Khaled Abdelaal

484-456-6967 | khaled.abdelaal@ou.edu | linkedin | github

Education

The University of Oklahoma — Norman, OK
PhD in Computer Science — *2020 – Present*

Lehigh University — Bethlehem, PA
Master of Science in Computer Engineering, GPA 3.73 /4.00 — *2018 – 2020*

Mansoura University — Mansoura, Egypt
Master of Science in Automatic Control Systems Engineering — *2014 – 2017*

Mansoura University — Mansoura, Egypt
Bachelor of Science in Computers and Systems Engineering, GPA 90.24%, Ranked 2 / 109 — *2008 – 2013*

Experience

Graduate Research Assistant — Aug. 2020 – Present
The University of Oklahoma — *Norman, OK*

- Working on High Performance and Scientific Computing Performance Optimization
- Novel high-performance automatic sparse matrix kernel generation

Assistant Lecturer — Dec. 2013 – Present (on leave)
Mansoura University — *Mansoura, Egypt*

- Teaching Computer Engineering undergraduate level courses
- Courses include: CSE3214 Programming Languages 2, CSE3223 Programming Languages 3, CSE3412 Network Design Programming, CSE3422 Distributed Computer Systems and Web Development (Summer training).

Graduate Teaching Assistant — Aug. 2019 – Jan 2020
Lehigh University — *Bethlehem, PA*

- Full teaching assistant for ECE033: Introduction to Computer Engineering
- Responsible for conducting recitations, grading weekly homework and office hours

Graduate Research Assistant — Jan. 2018 – Aug. 2019
Lehigh University — *Bethlehem, PA*

- Conducting research in computer architecture, especially emerging memory systems
- Supporting Phase-Change Memory with lightweight error detection techniques
- Involved in Intel's CAPA program

Part-time Systems Engineer — Nov. 2015 – Apr. 2017
Microdoers LLC — *Cairo, Egypt*

- Microsoft Servers Infrastructure Design and Implementation (Azure)
- Python software development
- Hybrid Mobile App development (AngularJS and ionic)
- ERP systems customization (odoo)
- Technical Writing

Publications

- Chao Zhang, ***Khaled Abdelaal***, Angel Chen, Xinhui Zhao, Wujie Wen, and Xiaochen Guo, **"ECC Cache: A Lightweight Error Detection for Phase-Change Memory Stuck-At Faults,"** to appear in Proceedings of the 39th IEEE/ACM International Conference on Computer-Aided Design (ICCAD), Virtual Conference, November 2020.
- ***Khaled M. Attia***, Mostafa A. El-Hosseini, Hesham A. Ali, **Dynamic power management techniques in multi-core architectures: A survey study**, Ain Shams Engineering Journal, Volume 8, Issue 3, 2017, Pages 445-456, ISSN 2090-4479, https://doi.org/10.1016/j.asej.2015.08.010.

Projects

A Multi-threaded Hybrid Randomized Quick-Merge Sort Algorithm | *Java* Fall 2019

- Implementation of a hybrid sorting algorithm, that incorporates both randomized quick sort and the merge subroutine from the merge sort
- Algorithms is also multithreaded to maximize speedup by independlty sorting splits of the original input data and merging them (when the input size is large). Otherwise, we stick to the original, sequential implementation of the quicksort.
- Source Code(github)

A Concurrent CuckooHash Implementation | *C++* Fall 2019

- A Concurrent Implementation of the fast CukooHashing Algorithm using C++
- Source Code (github)

Parallel K-Means Implementation using x86 SIMD instructions | *C++* Fall 2019

- Using x86 SIMD vector instructions to implement a parallel version of the K-Means clustering Algorithm
- Improving K-Means performance using multiple memory optimizations to exploit cache locality and reduce memory traffic
- Achieved up to 8× speedup for some datasets
- Source Code (github)

RHT: A Replicated Distributed Hashtable Implementation | *Java* Spring 2018

- An implementation of a distributed hashtable, where parts of the table are stored on different nodes
- Replication is also implemented to ensure availability
- Source Code(github)

TRANS Graph: a real-time order verification tool for transaction traces | *Python* Spring 2018

- A simple tool to verify a transaction trace does not violate real-time order
- Takes a transaction trace as input and produces a dependency graph and checks for real-time order violations.
- Source Code(github)

Anime recommendation web-based interface | *Python, R, HTML, CSS, Javascript, Django* Fall 2020

- Implementation of an web-based interface to recommend anime shows
- Recommendation is based on the clustering of historical data of many attributes including user profile (gender, age), demographic information in addition to shows genres
- Implementation of clustering algorithms (K-Means, DBSCAN), front-end, and backend
- Data pre-processing in R
- Source Code(github)

Evaluation of Classification Techniques using SciKitLearn | *Python* Fall 2019

- Evaluation of Logistic Regression, KNN, SVM, Decision Trees, Random Forests, and Multi-percepton Neural Networks classification algorithms in scikitlearn
- Source Code and Evaluation Report (github)

A Web-based Student Management System | *HTML, CSS, Bootstrap, Javascript, PHP, MySQL* Fall 2015

- A full web-based system (backend and frontend) for manging students information and classes
- Seperate interface for students and instructor/system-admin
- Ability to capture student personal info, class info, attendance, staff info and permissions, etc

Implementation of a 5-stage RISC CPU | *Verilog* Spring 2018

- Implementation of a full 5-stage RISC CPU using Verilog

Object Detection using OpenCV | *C++* Fall 2014

- Implementation of an object detection system using OpenCV
- Object features are pre-stored in a DB and then compared to camera feed to perform detection

PCB Design of an 8-Layer Educational Tablet board | *Altium Designer* Fall 2013

- The Design and customization of an 8-layer printed circuit board for an educational tablet
- Board included an ARM Cortex A7 processor and DDR3 interface

Technical Skills

Languages: C/C++, Java, Python, bash, C#, JavaScript, PHP, R, MySQL
Computer Architecture Research: gem5, McPAT, x86
Systems Development: x86 SIMD, OpenMP, Socket Programming, Concurrent Programming

Awards

- The University of Oklahoma Gallogly College of Engineering PhD Recruitment Excellence Fellowship (Academic Year 2020-2021)
- Mansoura University Best Engineering Graduation Project Award (Academic Year 2012-2013)
- Second Award in Mansoura Unviersity First Scientific Conference 2013
- Graduated with Honors in 2013 from Computers and Systems Engineering Departement, Mansoura, Egypt