

AHMED HASSAN

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Teaching Assistant Professor, CSE Department, Lehigh University
Mountaintop Building C 341, 113 Research Drive, Bethlehem, PA 18015

HIGHLIGHTS

Teaching: instructor of several undergraduate/graduate courses, in the Computer Science and Engineering departments of both Alexandria University (8 different courses) and Lehigh University (5 different courses).

Publications: 22 papers published in major conferences and journals of parallel and distributed computing (e.g., IEEE TC, IEEE TPDS, PPOPP, DISC, SPAA, IPDPS, ICDCS, PACT, OPODIS, SYSTOR). PC member and reviewer in major Journals and Conferences (e.g., IEEE TC, IEEE TPDS, SPAA, SRDS). Contributed to write 2 NSF proposals.

Advisement: Help in advisement of 5 PhD students and several undergraduate students at Lehigh University. Mentoring undergraduate students in the REU summer program. Main advisor of one Masters student and several graduation projects at Alexandria University.

RESEARCH INTERESTS

Faculty member in Lehigh's SSS (Scalable Systems and Software) research group. Research focuses on Concurrency and Synchronization, Concurrent and Transactional Data Structures, Multiprocessor Programming, Distributed Computing, Transactional Memory, and Operating and Distributed Systems.

EDUCATION

Virginia Tech, USA

August 2011 - September 2015

PhD Degree in Computer Engineering

Title: Designing, Modeling, and Optimizing Transactional Data Structures.

Advisor: Prof. Binoy Ravindran.

Alexandria University, Egypt

January 2007 - August 2011

Masters Degree in Computer Engineering.

Title: Adapting Ukkonen String Matching Algorithm for Biological Sequence Alignment Applications.

Alexandria University, Egypt

August 2001 - May 2006

Bachelor Degree in Computer Science.

Grade: distinction with degree of honor (GPA 4.0).

Graduation Project: Exploration and Map Building Using a Mobile Robot.

CURRENT POSITION

Lehigh University, Bethlehem, PA, USA

August 2020 - present

Teaching Assistant Professor (formerly named Professor of Practice)

- Computer Science and Engineering Department (Scalable Systems Software Research Group)

PAST POSITIONS

Lehigh University, Bethlehem, PA, USA

August 2019 - August 2020

Postdoctoral Research Associate and Adjunct Professor

- Computer Science and Engineering Department
- Postdoc Supervisors: Prof. Michael Spear and Prof. Roberto Palmieri

Alexandria University, Alexandria, Egypt

August 2016 - July 2019

Assistant Professor

- Computer and Systems Engineering Department

Virginia Tech, Blacksburg, VA, USA

September 2015 - June 2016

Postdoctoral Research Associate

- Bradley Department of Electrical and Computer Engineering
- Supervisor: Prof. Binoy Ravindran

Virginia Tech, Blacksburg, VA, USA

September 2014 - August 2015

Research Assistant

- Bradley Department of Electrical and Computer Engineering
- Supervisor: Prof. Binoy Ravindran

Alexandria University, Alexandria, Egypt

January 2007 - August 2011

Teaching Assistant

- Computer and Systems Engineering Department

JOURNAL AND CONFERENCE PUBLICATIONS

1. Jacob Nelson, Ahmed Hassan, and Roberto Palmieri
“Bundling Linked Data Structures for Linearizable Range Queries”,
27th ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP),
April 2-6, 2022, virtual event.
2. Matthew Rodriguiz, Ahmed Hassan, and Michael Spear
“Exploiting Locality in Scalable Ordered Maps”,
41st IEEE International Conference on Distributed Computing Systems (ICDCS), July 7-10, 2021,
virtual event.
3. dePaul Miller, Jacob Nelson, Ahmed Hassan, and Roberto Palmieri
“KVCG: a heterogeneous key-value store for skewed workloads”,
14th ACM International Systems and Storage Conference (SYSTOR), June 14-16, 2021, virtual
event.
4. Yaodong Sheng, Ahmed Hassan, and Michael Spear
“Semantic Conflict Detection for Transactional Data Structure Libraries”,
33rd ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), Brief Announce-
ment, July 6-8, 2021, virtual event.
5. Jacob Nelson, Ahmed Hassan, and Roberto Palmieri
“POSTER: Bundled References: An Abstraction for Highly-Concurrent Linearizable Range Queries”,
26th ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP),
Feb 27- March 3, 2021, virtual event.

6. Kevin Williams, Joe Foster, Athicha Srivirote, Ahmed Hassan, Joseph Tassarotti, Lewis Tseng, and Roberto Palmieri
“On Building Modular and Elastic Data Structures with Bulk Operations”
22nd International Conference on Distributed Computing and Networking (ICDCN), Poster paper, January 5-8, 2021, virtual event.
7. Matthew Rodriguiz, Ahmed Hassan, and Michael Spear
“Exploiting Locality in Scalable Ordered Maps”,
29th ACM International Conference on Parallel Architectures and Compilation Techniques (PACT), Poster paper, October 5-7, 2020, virtual event.
8. Magdy AbdelNaby, Mohamed Khalefa, Yousry Taha, and Ahmed Hassan
“Towards efficient top-k fuzzy auto-completion queries”
Alexandria Engineering Journal, 2020
9. Zhanhao Chen, Ahmed Hassan, Masoomeh Javidi Kishi, Jacob Nelson and Roberto Palmieri
“HaTS: Hardware-assisted Transaction Scheduler”
23rd International Conference on Principles of Distributed Systems (OPODIS), Springer LNCS, December 17-19, 2019, Neuchâtel, Switzerland.
10. Masoomeh Javidi Kishi, Ahmed Hassan and Roberto Palmieri
“Brief Announcement: On the Correctness of Transaction Processing with External Dependency”
33rd International Symposium on Distributed Computing (DISC), LNCS Springer, October 14-18, 2019, Budapest, Hungary.
11. Henry Daly, Ahmed Hassan, Michael Spear, and Roberto Palmieri
“NUMASK: High Performance Scalable Skip List for NUMA”
32nd International Symposium on Distributed Computing (DISC), October 15-19, 2018, New Orleans, Louisiana, USA.
12. Mohamed Mohamedin, Sebastiano Peluso, Masoomeh Javidi Kishi, Ahmed Hassan, and Roberto Palmieri
“Nemo: NUMA-aware Concurrency Control for Scalable Transactional Memory”
47th International Conference on Parallel Processing (ICPP), August 13-16, 2018, Eugene, Oregon, USA.
13. Ahmed Hassan, Sebastiano Peluso, Roberto Palmieri, and Binoy Ravindran
“Optimistic Transactional Boosting”
IEEE Transactions on Parallel and Distributed Systems, 2017.
14. Mohamed Mohamedin, Roberto Palmieri, Ahmed Hassan and Binoy Ravindran
“Managing Resource Limitation of Best-Effort HTM”
IEEE Transactions on Parallel and Distributed Systems, 2017.
15. Sandeep Hans, Ahmed Hassan, Roberto Palmieri, Sebastiano Peluso, and Binoy Ravindran
“Opacity vs TMS2: expectations and reality”
30th International Symposium on Distributed Computing (DISC), LNCS Springer, September 26-29, 2016, Paris, France.
16. Mohamed M. Saad, Roberto Palmieri, Ahmed Hassan, and Binoy Ravindran
“Extending TM Primitives using Low Level Semantics”
28th ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), ACM, July 11-13 2016, Asilomar State Beach, California, USA.
17. Ahmed Hassan, Roberto Palmieri, Binoy Ravindran
“Remote transaction commit: Centralizing software transactional memory commits”
IEEE Transactions on Computers, 2016.

18. Ahmed Hassan, Roberto Palmieri, Binoy Ravindran
 “Transactional Interference-less Balanced Tree”
29th International Symposium on Distributed Computing (DISC), LNCS Springer, October 5-9, 2015, Tokyo, Japan.
19. Mohamed Mohamedin, Roberto Palmieri, Ahmed Hassan and Binoy Ravindran
 “Brief Announcement: Managing Resource Limitation of Best-Effort HTM”
27th ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), ACM, June 13-15 2015, Portland, Oregon, USA.
20. Ahmed Hassan, Roberto Palmieri and Binoy Ravindran “On Developing Optimistic Transactional Lazy Set”
18th International Conference on Principles of Distributed Systems (OPODIS), Springer LNCS, December 15-19, 2014, Cortina, Italy.
21. Ahmed Hassan, Roberto Palmieri and Binoy Ravindran
 “Remote Invalidation: Optimizing the Critical Path of Memory Transactions”
28th IEEE International Symposium on Parallel and Distributed Processing (IPDPS), IEEE, May 19-23, 2014, Phoenix, Arizona, USA.
22. Ahmed Hassan, Roberto Palmieri and Binoy Ravindran
 “Optimistic Transactional Boosting”
ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP), Poster paper, ACM, February 15-19, 2014, Orlando, Florida, USA.

WORKSHOP PUBLICATIONS

1. Ahmed Hassan, Sebastiano Peluso, Roberto Palmieri and Binoy Ravindran
 “On the Correctness of Optimistic Composable Data Structures”
7th Workshop on the Theory of Transactional Memory (WTTM), July 20, 2015, Donostia-San Sebastián, Spain.
2. Ahmed Hassan, Roberto Palmieri and Binoy Ravindran
 “Transactional Interference-less Balanced Tree”
10th ACM SIGPLAN Workshop on Transactional Computing (TRANSACT), June 15-16 2015, Portland, Oregon, USA.
3. Ahmed Hassan, Roberto Palmieri and Binoy Ravindran
 “Integrating Transactionally Boosted Data Structures with STM Frameworks: A Case Study on Set”
9th Workshop on Transactional Computing (TRANSACT), Online archive, March 2, 2014, Utah, USA.

TEACHING EXPERIENCE

Lehigh University

- CSE 140: Foundations of Discrete Structures and Algorithms (Spring 2020, Spring 2021, Summer 2021, Fall 2021)
- CSE 411: Advanced Programming Techniques (Fall 2019, Fall 2020, Fall 2021)
- CSE 303: Operating Systems (Fall 2021)
- CSE 440: Advanced Algorithms (Spring 2021)
- CSE 340: Design and Analysis of Algorithms (Fall 2020)

Alexandria University

- CC491: Multiprocessor Programming (Spring 2019)

- CC552: Net-Centric Computing and Distributed Systems (Spring 2018, Fall 2018, Spring 2019)
- CC373: Operating Systems (Spring 2017, Fall 2017)
- CC371: Analysis and Design of Algorithms (Fall 2016)
- CC451: Computer Networks (Fall 2016, Spring 2019)
- GPE435: Operations Research (Spring 2017)
- CC272: Programming II (Spring 2017)
- CSE102: Computer Programming (Fall 2016, Fall 2017, Fall 2018)

Alexandria University (Teaching Assistant)

- Assisted in teaching the following courses: Introduction to Programming, Data Structures, Discrete Mathematics, Computer Organization, Information Systems, File Structures, and Database Systems.

STUDENT ADVISEMENT AT LEHIGH UNIVERSITY

Current (not main advisor)

- **Jacob Nelson, PhD.** (co-authors in three papers, member of his general exam committee) Main advisor: Prof. Roberto Palmieri.
- **DePaul Miller, PhD.** (co-authors in one paper, member of his qualifier exam committee) Main advisor: Prof. Roberto Palmieri.
- **Matthew Rodriguez, PhD.** (co-authors in one paper) Main advisor: Prof. Michael Spear.
- **Yaodong Sheng, PhD.** (co-authors in one paper) Main advisor: Prof. Michael Spear.
- **Kevin Williams, BSc.** (co-authors in one paper) Main advisor: Prof. Roberto Palmieri.

Alumni

- **Masoomeh Javidi Kishi, PhD.** (co-authors in two papers) Main advisor: Prof. Roberto Palmieri.
- **Luke Bernik, BSc.** Main advisor: Prof. Roberto Palmieri.
- **Thomas Salemy, BSc.** Main advisor: Prof. Roberto Palmieri.
- **Isslam Yahia, BSc.** REU program mentor, Summer 2021.
- **Kevin Williams, BSc.** REU program co-mentor, Summer 2020. (co-authors in one paper)
- **Joe Foster, BSc.** REU program co-mentor, Summer 2020. (co-authors in one paper)

STUDENT ADVISEMENT AT ALEXANDRIA UNIVERSITY

Assistant Professor - main advisor

Magdy Abdelnaby, MSc. graduated Fall 2020.

- Several graduation projects (spanning three academic years 2016-2019)

REVIEWING ACTIVITIES

Journals:

1. IEEE Transaction on Parallel and Distributed Systems (IEEE TPDS) (reviewer);
2. IEEE Transaction on Computers (IEEE TC) (reviewer);
3. Future Generation Computer Systems (FGCS) (reviewer);
4. Alexandria Engineering Journal (AEJ) (reviewer);

International Conferences:

- Committee member
 1. International Conference on Principles of Distributed Systems (OPODIS 2022) (PC member);
 2. International Symposium on Reliable Distributed Systems (SRDS 2021) (PC member);
 3. Workshop on Principles and Practice of Consistency for Distributed Data (PaPoC 2021 - co-located with EuroSys 2021) (PC member);
 4. ACM Symposium on Parallelism in Algorithms and Architectures (SPAA 2020) (PC member);
 5. IEEE Global Conference on Internet of Things (IEEE GCIoT 2018) (technical committee member)
- Reviewer/Sub-reviewer
 1. ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP 2022) (sub-reviewer)
 2. USENIX Annual Technical Conference (ATC 2021) (sub-reviewer);
 3. The European Conference on Computer Systems (EuroSys 2020) (sub-reviewer)
 4. USENIX Annual Technical Conference (ATC 2020) (sub-reviewer);
 5. IEEE World Forum on Internet of Things (WF-IoT 2020) (reviewer);
 6. International Symposium on Distributed Computing (DISC 2019) (sub-reviewer);
 7. IEEE Global Conference on Internet of Things (IEEE GCIoT 2019) (reviewer)
 8. International Conference on Principles of Distributed Systems (OPODIS 2019) (sub-reviewer);
 9. IEEE International Symposium on Network Computing and Applications (IEEE NCA 2019) (sub-reviewer);
 10. International Symposium on Distributed Computing (DISC 2018) (sub-reviewer);
 11. ACM Symposium on Principles of Distributed Computing (PODC 2017) (sub-reviewer);
 12. ACM Symposium on Parallelism in Algorithms and Architectures (SPAA 2017) (sub-reviewer);
 13. International Conference on Principles of Distributed Systems (OPODIS 2016) (sub-reviewer);
 14. ACS/IEEE International Conference on Computer Systems and Applications (AICCSA 2016) (sub-reviewer);
 15. ACM/IFIP/USENIX Middleware (Middleware 2015) (sub-reviewer);
 16. IEEE International Parallel and Distributed Processing Symposium (IPDPS 2015) (sub-reviewer);
 17. International Green and Sustainable Computing Conference (IGSC 2015) (sub-reviewer);

REWARDS AND ACADEMIC ACTIVITIES

- Mentorship Appreciation Award**, Lehigh University. *2020*
<https://wordpress.lehigh.edu/gradmentorshipappreciation2020/team/ahmed-hassan/>
- Judge**, Intel Bibliotheca Alexandrina Science and Engineering Fair (Intel BASEF). *2017-2019*
- Instructor**, IoT Summer training, Big Data Analysis track, Alexandria University. *2017*
- PhD Full Scholarship**, VT-MENA program, the Egyptian Ministry of Higher Education. *2011-2015*
- Guest Lecturer**, CS/ECE-5510 (Multiprocessor Programming), ECE-3574 (Applied Software Design), and ECE-4574/5574 (Large/Advanced Software Development), Virginia Tech. *2014-2016*
- Coach**, two teams in ACM-ICPC Arab Collegiate Programming Contest, Alexandria University. Achieved 3rd and 15th places. First team qualified to the World Finals. *2010*
- Instructor**, Algorithms and Problem-Solving summer training, Alexandria University. *2010*
- Invited Speaker**, IEEE ITW conference, Bibliotheca Alexandrina. *2010*
- 6th rank**, BSc class (85 students), Alexandria University. *2006*
- ACM students chapter member**, Alexandria University. *2004-2005*