinakaran, N. Chidambaram, Mahmut Kandemir, Chita Das
- The Curious Case of Container Orchestration in GPU-based Datacenters. (Poster) **SoCC'2018**
  Prashanth Thinakaran, Jashwant Gunasekaran, B. Sharma, Mahmut Kandemir, Chita Das

Skills

- **Coding:** Python, c++/c, Java, JavaScript/Nodejs, Bash,
- **Cloud:** Docker, Kubernetes, AWS, AWS-Lambda, SageMaker, Azure-ML, IaaS, PaaS, FaaS
- **ML:** Tensorflow, Mxnet, Pytorch
- **Databases:** Mysql, Oracle sqlite, Cassandra, DynamoDB, AWS-S3, Redis
- **Web:** Dev Html, css, XML, LaTeX
- **Languages:** Strong reading, writing and speaking competencies in English, Hindi, Tamil. French intermediary.

Teaching Experience

Teaching Assistant

- 2014-2016: Introduction to Programming C++ and Python
- Fall 2018: Undergraduate Operating Systems
- Spring 2019: Programming Language Concepts
- Fall 2019: Graduate Operating Systems

Instructor in Fall 2017 for Introduction to BASH/Shell.

Academic Experience

Course work: Operating Systems, Machine Learning and Bigdata, Applied Data Mining, Cloud Computing, Computer Architecture, Data Structures and Algorithms, Object Oriented Programming C++, Multiprocessor Architecture.

Course Projects

- **Distributed file system:** Developed a parallel distributed file system (like NFS).
- **Slab Memory Allocator:** Developed memory allocation schemes based on buddy and slab policies 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.
- **Multilevel thread scheduler:** Designed a multilevel thread FCFS, SJB and MLFQ scheduler.

Miscellaneous Experience

Mentoring: Currently advising 4 PhD students and 1 MS student.

Proposal Writing

- Re-Engineering Galaxy for Performance, Scalability and Energy Efficiency, NSF Award #1931531 (Amount 3.5M).
- Cross-Layer Design for Cost-Effective HPC in the Cloud, NSF Award #2028929 (Amount 250K).

Honors and Awards

Awards and Achievements

2014 **Merit Award**, Twice awarded QualStar for best performing member in the team.
2009 **Merit Award**, High School- Subject Topper in Chemistry.

Student Travel Award from IEEE/NSF for ICDCS'2017 and CLUSTER'2019 conferences.

Services and Memberships

- Official Reviewer for IEEE Journals: TC, TCC, TPDS, TSC
- On-behalf Reviewer for SIGMETRICS, PACT, IISWC, ISPASS, CGO, PPoPP, PLDI, ISCA, MICRO.
- Student Member of IEEE, ACM, SIGARCH, IEEE Computer Society.

References

Prof. Chita R. Das
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Pennsylvania State University
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Prof. Mahmut Kandemir
Distinguished Professor
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Dr. Michael Cui
Senior MTS
VMware Inc.
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Sr. Director & Chief Technologist
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