

# MOHAMMED ALFARHAN

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

farhan@icl.utk.edu  
(+966) (0) 55-616-8331  
farhanma.github.io  
github.com/farhanma  
bitbucket.org/farhanma

Education	<b>King Abdullah University of Science and Technology</b> , Saudi Arabia Ph.D., Computer Science. Advisor: David E. Keyes DISSERTATION – Unstructured Computations on Emerging Architectures	Aug 2014 – May 2019
	<b>King Abdullah University of Science and Technology</b> , Saudi Arabia M.Sc., Computer Science	Aug 2012 – Dec 2013
	<b>King Faisal University</b> , Saudi Arabia B.Sc., Computer Science	Aug 2007 – Feb 2012
Experience	<b>University of Tennessee</b> , Knoxville, US. Postdoctoral Research Associate Director: Jack Dongarra Research on developing numerical software libraries for solving linear algebra problems at scale	Jun 2019 - Present
	<b>ROBOCROP</b> , Saudi Arabia. Software Consultant [Part Time] Worked as a robotics software engineer and full stack developer for a robotics solutions startup	Sep 2017 - Mar 2019
	<b>Saudi Electricity Company</b> , Saudi Arabia. Software Engineer Developed a distributed system to monitor and detect anomalies in the reading meters	May 2012 - Aug 2012
	<b>Saudi Aramco</b> , Saudi Arabia. Software Engineer Intern Developed a distributed key-value store system to monitor IT incidents and infrastructure change requests	Summer 2011
	<b>Saudi Aramco</b> , Saudi Arabia. Software Engineer Intern Developed a database system to collect and log reports on IT problems for further processing with ease	Summer 2010
Research	<ol style="list-style-type: none"><li><i>MAGMA Templates for Scalable Linear Algebra on Emerging Architectures</i> <b>Mohammed A. Al Farhan</b>, 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) <a href="https://icl.utk.edu/magma/">https://icl.utk.edu/magma/</a></li><li><i>Extreme Scale FMM-accelerated Boundary Integral Equation Solver for Wave Scattering</i> Mustafa Abduljabbar, <b>Mohammed A. Al Farhan</b>, Noha Al-Harthi, Rui Chen, Rio Yokota, Hakan Bagci, and David E. Keyes SIAM Journal on Scientific Computing (SISC), 2019 <a href="https://ecrc.github.io/BEMFMM/">https://ecrc.github.io/BEMFMM/</a></li><li><i>Optimizations of Unstructured Aerodynamics Computations for Many-core Architectures</i> <b>Mohammed A. Al Farhan</b> and David E. Keyes IEEE Transactions on Parallel and Distributed Systems (TPDS), 2018</li><li><i>Performance Evaluation of Computation and Communication Kernels of the Fast Multipole Method on Intel Manycore Architecture</i> Mustafa Abduljabbar, <b>Mohammed A. Al Farhan</b>, Rio Yokota, and David E. Keyes International European Conference on Parallel and Distributed Computing (Euro-Par), 2017</li><li><i>Unstructured Computational Aerodynamics on Many Integrated Core Architecture</i> <b>Mohammed A. Al Farhan</b>, Dinesh K. Kaushik, and David E. Keyes Elsevier Parallel Computing Journal (PARCO), 2016</li><li><i>An Algorithm for Reduct Cardinality Minimization</i> Hassan AbouEisha, <b>Mohammed A. Al Farhan</b>, Igor Chikalov, and Mikhail Moshkov IEEE International Conference on Granular Computing (GrC), 2013 <a href="https://farhanma.github.io/reduct/">https://farhanma.github.io/reduct/</a></li></ol>	

<b>Services</b>	Served as a peer reviewer for the <i>IEEE Cluster 2016</i> , <i>PLOS One 2018</i> , <i>International Journal of High Performance Computing Applications (IJHPCA) 2018</i> , <i>IEEE International Parallel &amp; Distributed Processing Symposium (IPDPS) 2019</i> , <i>ACM Transactions on Parallel Computing (TOPC) 2019</i> , <i>Elsevier Parallel Computing (PARCO) 2019</i>
<b>Teaching</b>	<p><b>AMCS 312: High Performance Computing.</b> Teaching Assistant (TA) for David E. Keyes</p> <ul style="list-style-type: none"> <li>• King Abdullah University of Science and Technology, Saudi Arabia <ul style="list-style-type: none"> <li>– Fall 2014, Fall 2015, Fall 2016, Fall 2017, and Fall 2018</li> </ul> </li> <li>• Saudi Aramco, Saudi Arabia <ul style="list-style-type: none"> <li>– Fall 2018</li> </ul> </li> <li>• Blue Waters Online Courses <ul style="list-style-type: none"> <li>– Fall 2016 [Introduction to High Performance Computing]</li> </ul> </li> <li>• KAUST Visualization and Supercomputing Summer School, Saudi Arabia <ul style="list-style-type: none"> <li>– Summer 2016 [Introduction to Portable, Extensible Toolkit for Scientific Computation (PETSc)]</li> </ul> </li> </ul>
<b>Talks</b>	<p>Slides available at <a href="https://speakerdeck.com/farhanma">https://speakerdeck.com/farhanma</a></p> <ol style="list-style-type: none"> <li>1. <i>Unstructured Computations on Emerging Architectures</i> <ol style="list-style-type: none"> <li>(a) SIAM Conference on Computational Science and Engineering, 2019. Spokane, Washington, USA</li> </ol> </li> <li>2. <i>BEMFMM: An Extreme Scale FMM-Accelerated BIE Solver for Wave Scattering</i> <ol style="list-style-type: none"> <li>(a) SIAM Conference on Computational Science and Engineering, 2019. Spokane, Washington, USA</li> <li>(b) Intel eXtreme Computing User Group (IXPUG) Meeting, 2018. KAUST, KSA</li> <li>(c) SIAM Conference on Parallel Processing for Scientific Computing, 2018. Tokyo, Japan</li> </ol> </li> <li>3. <i>Optimizations of Unstructured Aerodynamics Computations for Intel Knights Landing Architecture</i> <ol style="list-style-type: none"> <li>(a) Intel eXtreme Computing User Group (IXPUG) Meeting, 2018. KAUST, KSA</li> <li>(b) SIAM Conference on Parallel Processing for Scientific Computing, 2018. Tokyo, Japan</li> <li>(c) Intel HPC Developer Conference, 2017. Denver, Colorado, USA</li> <li>(d) Fully Predictive Complex Computational Fluid Dynamics Workshop, 2017. KAUST, KSA</li> <li>(e) High Performance Computing Saudi Arabia (HPC Saudi) Conference, 2017. KAUST, KSA <i>Received best poster award</i></li> <li>(f) SIAM Conference on Computational Science and Engineering, 2017. Atlanta, Georgia, USA</li> <li>(g) Scalable Hierarchical Algorithms for eXtreme Computing Workshop, 2017. KAUST, KSA</li> </ol> </li> <li>4. <i>Performance Evaluation of Fast Multipole Method on Intel Manycore Architecture</i> <ol style="list-style-type: none"> <li>(a) International European Conference on Parallel and Distributed Computing (Euro-Par), 2017. Galicia, Spain</li> <li>(b) HPC in Asia Poster Competition, International Supercomputing Conference (ISC), 2017. Frankfurt, Germany</li> </ol> </li> <li>5. <i>Implicit Unstructured Computational Aerodynamics on Many-Integrated Core Architecture</i> <ol style="list-style-type: none"> <li>(a) International Conference on Parallel Computational Fluid Dynamics, 2014. Trondheim, Norway</li> <li>(b) Scalable Hierarchical Algorithms for eXtreme Computing workshop, 2014. KAUST, KSA</li> </ol> </li> </ol>
<b>Programming</b>	<p>LANGUAGES – C/C++, Python, Java, Unix Shell, MATLAB, <math>\text{\LaTeX}</math></p> <p>MODELS – Intel Intrinsics, MPI, OpenMP, pThreads, CUDA</p> <p>TOOLS – Make, CMake, GNU Autotools, perf tools, Valgrind, GNU Debugger, Tracing, gnuplot, Git</p>