

# Akhil Guliani

Madison, Wisconsin, USA  
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- OBJECTIVE** Looking for full time software developer roles. Masters degree holder with a history of working in higher education, research and industry; with skills in management, system design, and data analysis. Areas of interest include Virtualization technologies, Distributed and large scale systems, Datacenter design and operation, and IoT systems.
- SKILLS**
- **Programming Languages:** Python , C (Proficient) | C++, C#, Java, CUDA, HIP, L<sup>A</sup>T<sub>E</sub>X, Julia, Bash (Familiar)
  - **Software Skills:** Linux Scripting (Intermediate) | Linux Power Management, GEM5, MATLAB, LabView, Android, Arduino (Familiar)
- INDUSTRIAL EXPERIENCE**
- Advanced Micro Devices, Inc. (AMD),** Austin, Texas, USA
- Co-Op Engineer Jan 2019 – Aug 2019
    - Worked on prototyping and bringing up a port for full GPU software stack (ROCm, including their Linux kernel driver, userspace runtime, compiler toolchain and higher level interface) for next generation GPU architecture.
    - Built a python utility to help build and do regression testing on internal builds of ATMI toolchain.
- GAIL (India) Ltd.,** New Delhi, India
- Senior Engineer (Instrumentation) Sep 2012 – Jul 2014
    - Project Execution engineer in the GAIL Petro-Chemicals-II Expansion Project in Pata, UP, India
    - Responsible for execution of jobs related to Process Instrumentation System used, including procurement, inspection, erection, pre-commissioning and commissioning activities
- Air India Ltd. ,** New Delhi, India
- Industrial Trainee Dec 2011 – Jan 2012
    - Industrial Internship at Air India's Northern Engineering Office at IGI Airport, New Delhi
    - Gained exposure to operation and maintenance of components for Aircraft Control systems
- ACADEMIC EXPERIENCE**
- Research Experience**
- University of Wisconsin-Madison Oct 2016 – Aug 2018
    - Worked on developing per-application power delivery scheme to improving operating system power management (OSPM) utilities for datacenters [3]
  - Northwestern University Jul 2015 – Mar 2016
    - Department of Preventive Medicine, Developed the machine learning pipeline and firmware for a wearable eating detection system
    - EECS Department, Worked on architectural simulations using GEM5 to analyze an applications thermal and performance impact due to varying architectural configurations [4]
    - EECS Department, Worked on novel thermal aware static scheduling system for high performance accelerators using thermal prediction [1]
- Teaching Experience**
- Department of Computer Sciences, University of Wisconsin-Madison Sep 2018 – May 2021
  - EECS Department, Northwestern University Sep 2015 – Dec 2015
    - CS 220, 400, 537, 542 & 639 Intro. to Data Science, Programming (III), Operating Systems and Software Security
    - EECS 339 Intro. to Database Systems
    - Designed lessons and course materials including feedback and assessment tools for project based learning
    - Managed classes with enrollment sizes varying from 100 to 800 students, team sizes of upto 27 course staff, which included holding regular 1 on 1 mentoring sessions and facilitating large discussions
    - Developed and managed the communication strategy for a large enrollment (800) course. This included developing automation scripts to efficiently distribute students among course staff for feedback
- EDUCATION**
- University of Wisconsin-Madison,** Madison, Wisconsin, USA
- Master of Science (M.S) in Computer Sciences Aug 2016 – Expected 2021
    - Cumulative GPA: 3.8 / 4.00
    - Research areas: Computer Systems, Architecture, Machine Learning
- Northwestern University,** Evanston, Illinois, USA
- Master of Science (M.S.) in Computer Engineering Sep 2014 – Mar 2016
    - Cumulative GPA: 3.92 / 4.00
    - Research areas: Computer Systems, Memory Management, Embedded Systems, Architecture, Machine Learning
- Netaji Subhas Institue of Technology,** University of Delhi, New Delhi, India
- Bachelor of Engineering (B.E.) in Instrumentation & Control Aug 2008 – Jun 2012
    - Graduated with distinction
    - Cumulative %age: 76.6 / 100

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| <b>PROJECTS</b> | <b>Power Management and Scheduling [3]</b>   | 2016 – 2021 |
|                 | <ul style="list-style-type: none"> <li>▪ Currently working on exploring power delivery policies in GPUs and their implications on application performance in large GPU clusters</li> <li>▪ Previously, surveyed power delivery and control mechanisms provided by modern processors and SoCs</li> <li>▪ Built a userspace utility in Python to apply power delivery policies for apps running under constrained power</li> <li>▪ Built an MILP optimization model for describing the policies in Julia using JuMP</li> </ul> |             |
|                 | <b>Implementing Device File Virtualization for Palacios Virtual Machine Monitor (VMM) [4]</b>  | 2015 – 2016 |
|                 | <ul style="list-style-type: none"> <li>▪ Built Proof of concept for device virtualization at the device file boundary for Palacios VMM</li> <li>▪ Allows an unmodified Linux guest to access the devices present in an unmodified Linux host using a VMM supported system call forwarding interface</li> </ul>   |             |
|                 | <b>Temperature Prediction for Runtime Thermal Management across System Components [1]</b>  | 2015 – 2016 |
|                 | <ul style="list-style-type: none"> <li>▪ Integrated an machine learning (ML) pipeline for application temperature prediction with a static job scheduler</li> <li>▪ Optimized the input and training of these ML Models to reduce prediction time</li> <li>▪ Used Python language with Pandas, Sci-kit learn and PyBrain libraries to build the system</li> </ul>  |             |
|                 | <b>Tools for providing data-driven feedback to improve project based teaching</b>  | 2020        |
|                 | <ul style="list-style-type: none"> <li>▪ Developed tools to capture and respond to student queries related to programming exercises in an intro course</li> <li>▪ Developed data driven pipeline to identify points of interest to improve related course materials and instruction</li> </ul>   |             |
|                 | <b>Exploring Big-Data Systems</b>  | 2017        |
|                 | <ul style="list-style-type: none"> <li>▪ Built sample Map-Reduce applications using Hadoop, and Spark</li> <li>▪ Built a real-time tweet processing streaming application on Apache Storm and Flink</li> <li>▪ Explored graph analysis using GraphX</li> </ul>   |             |

## JOURNAL

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| <b>PUBLICATIONS</b> | [1] Kaicheng Zhang, Akhil Guliani, Seda Ogrenci-Memik, Gokhan Memik, Kazutomo Yoshii, Rajesh Sankaran, Pete Beckman, “Machine Learning-Based Temperature Prediction for Runtime Thermal Management across System Components”, <i>IEEE Trans. Parallel Distrib. Syst.</i> , 2018  |
|                     | [2] Renu Guliani, Amit Jain, Swati Sharma, Davinder Kaur, Akhil Guliani, Avinashi Kapoor, “Analysis of Electrical Characteristics using a Lambert W-Function Technique and MATLAB Simulation for Dye Sensitised ZnO Solar Cell”, <i>The Open Renewable Energy Journal</i> , 2013 |

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| <b>CONFERENCE PUBLICATIONS</b> | [3] Akhil Guliani, Michael Swift “Per-Application Power Delivery”, in <i>Eurosys 2019</i> , Dresden, Germany, Mar 2019   |
|                                | [4] Dawei Li, Kaicheng Zhang, Akhil Guliani, Seda Ogrenci-Memik “Adaptive Thermal Management for 3D ICs with Stacked DRAM Caches”, in <i>DAC 2017</i> , Austin, Texas, USA, Jun 2017 |
|                                | [5] Peter Dinda, Akhil Guliani “Dark Shadows: User-level Guest/Host Linux Process Shadowing”, in <i>IEEE IC2E 2017</i> , Vancouver, Canada, Apr 2017 <b>[Best Paper]</b>             |
|                                | [6] Akhil Guliani “The Study and Implementation of Natural User Interface using Kinect”, in <i>IEEE Indicon</i> , Kochi, Kerala, India, Dec 2012                                     |