Mohammed A. Al Farhan

Ph.D. Candidate in Computer Science

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Research Interests

High-performance computing, Computational fluid dynamics, Performance optimizations, Intel Xeon Phi programming, and Parallel computing.

Education

King Abdullah University of Science and Technology — Thuwal, Saudi Arabia
P.hD., Computer Science — Aug'14 - Present
- Thesis Title: Unstructured Computational Aerodynamics on Many Integrated Core Architecture, Advisor: Professor David E. Keyes.

King Abdullah University of Science and Technology — Thuwal, Saudi Arabia
M.Sc., Computer Science — Sep'12 - Dec'13
- Coursework: Algorithm analysis and design, Parallel programming paradigms (MPI, OpenMP, CUDA, and OpenACC), Programming languages, Combinatorial machine learning, High-performance computing I & II (algorithms, architectures, and applications), Computing systems and concurrency, and Data analytics (artificial intelligence, data mining, and machine learning).

King Faisal University — Al-Hasa, Saudi Arabia
B.Sc., Computer Science — Sep'07 - Feb'12
- Senior Project: Developed a system for using a programmable RFID chips to facilitate access to classrooms. The project was supplemented with an implementation of a web system for the end-user interface and a client application for the communication between the RFID and the web system.

Research Experience

King Abduallah University of Science and Technology — Thuwal, Saudi Arabia
Advised by Professor David E. Keyes — Aug'14 - Present
- Exploring unstructured PDE-based computations on highly parallel SIMD-style emerging multi- and many-core architectures via studying several optimization means to extract instruction-, vector-, and thread-level parallelism for a complex and large-scale CFD computations.

King Abduallah University of Science and Technology — Thuwal, Saudi Arabia
Advised by Professor David E. Keyes — Jul'13 - Jul'14
- Investigated how hybrid programming paradigm (MPI+OpenMP) on unstructured PDE-based CFD codes can exploit many integrated core architecture with upwards of 60 cores per node and 4 threads per core.

King Abduallah University of Science and Technology — Thuwal, Saudi Arabia
Advised by Professor Mikhail Moshkov — Jan'13 - Jun'13
- Designed and implemented a classification algorithm that constructs classifiers for supervised machine learning training sets using decision trees and decision rule systems.

Professional Experience

Saudi Electricity Company — Riyadh, Saudi Arabia

Information System Analyst — May'12 - Aug'12

- Developed a software system based on intelligent algorithms that detected anomalies such as malfunctions, tampers, and manipulations in the reading meters of customers.

Saudi Aramco — Dhahran, Saudi Arabia
Intern, Software Developer — Jul'11 - Sep'11

- Implemented a software system to keep track of all IT incidents and problems, and then, updates the concerned parties on the current status of the said problem, automatically effectively reducing managerial bottlenecks.

Saudi Aramco — Dhahran, Saudi Arabia
Intern, Software Developer — Jul'10 - Aug'10

- Programmed an interface that collects reports on IT problems and logs them into a unified database repository where they can always be recalled for further processing with ease.

Teaching Experience

Teaching Assistant (TA) for High-Performance Computing II (AMCS/CS 312). KAUST, Fall 2014; Fall 2015.

Journal Publications

Al Farhan, M. A., Kaushik, D. K., and Keyes, D. E. Unstructured Computational Aerodynamics on Many Integrated Core Architecture. *Under review for Parallel Computing Journal.*

Conference Publications

AbouEisha, H., **Al Farhan, M.**, Chikalov, I. and Moshkov, M. An algorithm for reduct cardinality minimization. grc, pp.1-3, 2013 IEEE International Conference on Granular Computing (GrC).

Conference Presentations

Al Farhan, M. A. and Keyes, D. E. Implicit Unstructured Computational Aerodynamics on Many-Integrated Core Architecture. 26th Conference on Parallel Computational Fluid Dynamics. May 2014. Trondheim, Norway.

Poster Presentations

Al Farhan, M. A. and Keyes, D. E. Implicit Unstructured Computational Aerodynamics on Many-Integrated Core Architecture. Scalable Hierarchical Algorithms for eXtreme Computing (SHAXC)-2 Workshop. May 2014. KAUST, Thuwal, Saudi Arabia.

Technical Skills

C/C++, Java, Python, Fortran, MPI, OpenMP.

Professional Membership

Society for Industrial and Applied Mathematics (SIAM).
Association for Computing Machinery (ACM).
Institute of Electrical and Electronics Engineers (IEEE).

References

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