

Janki Bhimani

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RESEARCH INTERESTS

Memory and Storage Systems; Datacenter Endurance and Reliability Management; High-Performance Computing; Performance Modeling and Prediction; Capacity Planning; Resource Management; Applied Machine Learning.

EDUCATION

Doctor of Philosophy (Ph.D.), Computer Engineering Aug 2019

Northeastern University, Boston, MA, USA

Dissertation: Enhancing Efficiency and Endurance of Flash-Based Storage for Big Data Processing on Enterprise Cloud and Datacenter

Master of Science (MS), Computer Engineering Jan 2016

Northeastern University, Boston, MA, USA

MS research: FiM - Fine grained Model to Predict Heterogeneous Computing Platforms Performance

Bachelor of Technology (BTech), Electrical & Electronics Engineering Aug 2013

GITAM University, Vishakhapatnam, India

Major: Robotics and Programming of Embedded Systems, Minor: Circuit Design, Power Management

FULL-TIME ACADEMIC EXPERIENCE

Assistant Professor Aug 2019 - Current

School of Computing and Information Science

Florida International University, Miami FL, USA

PART-TIME ACADEMIC EXPERIENCE

Volunteering Affiliated Faculty Aug 2019 - Current

Center for Womens and Gender Studies (CWGS)

Florida International University, Miami FL, USA

Instructor Sep 2017 - Dec 2017

College of Engineering

Northeastern University, Boston MA, USA

NON-ACADEMIC EXPERIENCE

Software Development Infrastructure Engineer (Intern) May 2018 - Aug 2018

Samsung Semiconductors Inc. Research Lab, San Jose, CA, USA

Performance Engineer (Intern) May 2017 - Aug 2017

Samsung Semiconductors Inc. Research Lab, San Jose, CA, USA

Engineer - Performance Architect (Intern)
Samsung Semiconductors Inc. Research Lab, San Jose, CA, USA

May 2016 - Aug 2016

Graduate Research Assistant May 2014 - Dec 2015, Sep 2016 - Apr 2017, Jan 2018 - Apr 2018, Sep 2018 - Jun 2019
College of Engineering
Northeastern University, Boston MA, USA

Graduate Teaching Assistant
College of Engineering, and
Northeastern University, Boston MA, USA

Jan 2016 - Apr 2016, Sep 2017 - Dec 2017

Student Chair
GITAM University Student Activity Center (GUSAC), India

May 2011 - May 2013

IC Design Intern
Energy Options, Rajkot, India

Jun 2012 - Jul 2012

PROFESSIONAL HONORS, AWARDS, PRIZES, AND FELLOWSHIPS

1. 2020 Grace Hopper Celebration of Women in Computing (GHC) Faculty Scholarship
2. 2019 Outstanding Graduate Research Award, Northeastern University
3. 2018 The Best Paper Award at 11th IEEE International Conference on Cloud Computing (IEEE CLOUD)
4. 2017 The Best Paper Award at 36th IEEE International Performance Computing and Communications Conference (IPCCC)
5. 2014 Double Husky Scholarship, Northeastern University
6. 2012 The Best Budget Robot Award at 3rd Lunabotics International Mining Competition, NASA, Kennedy Space Center, FL
7. 2012 The Best Working Model Award in Junk Yard Wars at Conscientia, Indian Institute of Space Science Technology (IIST)
8. 2012 The Best Paper Award at Aagama National Level Technical Paper Contest
9. 2011 The Best Working Model in Junk Yard Wars during Technozion at National Institute Of Technology (NIT)
10. 2011 The Outstanding Debate Performance Award by Institute of Engineers India (IEI)
11. 2010 The Impromptu Speaker Award by International Society for Technology in Education (ISTE)
12. 2010 - 2013 University Merit Scholarship, GITAM University

FUNDED RESEARCH GRANTS

1. **2019 Samsung Semiconductor Inc. Equipment Grant** **PI**
Key-Value SSDs
Total Value: \$6,000 (Direct+Indirect) My share: \$6,000 (100%)
Start date: Oct 1, 2019 Expiration date: Sep 30, 2021

2. **2019-2020 FIU Faculty Grantsmanship Development Program** **Co-PI**
 Design, Development and Testing of Distributed Computing Framework for globally coordinated data submission and accessibility of Mass Spectrometry Data
 Total Value: \$25,000 (Direct+Indirect) My share: \$5,000 (20%)
 Start date: Nov 1, 2019 Expiration date: May 30, 2020
3. **2020-2023 NSF CISE Core** **PI**
 CNS-2008324 - Small: New Techniques for I/O Behavior Modeling and Persistent Storage Device Configuration
 Total Value: \$500,000 (Direct+Indirect) My share: \$255,071 (51%)
 Start date: May 1, 2020 Expiration date: Apr 30, 2023

PUBLICATIONS IN DISCIPLINE

Refereed Journal Publications

1. Janki Bhimani, Ningfang Mi, Miriam Leeser, and Zhengyu Yang, New Performance Modeling Methods for Parallel Data Processing Applications, ACM Transactions on Modeling and Computer Simulation (TOMACS), 2019. DOI 10.1145/3309684.
2. Zhengyu Yang, Manu Awasthi, Mrinmoy Ghosh, Janki Bhimani, and Ningfang Mi, I/O Workload Management for All-Flash Datacenter Storage Systems Based on Total Cost of Ownership, IEEE Transactions on Big Data (TBDSI), Special Issue on the Integration of Extreme Scale Computing and Big Data Management and Analytics, 2018. DOI 10.1109/TBDATA.2018.2871114.
3. Janki Bhimani, Zhengyu Yang, Ningfang Mi, Jingpei Yang, Qiumin Xu, Manu Awasthi, Rajinikanth Pandurangan, and Vijay Balakrishnan, Docker Container Scheduler for I/O Intensive Applications running on NVMe SSDs, IEEE Transactions on Multi-Scale Computing Systems (TMSCS), 2018. DOI: 10.1109/TMSCS.2018.2801281.
4. Zhengyu Yang, Janki Bhimani, Yi Yao, Cho-Hsien Lin, Jiayin Wang, Ningfang Mi, and Bo Sheng, AutoAdmin: Admission Control in YARN Clusters Based on Dynamic Resource Reservation, Scalable Computing: Practice and Experience, Special Issue on Advances in Emerging Wireless Communications and Networking (SCPE), 2018. Volume 19, Number 1, pp. 5367.
5. Zhengyu Yang, Yufeng Wang, Janki Bhimani, Chiu C. Tan, and Ningfang Mi, EAD: Elasticity Aware Deduplication Manager for Datacenters with Multi-tier Storage Systems, Cluster Computing (CC), 2018. <https://doi.org/10.1007/s10586-018-2141-z>.
6. Zhengyu Yang, Janki Bhimani, Jiayin Wang, David Evans, and Ningfang Mi, Automatic and Scalable Data Replication Manager in Distributed Computation and Storage Infrastructure of Cyber-Physical Systems, Scalable Computing: Practice and Experience, Special Issue on Communication, Computing, and Networking in Cyber-Physical Systems (SCPE), 2018. Volume 18, Number 4, pp. 291311.

Highly Selective Conference Publications

Acceptance rates 30%

7. Danlin Jia, Manoj Pravakar Saha, Janki Bhimani, and Ningfang Mi, "Performance and Consistency Analysis for Distributed Deep Learning Applications", 2020 International Performance Computing and Communications Conference (IPCCC20), Virtual using Zoom, 2020. Acceptance Rate: 29.3%.
8. Janki Bhimani, Rajinikanth Pandurangan, Ningfang Mi, and Vijay Balakrishnan, Emulate Processing of Assorted Database Server Applications on Flash-Based Storage in Datacenter Infrastruc-

- tures, 2019 International Performance Computing and Communications Conference (IPCCC19), London, UK, 2019. Acceptance Rate: 29.2%.
9. Danlin Jia, [Janki Bhimani](#), Son Nam Nguyen, Bo Sheng, and Ningfang Mi, ATuMm: Auto-tuning Memory Manager in Apache Spark, 2019 International Performance Computing and Communications Conference (IPCCC19), London, UK, 2019. Acceptance Rate: 29.2%.
 10. [Janki Bhimani](#), Tirthak Patel, Ningfang Mi, and Devesh Tiwari, What does Vibration do to Your SSD?, 2019 Design Automation Conference (DAC19), Las Vegas, NV, 2019. Acceptance Rate: 24.3%.
 11. [Janki Bhimani](#), Ningfang Mi, Zhengyu Yang, Jingpei Yang, Rajinikanth Pandurangan, Changho Choi and Vijay Balakrishnan, FIOS: Feature Based I/O Stream Identification for Improving Endurance of Multi-Stream SSDs, 2018 IEEE International Conference on Cloud Computing (CLOUD'18), San Francisco, CA, 2018. Acceptance Rate: 15%. (*Best Paper Award*)
 12. [Janki Bhimani](#), Ningfang Mi, and Bo Sheng, BloomStream: Data Temperature Identification for Flash Based Memory Storage Using Bloom Filters, 2018 IEEE International Conference on Cloud Computing (CLOUD'18), San Francisco, CA, 2018. Acceptance Rate: 15%.
 13. Zhengyu Yang, Morteza Hoseinzadeh, Ping Wong, John Artoux, Clay Mayers, David Thomas Evans, Rory Thomas Bolt, [Janki Bhimani](#), Ningfang Mi, and Steven Swanson, H-NVMe: A Hybrid Framework of NVMe-based Storage System in Cloud Computing Environment, IEEE International Performance Computing and Communications Conference (IPCCC'17), San Diego, CA, 2017. (*Best Paper Award*)
 14. Zhengyu Yang, Morteza Hoseinzadeh, Allen Andrews, Clay Mayers, David Thomas Evans, Rory Thomas Bolt, [Janki Bhimani](#), Ningfang Mi, and Steven Swanson, AutoTiering: Automatic Data Placement Manager in Multi-Tier All-Flash Datacenter, IEEE International Performance Computing and Communications Conference (IPCCC'17), San Diego, CA, 2017.
 15. [Janki Bhimani](#), Ningfang Mi, Miriam Leeser, and Zhengyu Yang, FiM: Performance Prediction Model for Parallel Computation in Iterative Data Processing Applications, IEEE International Conference on Cloud Computing (CLOUD'17), Honolulu, HI, 2017. Acceptance Rate: 18%.
 16. Han Gao, Zhengyu Yang, [Janki Bhimani](#), Teng Wang, Jiayin Wang, Ningfang Mi, and Bo Sheng, AutoPath: Harnessing Parallel Execution Paths for Efficient Resource Allocation in Multi-Stage Big Data Frameworks, International Conference on Computer Communications and Networks (ICCCN'17), Vancouver, Canada, 2017. Acceptance Rate: 25%.
 17. Qiumin Xu, Manu Awasthi, Krishna T. Malladi, [Janki Bhimani](#), Jingpei Yang, and Murali Annavaram. Performance analysis of containerized applications on local and remote storage International Conference on Massive Storage Systems and Technology (MSST17), Santa Clara, CA, 2017.
 18. [Janki Bhimani](#), Jingpei Yang, Zhengyu Yang, Ningfang Mi, Qiumin Xu, Manu Awasthi, Rajinikanth Pandurangan, and Vijay Balakrishnan, Understanding Performance of I/O Intensive Containerized Applications for NVMe SSDs, IEEE International Performance Computing and Communications Conference (IPCCC16), Las Vegas, NV, 2016. Acceptance Rate: 25.50%.
 19. Zhengyu Yang, Jianzhe Tai, [Janki Bhimani](#), Jiayin Wang, Ningfang Mi, and Bo Sheng, GREM: Dynamic SSD Resource Allocation in Virtualized Storage Systems with Heterogeneous VMs, IEEE International Performance Computing and Communications Conference (IPCCC16), Las Vegas, NV, 2016. Acceptance Rate: 25.50%.

Other Conference and Workshop Publications
Acceptance rates provided when known

20. Mahsa Bayati, Janki Bhimani, Ronald Lee, Ningfang Mi. Exploring Benefits of NVMe SSDs for BigData Processing in Enterprise Data Centers International Conference on Big Data Computing and Communication (BIGCOM19), Qingdao, China, 2019.
21. Janki Bhimani, Jingpei Yang, Zhengyu Yang, Ningfang Mi, NHV Krishna Giri, Rajinikanth Pandurangan, Changho Choi, and Vijay Balakrishnan. Enhancing SSDs with multi-stream: What? why? how? IEEE International Performance Computing and Communications Conference (IPCCC17), San Diego, CA, 2017. (Short Paper)
22. Janki Bhimani, Zhengyu Yang, Miriam Leeser, and Ningfang Mi, Accelerating Big Data Applications Using Lightweight Virtualization Framework on Enterprise Cloud, IEEE High Performance Extreme Computing Conference (HPEC17), Waltham, MA, 2017.
23. Qiumin Xu, Manu Awasthi, Krishna T. Malladi, Janki Bhimani, Jingpei Yang, Murali Annavaram, Docker Characterization on High Performance SSDs, IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS17), Santa Rosa, CA, 2017. (Short Paper)
24. Liu Chao, Janki Bhimani, and Miriam Leeser, Using High Level GPU Tasks to Explore Memory and Communications Options on Heterogeneous Platforms ACM Workshop on Software Engineering Methods for Parallel and High Performance Applications (SEM4HPC), Washington, D.C., 2017.
25. Liu Chao, Janki Bhimani, and Miriam Leeser, Exploring Memory Options for Data Transfer on Heterogeneous Platforms, The International ACM Symposium on High-Performance Parallel and Distributed Computing (HPDC17), Washington, D.C., 2017. (Short Paper)
26. Janki Bhimani, Miriam Leeser, and Ningfang Mi, Performance Prediction Techniques for Scalable Large Data Processing in Distributed MPI Systems, IEEE International Performance Computing and Communications Conference (IPCCC16), Las Vegas, NV, 2016. Acceptance Rate: 12%. (Short Paper)
27. Janki Bhimani, Miriam Leeser, and Ningfang Mi, Design Space Exploration of GPU Accelerated Cluster Systems for Optimal Data Transfer Using PCIe Bus, IEEE High Performance Extreme Computing Conference (HPEC16), Waltham, MA, 2016.
28. Janki Bhimani, Miriam Leeser, and Ningfang Mi, Accelerating K-Means Clustering with Parallel Implementations and GPU Computing, IEEE High Performance Extreme Computing Conference (HPEC15), Waltham, MA, 2015.

OTHER PUBLICATIONS

28. Baiyu Chen, Zhengyu Yang, Siyu Huang, Xianzhi Du, Zhiwei Cui, Janki Bhimani, Xin Xie, and Ningfang Mi, Cyber-Physical System Enabled Nearby Traffic Flow Modelling for Autonomous Vehicles, IEEE International Performance Computing and Communications Conference, Special Session on Cyber Physical Systems: Security, Computing, and Performance (IPCCC CPS17), San Diego, CA, 2017.
29. Xianfei Xia, Hongru Xiao, Zhengyu Yang, Xin Xie, and Janki Bhimani, "Pelletization Characteristics of the Hydrothermal Pretreated Rice Straw with Added Binders." Arabian Journal for Science and Engineering 43, no. 9 (2018): 4811-4820.

PRESENTED PAPERS, AND LECTURES

1. Guest Lecture: New Techniques for Data Management in Evolving Storage Technologies, Florida International University, Miami, FL, November 22, 2019.
2. Guest Lecture: New Storage Technologies for Big Data Processing on Cloud and Datacenter Infrastructures, Colorado State University, Fort Collins, CO, March 27, 2019.

3. Paper Presentation Talk: FIOS: Feature Based I/O Stream Identification for Improving Endurance of Multi-Stream SSDs, 2018 IEEE International Conference on Cloud Computing (CLOUD'18), San Francisco, CA, 2018.
4. Paper Presentation Talk: BloomStream: Data Temperature Identification for Flash Based Memory Storage Using Bloom Filters, 2018 IEEE International Conference on Cloud Computing (CLOUD'18), San Francisco, CA, 2018.
5. Paper Presentation Talk: FiM: Performance Prediction Model for Parallel Computation in Iterative Data Processing Applications, IEEE International Conference on Cloud Computing (CLOUD'17), Honolulu, HI, 2017.
6. Paper Presentation Talk: Understanding Performance of I/O Intensive Containerized Applications for NVMe SSDs, IEEE International Performance Computing and Communications Conference (IPCCC16), Las Vegas, NV, 2016.
7. Paper Presentation Talk: Accelerating Big Data Applications Using Lightweight Virtualization Framework on Enterprise Cloud, IEEE High Performance Extreme Computing Conference (HPEC17), Waltham, MA, 2017.
8. Paper Presentation Talk: Design Space Exploration of GPU Accelerated Cluster Systems for Optimal Data Transfer Using PCIe Bus, IEEE High Performance Extreme Computing Conference (HPEC16), Waltham, MA, 2016.
9. Paper Presentation Talk: Accelerating K-Means Clustering with Parallel Implementations and GPU Computing, IEEE High Performance Extreme Computing Conference (HPEC15), Waltham, MA, 2015.

CREATIVE WORK

1. SWOT analysis strategic planning technique used to improve the collective learning experience of the class.

PATENT DISCLOSURES, APPLICATIONS, AND AWARDS

1. Janki Bhimani, Jingpei Yang, Changho Choi, inventors; Samsung Electronics Co Ltd, assignee. Parallel key value based multi-thread machine learning exploiting KV-SSDs (Under Processing)
2. Janki Bhimani, Rajinikanth Pandurangan, Changho Choi, Vijay Balakrishnan, inventors; Samsung Electronics Co Ltd, assignee. System and method for identifying hot data and stream in a solid-state drive US 15/895797.
3. Janki Bhimani, Rajinikanth Pandurangan, Vijay Balakrishnan, Changho Choi, inventors; Samsung Electronics Co Ltd, assignee. Methods and systems for testing storage devices via a representative I/O generator United States patent application US 15/853419.
4. Janki Bhimani, Anand Subramanian, Vijay Balakrishnan, and Jingpei Yang, inventors; Samsung Electronics Co Ltd, assignee. Container workload scheduler and methods of scheduling container workloads United States patent application US15/820856.
5. Janki Bhimani, Jingpei Yang, Changho Choi, Jianjian Huo, inventors; Samsung Electronics Co Ltd, assignee. Smart I/O stream detection based on multiple attributes United States patent application US 15/344,422.
6. Janki Bhimani, Hingkwon Huen, Jingpei Yang, Manu Awasthi, Vijay Balakrishnan, Jason Martineau, inventors; Samsung Electronics Co Ltd, assignee. Intelligent controller for containerized applications United States patent application US 15/379,327.

TEACHING

1. Spring 2020: COP 3530: Data Structures
2. Fall 2019: CIS 5346: Storage Systems
3. Fall 2017: EECE 2560: Fundamentals of Engineering Algorithms

OTHER PROFESSIONAL ACTIVITIES AND PUBLIC SERVICE

FIU Internal Service

1. Service as a member of SCIS Graduate Committee 2019, 2020.
2. Service as a member of SCIS Tenure Track Faculty Hiring Committee 2020.

Service as Peer Reviewing

Conferences:

1. IEEE International Parallel & Distributed Processing Symposium (IPDPS)
2. IEEE International Conference on Cloud Computing (IEEE CLOUD)
3. IEEE High Performance Extreme Computing Conference (IEEE HPEC)
4. IEEE International Conference on Green Computing and Communications (GreenCom)
5. International Conference on Massive Storage Systems and Technology (MSST)
6. IEEE International Conference on Big Data (BigData)
7. International Conference on Networking, Architecture, and Storage (NAS)
8. International Conference on Parallel and Distributed Systems (ICPADS)
9. Workshop on Interactions of NVM/Flash with Operating Systems and Workloads (INFLOW)
10. International Conference on Performance Engineering (ICPE)
11. ACM/SIGDA International Symposium on Field-Programmable Gate Arrays (FPGA)
12. IEEE/IFIP International Conference on Dependable Systems and Networks (DNS)
13. Big Data and Cloud Performance Workshop at INFOCOM (DCPerf)
14. International Conference on Autonomic Computing (ICAC)
15. International Conference on Computer Aided Design (ICCAD)
16. International Conference on Cloud Computing Technologies and Applications (CloudTech)
17. Field-Programmable Custom Computing Machines (FCCM)
18. International Conference on Computer. Communication and Networks (ICCCN)
19. IEEE International Performance Computing and Communications Conference (IPCCC)
20. IEEE/ACM International Conference on Utility and Cloud Computing (UCC)

Journals:

1. Simulation Modelling Practice and Theory (SIMPAT), Elsevier Journal
2. Computers, MDPI Journal
3. Future Generation Computer Systems (FGCS), Elsevier Journal

4. Transactions on Computers (TC), IEEE Journal
5. ACM Transactions on Modeling and Performance Evaluation of Computing Systems (TOMPECS), ACM Journal

Community Services

1. Volunteering Affiliated Faculty, Center for Women and Gender Studies (CWGS), Florida International University, Miami FL, USA

Service as Invited Technical Program Committee Member

1. TPC for USENIX Conference on File and Storage Technologies (Usenix FAST) 2021
2. TPC for IEEE International Parallel & Distributed Processing Symposium (IPDPS) 2020
3. TPC for IEEE International Conference on Workload Characterization (IISWC) 2020
4. TPC for IEEE International Performance Computing and Communications Conference (IPCCC) 2019, 2020

PERSONAL TRAITS

Highly motivated and eager to learn new things.

Strong leadership skills and innovative approaches.

Ability to work as an individual as well as in group.

ACADEMIC SUPERVISION

Current Undergraduate Students

(Research Assistants/ Senior Project Advisees/ Capstone Project Advisees)

1. Natalia Valencia
2. Patrick Perez
3. Oscar Barbosa
4. Nazmul Huq
5. Luis Acosta
6. Ettore Mottola
7. Eitan Flor
8. Bryan Camacho

Current Ph.D. Students (Thesis Advisees)

1. Adnan Maruf
2. Manoj Pravakar Saha
3. Ashikee Ghosh