MOHAMMED ALFARHAN

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Postdoctoral Research Associate, Innovative Computing Laboratory
University of Tennessee, Knoxville

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 distributed systems 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, and ACM Transactions on Parallel Computing (TOPC) 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, Shell Script, MATLAB, and LaTeX
                           MODELS – x86 Compiler Intrinsics, OpenMP, pThreads, TBB, CUDA, and MPI
                           TOOLS – Make, CMake, gmake, Autotools, perf tools, Valgrind, gnuplot, Git, and Mercurial