Adwait Jog

111N IST Building
Penn State University
University Park, PA, 16802
Homepage: http://adwaitjog.github.io

Email: adwait@cse.psu.edu
Alt. Email: adwaitjog@gmail.com
Skype ID: adwaitjog

RESEARCH INTERESTS

Computer Architecture, GPU-based Systems, Memory and Storage Systems, Emerging Memory Technologies

EDUCATION

The Pennsylvania State University, University Park *Fall 2009 - Present*
Ph.D. Candidate in Computer Science and Engineering
Advisors: Chita R. Das and Mahmut T. Kandemir
GPA: 3.84/4, Expected Graduation: Summer 2015

National Institute of Technology, Rourkela, India *Fall 2005 - Spring 2009*
Bachelor of Technology *(Hons.)* in Electronics and Instrumentation Engineering
GPA: 9.49/10, Among Top 5 students in the Institute.

PUBLICATIONS

[**ISCA 2015**] Nandita Vijaykumar, Gennady Pekhimenko, **Adwait Jog**, Abhishek Bhowmick, Rachata Ausavarungnirun, Onur Mutlu, Chita Das, Mahmut Kandemir, Todd Mowry, *A Case for Core-Assisted Bottleneck Acceleration in GPUs: Enabling Efficient Data Compression*, In 42^{nd} International Symposium on Computer Architecture (ISCA), Portland, OR, June, 2015

[**MICRO 2014**] Onur Kayiran, Nachiappan CN, **Adwait Jog**, Rachata Ausavarungnirun, Mahmut Kandemir, Gabriel Loh, Onur Mutlu, Chita Das, *Managing GPU Concurrency in Heterogeneous CPU-GPU Architectures*, In 47^{th} International Symposium on Micro Architecture (MICRO), Cambridge, UK, Dec 2014

[**GPGPU 2014**] **Adwait Jog**, Evgeny Bolotin, Zvika Guz, Mike Parker, Steve Keckler, Mahmut Kandemir, Chita Das, *Application-aware Memory System for Fair and Efficient Execution of Concurrent GPGPU Applications*, In General-Purpose Computation on Graphics Processing Unit (GPGPU-7), co-located with ASPLOS, Salt Lake City, UT, USA, March, 2014

[**PACT 2014**] Wei Ding, Mahmut Kandemir, Diana Guttman, **Adwait Jog**, Chita Das, Praveen Yedlapalli, *Trading Cache Hit Rate for Memory Performance*, In 23^{rd} International Conference on Parallel Architectures and Compilation Techniques (PACT), Edmonton, Canada, August, 2014

[**ASPLOS 2013**] **Adwait Jog**, Onur Kayiran, Nachiappan CN, Asit Mishra, Mahmut Kandemir, Onur Mutlu, Ravi Iyer, Chita Das, *OWL: Cooperative Thread Array Aware Scheduling Techniques for Improving GPGPU performance*, In 18^{th} International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), Houston, TX, USA, March, 2013

[**ISCA 2013**] **Adwait Jog**, Onur Kayiran, Asit Mishra, Mahmut Kandemir, Onur Mutlu, Ravi Iyer, Chita Das, *Orchestrated Scheduling and Prefetching for GPGPUs*, In 40^{th} International Symposium on Computer Architecture (ISCA), Tel Aviv, Israel, June, 2013

[**PACT 2013, Best Paper Nominee**] Onur Kayiran, **Adwait Jog**, Mahmut Kandemir, Chita Das, *Neither More Nor Less: Optimizing Thread-Level Parallelism for GPGPUs*, In 22^{nd} International Conference on Parallel Architectures and Compilation Techniques (PACT), Edinburgh, Scotland, September, 2013

[**DAC 2012**] **Adwait Jog**, Asit Mishra, Cong Xu, Yuan Xie, Vijaykrishnan Narayanan, Ravi Iyer, Chita Das, *Cache Revive: Architecting Volatile STT-RAM Caches for Enhanced Performance in CMPs*, In 49^{th} Design Automation Conference (DAC), San Francisco, USA, June 2012

AWARDS and HONORS

- Outstanding Graduate Research Assistant Award, CSE, Penn State, 2014
- NVIDIA Graduate Fellowship 2013, Finalist
- Best Paper Nomination, PACT 2013
- Student Travel Grants: ASPLOS 2014, ISCA 2013, ASPLOS 2013
- College of Engineering Fellowship, Penn State University, 2009
- Summer Research Fellowship, School of Computing, National University of Singapore, 2008
- Summer Research Fellowship, Indian Academy of Sciences, 2007
- Undergraduate Scholarship for being in Top 1% in All India Engineering Entrance Exam, 2005

PAPERS UNDER SUBMISSION

Adwait Jog, Onur Kayiran, Tuba Kesten, Ashutosh Pattnaik, Evgeny Bolotin, Nilardish Chatterjee, Steve Keckler, Mahmut Kandemir, Chita Das, *Anatomy of GPU Memory System for Multi-Application Execution.*

Adwait Jog, Onur Kayiran, Ashutosh Pattnaik, Mahmut Kandemir, Onur Mutlu, Ravi Iyer, Chita Das, *Exploiting Core-Criticality for Enhanced Performance in GPUs.*

Onur Kayiran, **Adwait Jog**, Ashutosh Pattnaik, Rachata Ausavarungnirun, Xulong Tang, Mahmut Kandemir, Gabriel Loh, Onur Mutlu, Chita Das, *Characterization and Identification of Data-path Underutilization for GPGPU Power Management.*

Narges Shahidi, Nima Elyasi, Mohammad Arjomand, Anand Sivasubramaniam, Mahmut T. Kandemir, **Adwait Jog**, Chita Das, *Storage Consolidation on SSDs.*

PATENTS

[**US Patent**] Evgeny Bolotin, Zvika Guz, **Adwait Jog**, Stephen W. Keckler, Mike Parker, *A US patent related to concurrent execution of multiple applications on GPUs is filed and currently pending (assigned to NVIDIA Corp.), 2014*

RESEARCH AND INDUSTRY EXPERIENCE

- **Graduate Research Assistant, Penn State** **Fall 2010 - Present**
  Advisor: Prof. Chita Das, High Performance Computing Lab (HPCL) **University Park, PA**
  - Proposed techniques for efficient execution of multiple applications on next generation GPUs.
  - Proposed criticality-aware memory system for GPUs.
  - Proposed a coordinated scheduling and prefetching mechanism to improve GPU performance.
  - Proposed warp scheduling policies to mitigate contention in GPU memory system.
  - Traded-off non-volatility of STT-RAM for lower write latency and energy.

- **NVIDIA Research, Graduate Research Intern** **Summer 2013**
  Manager: Steve Keckler **Santa Clara, CA**
  Mentors: Evgeny Bolotin, Zvika Guz, Mike Parker
  Researched on efficient execution of multiple contexts/applications on next generation GPUs. The results of this work are published in GPGPU 2014 (co-located with ASPLOS 2014). A related US patent is also filed and currently pending.

- **Intel Labs, Graduate Research Intern** **Summer 2012**
  Managers: Srihari Makineni, Ravi Iyer **Hillsboro, OR**
  Mentors: Xiaowei Jiang, Li Zhao
  Implemented and evaluated micro-architecture techniques for Intel's ultra-low power core (*Siskiyou*). This infrastructure is released to universities to perform research on energy-efficient architectures.

- **Intel Corp., Graduate Technical Intern** **Summer 2011**
  Manager: Sridhar Lakshmanmoorthy **Hillsboro, OR**
  Mentor: Ramadass Nagarajan
  Performed detailed studies and proposed techniques for designing a QoS aware interconnect fabric for the Intel's next generation heterogeneous SoCs.

TEACHING EXPERIENCE

- **Co-Instructor**, CMPEN 331, Computer Organization and Design **Fall 2014**
- **Co-Instructor**, CMPEN 331, Computer Organization and Design **Spring 2014**
- **Teaching Assistant**, CMPEN 431, Introduction to Computer Architecture **Spring 2010**
- **Teaching Assistant**, CMPEN 471, Logic Design of Digital Systems **Fall 2009**

TALKS AND POSTER SESSIONS

- Application-aware Memory System for Fair and Efficient Execution of Concurrent GPU Applications,
  – GPGPU-7 Workshop (co-located with ASPLOS 2014), Salt Lake City, UT, March 2014
  – Intern Talk, NVIDIA Research, Santa Clara, CA, Sept 2013
- Mitigating and Masking the Limitations of GPU Memory Systems,
  – Intern Talk, NVIDIA Research, Santa Clara, CA, June 2013
- Orchestrated Scheduling and Prefetching for GPGPUs,
  – ISCA 2013, Tel Aviv, Israel, June 2013
- OWL: Cooperative Thread Array Aware Scheduling Techniques for Improving GPGPU performance,
  – ASPLOS 2013, Houston, TX, March 2013
- Cache Revive: Architecting Volatile STT-RAM Caches for Enhanced Performance in CMPs,
  – DAC 2012, San Francisco, CA, June 2012
  – Poster presentation at IUCRC NEXYS Workshop, Pittsburgh, PA

SKILLS AND SOFTWARE

- C, Perl/Bash Scripting, GPGPU-Sim, M5, R, MATLAB, GDB

GRADUATE COURSEWORK

Operating System Design	Topics in Computer Architecture	Performance Evaluation
Algorithm Design & Analysis	Computer Networks	Computer Vision
VLSI Digital Circuit	Programming Language Concepts	Applied Statistics
Multiprocessor Architecture	Compiler Construction	Computer Hardware Design
Data Structures & Algorithms	Regression Methods	Bioinformatics

PROFESSIONAL SERVICE AND MEMBERSHIPS

- Proceedings and Submission Chair, ANCS 2015
- Reviewer (Conferences): I was on External Review Committee for DAC 2013, HPCA 2013, MICRO 2012, and ICCD (2014, 2013)
- On-Behalf Reviewer (Conferences): ASPLOS, ISCA, HPCA, MICRO, DATE, DAC, PACT, IPDPS
- Reviewer (Journals): IEEE Transactions on Computers (TC), ACM Transactions on Embedded Computing (TECS), ACM Transactions on Design Automation of Electronic Systems (TODAES), IEEE Journal on Computer Architecture Letters (CAL)
- Student Member of ACM, IEEE, ACM SIGARCH

LIST OF REFERENCES

Chita R. Das
Professor, Penn State University
Dept. of Computer Science & Engineering,
354F IST Building,
University Park, PA 16802
Phone: (814) 865-0194
Email: das@cse.psu.edu

Mahmut T. Kandemir
Professor, Penn State University
Dept. of Computer Science & Engineering,
354C IST Building,
University Park, PA 16802
Phone: (814) 863-4888
Email: kandemir@cse.psu.edu

Onur Mutlu
Associate Professor, Carnegie Mellon University
Dept. of Electrical and Computer Engineering,
Collaborative Innovation Center (CIC) Room 4105,
4720 Forbes Ave., Pittsburgh, PA 15213
Phone: (412) 268-1186
Email: onur@cmu.edu

Yuan Xie
Professor, University of California at Santa Barbara
Dept. of Electrical and Computer Engineering,
5159 Harold Frank Hall,
Santa Barbara, CA, 93106
Phone: (805) 893-5563
Email: yuanxie@ece.ucsb.edu

Ravishankar Iyer
Senior Principal Engineer
Intel Corporation
5200 NE Elam Young Pkwy
Mailstop HF1-61
Hillsboro, OR 97124
Email: ravishankar.iyer@intel.com

More references are available on request