

Mohamed Assem Ibrahim

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RESEARCH INTERESTS

My research interests lie in all aspects of computer architecture, including data-parallel architectures (e.g., GPUs), CPU-GPU heterogeneous architectures, and interconnection networks.

EDUCATION

- **William & Mary**, *Ph.D.* in Computer Science **Spring 2016 – Spring 2021**
Dissertation: Rethinking Cache Hierarchy and Interconnect Design for Next-generation GPUs
- **Cairo University**, *M.Sc.* in Computer Engineering **Fall 2010 – Fall 2015**
Thesis: On Enhancing the Performance of Bufferless Network-on-Chip
- **Cairo University**, *B.Sc.* in Computer Engineering **Fall 2005 – Spring 2010**

PROFESSIONAL EXPERIENCE

- **AMD Research**, *Postdoctoral Researcher*, Santa Clara, CA **Jan 2021 – Present**
- **William & Mary**, *Research Assistant*, Williamsburg, VA **Jan 2016 – Jan 2021**
Advisor: Assistant Professor Adwait Jog
My role was to conduct research related to large-scale GPU architectures.
- **AMD Research**, *Co-Op Engineer*, Remote **May 2020 – Dec 2020**
Mentors: Onur Kayiran, Shaizeen Aga
My role was to conduct research related to analyzing graphics workloads.
- **AMD Research**, *Co-Op Engineer*, Santa Clara, CA **May 2018 – Aug 2018**
Mentors: Onur Kayiran, Yasuko Eckert
My role was to conduct research related to large-scale GPU cache design. The results of this work are published in PACT 2020. It also resulted in filing three USPTO patent applications.
- **Cairo University**, *Research Assistant*, Giza, Egypt **Aug 2010 – Dec 2015**
Advisor: Professor Hatem El-Boghdadi
My role was to conduct research related to bufferless network-on-chip.
- **Nile University**, *Research Assistant*, Giza, Egypt **Jun 2012 – Jun 2013**
Advisor: Professor Tamer ElBatt
My role was to conduct research and create functional prototypes related to predictive loading of content on mobile phones based on user modeling. The results of this work are published in ICC 2014 and MobiSys 2013.
- **Inmobly**, *Software Engineer*, Giza, Egypt **Oct 2011 – Jun 2013**

PUBLICATIONS

- [**HPCA 2021**] Mohamed Assem Ibrahim, Onur Kayiran, Yasuko Eckert, Gabriel H. Loh, Adwait Jog, *Analyzing and Leveraging Decoupled L1 Caches in GPUs*, In the Proceedings of The 27th International Symposium on High-Performance Computer Architecture (HPCA), Virtual Event, February 2021
- [**PACT 2020**] Mohamed Assem Ibrahim, Onur Kayiran, Yasuko Eckert, Gabriel H. Loh, Adwait Jog, *Analyzing and Leveraging Shared L1 Caches in GPUs*, In the Proceedings of The 29th International Conference on Parallel Architectures and Compilation Techniques (PACT), Virtual Event, October 2020
- [**PACT 2019**] Mohamed Assem Ibrahim, Hongyuan Liu, Onur Kayiran, Adwait Jog, *Analyzing and Leveraging Remote-core Bandwidth for Enhanced Performance in GPUs*, In the Proceedings of The 28th International Conference on Parallel Architectures and Compilation Techniques (PACT), Seattle, Washington, September 2019

- [ICS 2019] Haonan Wang, Mohamed Assem Ibrahim, Sparsh Mittal, Adwait Jog, *Address-Stride Assisted Approximate Value Prediction in GPUs*, In the Proceedings of The 33rd ACM International Conference on Supercomputing (ICS), Phoenix, Arizona, June 2019
- [MICRO 2018] Hongyuan Liu, Mohamed Assem Ibrahim, Onur Kayiran, Sreepathi Pai, Adwait Jog, *Architectural Support for Efficient Large-Scale Automata Processing*, In the Proceedings of The 51st International Symposium on Microarchitecture (MICRO), Fukuoka, Japan, October 2018
- [HPCA 2018] Haonan Wang, Fan Luo, Mohamed Assem Ibrahim, Onur Kayiran, Adwait Jog, *Efficient and Fair Multi-programming in GPUs via Effective Bandwidth Management*, In the Proceedings of The 24th International Symposium on High-Performance Computer Architecture (HPCA), Vienna, Austria, February, 2018
- [HPCA 2017] Xulong Tang, Ashutosh Pattanaik, Huaipan Jiang, Onur Kayiran, Adwait Jog, Sreepathi Pai, Mohamed Assem Ibrahim, Mahmut Kandemir, Chita Das, *Controlled Kernel Launch for Dynamic Parallelism in GPUs*, In the Proceedings of The 23rd International Symposium on High-Performance Computer Architecture (HPCA), Austin, Texas, February, 2017
- [MES 2015] Mohamed Assem Ibrahim, Hatem M El-Boghdadi, *Investigating the Viability of Maximum Flexibility Selection Function in Bufferless 2D Meshes*, In the Proceedings of The 3rd International Workshop on Many-core Embedded Systems (MES), Portland, Oregon, June, 2015
- [ICC 2014] Omar Shoukry, Mohamed Assem Ibrahim, John Tadrous, Hesham El Gamal, Tamer ElBatt, Nayer Wanas, Yaser Elnakieb, and Mohamed Khairy *Proactive Scheduling for Content Prefetching in Mobile Networks*, In the Proceedings of IEEE International Conference on Communications (ICC), Sydney, Australia, June, 2014
- [MobiSys 2013] Mohamed Assem Ibrahim, Omar Shoukry, Hesham El Gamal, Tamer ElBatt, Nayer Wanas, Mohamed Abdel Raouf, Mohamed Zakaria, Ahmed Abdel Kader and Hakem Zayed *Demo: PAUL Proactive Automated mobile User centric content deLivery*, In the Proceedings of The 11th International Conference on Mobile Systems, Applications, and Services (MobiSys), Taipei, Taiwan, June, 2013

PATENTS

- [US10938709B2] Mohamed Assem Ibrahim, Onur Kayiran, Yasuko Eckert, Jieming Yin, *Mechanism for Dynamic Latency-Bandwidth Trade-off for Efficient Broadcasts/Multicasts*.

AWARDS, GRANTS, and HONORS

- Graduate Assistantship, William & Mary
- Student Travel Grant for attending: ISCA 2015, HPCA 2017, MICRO 2017, HPCA 2018, MICRO 2018, SIGMETRICS 2019, PACT 2019
- Graduate Assistantship, Cairo University
- Best Graduation Project (Software Engineering Category), Egyptian Engineering Day (EED), IEEE GOLD, 2010

REFERENCES

Available upon request.