

# MAHESH LAKSHMINARASIMHAN

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## EDUCATION

- 2019-Present Ph.D. Computer Science, University of Utah, USA.  
Advisor : Dr. Mary W. Hall
- 2017-2019 M.S. Computer Science, Boise State University, ID, USA.  
CGPA : 3.89  
Advisor : Dr. Catherine Olschanowsky  
Thesis : Application-Specific Memory Subsystem Benchmarking
- 2012-2016 B.E. Computer Science - Anna University, Chennai, India.  
CGPA : 9.1/10 (Equivalent to *summa cum laude*)  
Final Year Project : Solar Autonomous Robot for Deweeding Agricultural Fields

## EMPLOYMENT

- Present**  
**August 2019** | **Graduate Research Assistant | School of Computing, University of Utah, UT, USA**  
> Developing autotuning compiler for optimizing the performance of Ordinary Differential Equation (ODE) solvers in AMReX-based applications targeted at GPU-accelerated systems.  
`C` `C++` `Python` `FORTRAN` `CUDA` `Git` `Make` `Shell Scripting` `Slurm` `LSF`
- August 2019**  
**May 2019** | **Computer Systems Engineer - I | Performance and Algorithms Research Group, Computational Research Division, Lawrence Berkeley National Laboratory, CA, USA**  
Mentor : Dr. Samuel W. Williams, Supervisor : Dr. Erich Strohmaier.  
> Collaborated with the Centre for Computational Science and Engineering (CCSE) in analyzing and optimizing the performance of ODE solvers in AMReX-based code suites for many-core architectures.  
`C++` `Python` `FORTRAN` `CUDA` `OpenMP` `MPI` `Git` `Make` `Shell Scripting` `Slurm`
- Present**  
**September 2017** | **Graduate Research Assistant | ADaPT - Data Flow Optimizations Lab, Boise State University, ID, USA**  
> Developed AdaptMemBench, a configurable memory performance benchmarking framework leveraging the polyhedral model. Extending the framework to distributed memory applications and GPUs.  
> Built a machine-learning and tensor-processing based streaming HPC benchmark to characterize the performance of HPC systems. This benchmark will be incorporated into the Graph500 open infrastructure for analytics benchmarking.  
`C` `C++` `Python` `OpenMP` `MPI` `Pthreads` `Shell Scripting` `Git` `Make` `Slurm`
- July 2017**  
**June 2016** | **Software Development Engineer | R&D Labs, IVTL INFOVIEW TECHNOLOGIES/WORKSAP INC., India/Japan**  
> **High Usability Interface (HUE)** : Built a framework that autonomously retrieves data from database and sends to an automated system for computational analysis and prediction for AI-enabled ERP.  
> **Intraweb** : A tool that transforms a desktop application in Pascal into a web-compatible application.  
`Java` `Javascript` `XML` `Pascal` `Cassandra` `Git` `Tomcat` `Maven` `Eclipse`
- March 2016**  
**May 2015** | **Undergraduate Research Assistant | SKCET, ANNA UNIVERSITY, India**  
> Designed and developed *Agribot* - A solar autonomous agricultural robot that deweeds crop fields.  
> My major contribution was in the enhancement and implementation of the existing image classification algorithms for weed detection with improved efficiency and accuracy.  
`Java` `Python` `Shell Scripting` `Make` `Git` `Raspberry Pi`

## RESEARCH ACTIVITIES

**Research Interests** High Performance Computing, Compiler and Memory Optimization, Automatic Performance Tuning, Performance Modeling and Benchmarking, Memory traffic reduction, Hardware/software co-design.

### Publications

- > Jiajia Li, **Mahesh Lakshminarasimhan**, Ang Li, Cathie Olschanowsky, Kevin Barker. PASTA: A Parallel Sparse Tensor Algorithm Benchmark Suite, Principles and Practice of Parallel Programming (PPoPP) 2020 (To appear).

- > **Mahesh Lakshminarasimhan**, Catherine Olschanowsky. AdaptMemBench : Application-Specific Memory Subsystem benchmarking, Technical Report, 2018. <https://arxiv.org/abs/1812.07778>
- > **Mahesh Lakshminarasimhan**. Application-Specific Memroy Subsystem Benchmarking, Masters Thesis, 2019. <https://doi.org/10.18122/td/1534/boisestate>
- > Sujaritha, M., Annadurai, S., Satheeshkumar, J., Sharan, S. K., & **Mahesh Lakshminarasimhan**. (2017). Weed detecting robot in sugarcane fields using fuzzy real time classifier. Elsevier Journal of Computers and electronics in agriculture, 134, 160-171. <https://doi.org/10.1016/j.compag.2017.01.008>
- > Sujaritha, M., **Mahesh Lakshminarasimhan**, Colin Fernandez, & M. Chandran. Greenbot : a solar autonomous robot to uproot weeds in a grape field. International Journal of Computer Science and Engineering 4, no. 2 (2016) : 1351-1358. <https://pdfs.semanticscholar.org/256e/a6a435f89ad325e3ca34eb0316260e0d17dd.pdf>

#### Talks and Posters

- > **Mahesh Lakshminarasimhan**, Kowshik Sharan, *Best Student Paper Award* under late-break research category for "Bionic Computers- A Biologically Integrated Device", IEEE International Conference on Engineering and Technology, Coimbatore, India, 2016. [https://www.researchgate.net/publication/310022542\\_Bionic\\_Computers](https://www.researchgate.net/publication/310022542_Bionic_Computers)
- > **Mahesh Lakshminarasimhan**, An Application-Specific Microbenchmark for Memory Access. *Research poster* presented at the Idaho Graduate Research Conference, Boise State University, 2018. [https://scholarworks.boisestate.edu/gss\\_2018/38/](https://scholarworks.boisestate.edu/gss_2018/38/)

#### ACCOMPLISHMENTS

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- > Awarded School of Computing Graduate Fellowship, University of Utah, 2019-2020.
- > Awarded Graduate College Research Fellowship, University of Arizona, 2019-2020 (Declined).
- > Recipient of Graduate Assistantship, Department of Computer Science, Boise State University, 2017-2019.
- > Awarded the Best Undergraduate Project in Computer Science for the academic year 2015-2016 by Anna Univesity, Chennai, India for the final year project titled *Solar Autonomous Robot for Deweeding Agricultural Fields*.
- > Certified as Oracle Certified Professional, Java SE 6 Programmer.

#### TECHNICAL EXPERTISE

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<b>Programming Skills</b>	C, C++, Java, Python, MATLAB/Octave, Fortran, Haskell, Javascript, Shell Scripting
<b>HPC Tools</b>	MPI, OpenMP, CUDA, Pthreads, NVIDIA nvprof/Nsight, Intel VTune/SDE, LIKWID
<b>Database</b>	Cassandra, MongoDB, Oracle Database, Microsoft SQL Server, MySQL
<b>Development Tools</b>	IntelliJ Idea, Eclipse, NetBeans, Visual Studio Code, Sublime, Git, Maven, Make