MOHAMMED ALFARHAN

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Education

King Abdullah University of Science and Technology, Saudi Arabia — Aug 2014 – May 2019
Ph.D., Computer Science. Advisor: David E. Keyes
Dissertation – Unstructured Computations on Emerging Architectures

King Abdullah University of Science and Technology, Saudi Arabia — Aug 2012 – Dec 2013
M.Sc., Computer Science

King Faisal University, Saudi Arabia — Aug 2007 – Feb 2012
B.Sc., Computer Science

Experience

University of Tennessee, Knoxville, US. Postdoctoral Research Associate — Jun 2019 - Present
Director: Jack Dongarra
Research on developing numerical software libraries for solving linear algebra problems at scale

ROBOCROP, Saudi Arabia. Software Consultant [Part Time] — Sep 2017 - Mar 2019
Worked as a robotics software engineer and full stack developer for a robotics solutions startup

Saudi Electricity Company, Saudi Arabia. Software Engineer — May 2012 - Aug 2012
Developed a distributed system to monitor and detect anomalies in the reading meters

Saudi Aramco, Saudi Arabia. Software Engineer Intern — Summer 2011
Developed a distributed key-value store system to monitor IT incidents and infrastructure change requests

Saudi Aramco, Saudi Arabia. Software Engineer Intern — Summer 2010
Developed a database system to collect and log reports on IT problems for further processing with ease

Research

1. *MAGMA Templates for Scalable Linear Algebra on Emerging Architectures*
   Mohammed A. Al Farhan, Ahmad Abdelfattah, Stanimire Tomov, Mark Gates, Dalal Sukkari, Azzam Haidar, Robert Rosenberg, and Jack Dongarra
   The International Journal of High Performance Computing Applications, 2019 (under review)
   `https://icl.utk.edu/magma/`
2. *Extreme Scale FMM-accelerated Boundary Integral Equation Solver for Wave Scattering*
   Mustafa Abduljabbar, **Mohammed A. Al Farhan**, Noha Al-Harthi, Rui Chen, Rio Yokota, Hakan Bagci, and David E. Keyes
   SIAM Journal on Scientific Computing (SISC), 2019
   `https://ecrc.github.io/BEMFMM/`
3. *Optimizations of Unstructured Aerodynamics Computations for Many-core Architectures*
   Mohammed A. Al Farhan and David E. Keyes
   IEEE Transactions on Parallel and Distributed Systems (TPDS), 2018
4. *Performance Evaluation of Computation and Communication Kernels of the Fast Multipole Method on Intel Manycore Architecture*
   Mustafa Abduljabbar, **Mohammed A. Al Farhan**, Rio Yokota, and David E. Keyes
   International European Conference on Parallel and Distributed Computing (Euro-Par), 2017
5. *Unstructured Computational Aerodynamics on Many Integrated Core Architecture*
   Mohammed A. Al Farhan, Dinesh K. Kaushik, and David E. Keyes
   Elsevier Parallel Computing Journal (PARCO), 2016
6. *An Algorithm for Reduct Cardinality Minimization*
   Hassan AbouEisha, **Mohammed A. Al Farhan**, Igor Chikalov, and Mikhail Moshkov
   IEEE International Conference on Granular Computing (GrC), 2013
   `https://farhanma.github.io/reduct/`

Services Served as a peer reviewer for the *IEEE Cluster 2016,, PLOS One 2018, International Journal of High Performance Computing Applications (IJHPCA) 2018, IEEE International Parallel & Distributed Processing Symposium (IPDSPS) 2019, ACM Transactions on Parallel Computing (TOPC) 2019, Elsevier Parallel Computing (PARCO) 2019*

Teaching **AMCS 312: High Performance Computing.** Teaching Assistant (TA) for David E. Keyes

- King Abdullah University of Science and Technology, Saudi Arabia
  - Fall 2014, Fall 2015, Fall 2016, Fall 2017, and Fall 2018
- Saudi Aramco, Saudi Arabia
  - Fall 2018
- Blue Waters Online Courses
  - Fall 2016 [Introduction to High Performance Computing]
- KAUST Visualization and Supercomputing Summer School, Saudi Arabia
  - Summer 2016 [Introduction to Portable, Extensible Toolkit for Scientific Computation (PETSc)]

Talks Slides available at `https://speakerdeck.com/farhanma`

1. *Unstructured Computations on Emerging Architectures*
   (a) SIAM Conference on Computational Science and Engineering, 2019. Spokane, Washington, USA
2. *BEMFMM: An Extreme Scale FMM-Accelerated BIE Solver for Wave Scattering*
   (a) SIAM Conference on Computational Science and Engineering, 2019. Spokane, Washington, USA
   (b) Intel eXtreme Computing User Group (IXPUG) Meeting, 2018. KAUST, KSA
   (c) SIAM Conference on Parallel Processing for Scientific Computing, 2018. Tokyo, Japan
3. *Optimizations of Unstructured Aerodynamics Computations for Intel Knights Landing Architecture*
   (a) Intel eXtreme Computing User Group (IXPUG) Meeting, 2018. KAUST, KSA
   (b) SIAM Conference on Parallel Processing for Scientific Computing, 2018. Tokyo, Japan
   (c) Intel HPC Developer Conference, 2017. Denver, Colorado, USA
   (d) Fully Predictive Complex Computational Fluid Dynamics Workshop, 2017. KAUST, KSA
   (e) High Performance Computing Saudi Arabia (HPC Saudi) Conference, 2017. KAUST, KSA *Received best poster award*
   (f) SIAM Conference on Computational Science and Engineering, 2017. Atlanta, Georgia, USA
   (g) Scalable Hierarchical Algorithms for eXtreme Computing Workshop, 2017. KAUST, KSA
4. *Performance Evaluation of Fast Multipole Method on Intel Manycore Architecture*
   (a) International European Conference on Parallel and Distributed Computing (Euro-Par), 2017
   (b) HPC in Asia Poster Competition, International Supercomputing Conference (ISC), 2017
5. *Implicit Unstructured Computational Aerodynamics on Many-Integrated Core Architecture*
   (a) International Conference on Parallel Computational Fluid Dynamics, 2014. Trondheim, Norway
   (b) Scalable Hierarchical Algorithms for eXtreme Computing workshop, 2014. KAUST, KSA

Programming Languages – C/C++, Python, Java, Unix Shell, MATLAB, LaTeX
Models – Intel Intrinsics, MPI, OpenMP, pThreads, CUDA
Tools – Make, CMake, GNU Autotools, perf tools, Valgrind, GNU Debugger, Tracing, gnuplot, Git