

Huda Ibeid

Intel Corporation
email: huda.ibeid@intel.com

Research Interests

High performance computing; Parallel programming models; Performance modeling;
Fast multipole methods; Fast PDE solvers

Education

King Abdullah University of Science and Technology (KAUST), KSA
Ph.D., Computer Science, 2016
Advisor: Prof. David Keyes

King Abdullah University of Science and Technology (KAUST), KSA
M.S., Computer Science, 2012

University of Jordan, Jordan
B.Eng., Computer Engineering, 2010

Professional Experience

Intel Corporation, CA, USA 2019-present
HPC performance architect.

University of Illinois at Urbana-Champaign, IL, USA 2017-2018
Postdoctoral research associate.

University of Oxford, Oxford, UK Summer 2012
Research Intern, Oxford Centre for Collaborative Applied Mathematics.

Rose-Hulman Institute of Technology, IN, USA Spring 2010
Intern, course-based internship in the Department of Computer Science.

Research Honors and Awards

Selected to participate in Rising Stars in EECS 2019

Google Travel Grant 2016
Grace Hopper Conference, Houston, USA

Google Women Techmakers Scholarship 2014-2015
Awarded based on academic performance, leadership, and impact.

Travel Grant 2013
Supercomputing Conference (SC'13), Denver, USA

Invited to attend the Microsoft Research Summer School 2013
Cambridge, UK

KAUST Academic Excellence Award 2011-2012
For distinguished students in academics and research.

Peer-reviewed Publications

1. **H. Ibeid**, L. Olson, and W. Gropp. FFT, FMM, and Multigrid on the Road to Exascale: performance challenges and opportunities. *Journal of Parallel and Distributed Computing*, 2020.
2. **H. Ibeid**, S. Meng, O. Dobon, L. Olson, and W. Gropp. Learning with Analytical Models. In *IEEE International Parallel and Distributed Processing Symposium Workshops (IPDPSW)*, 2019.
3. **H. Ibeid**, R. Yokota, J. Pestana, and D. Keyes. Fast Multipole Preconditioners for Sparse Matrices Arising from Elliptic Equations. *Computing and Visualization in Science*, 2018.
4. M. Abduljabbar, G. Markomanolis, **H. Ibeid**, R. Yokota, and D. Keyes. Communication Reducing Algorithms for Distributed Hierarchical N-Body Problems with Boundary Distributions, *International Supercomputing Conference (ISC)*, 2017.
5. **H. Ibeid**, R. Yokota, and D. Keyes. A performance model for the communication in fast multipole methods on high-performance computing platforms. *International Journal of High Performance Computing Applications (IJHPCA)*, 2016.
6. R. Yokota, **H. Ibeid**, and D. Keyes. Fast Multipole Method as a Matrix-Free Hierarchical Low-Rank Approximation. In *International Workshop on Eigenvalue Problems: Algorithms; Software and Applications, in Petascale Computing (EPASA)*, Lecture Notes in Computer Science, 2015.
7. Y. Ohno, R. Yokota, H. Koyama, G. Morimoto, A. Hasegawa, G. Masumoto, N. Okimoto, Y. Hirano, **H. Ibeid**, T. Narumi, and M. Taiji. Petascale molecular dynamics simulation using the fast multipole method on K computer. *Computer Physics Communications*, 2014.
8. **H. Ibeid**, D. Kaushik, D. Keyes, and H. Ltaief. Toward Accelerating the Matrix Inversion Computation of Symmetric Positive-Definite Matrices on Heterogenous GPU-Based Systems. *Student Research Symposium, The annual IEEE International Conference on High Performance Computing (HiPC)*, 2011.

Conference Presentations

1. M. Abduljabbar, N. Al-Harhi, M. Al Farhan, R. Chen, **H. Ibeid**, R. Yokota, H. Bagci, and D. Keyes. FMM-Accelerated Wave Scattering Solver on Emerging Many and Multi-Core High-Performance Computing Architectures. *SIAM Conference on Parallel Processing for Scientific Computing*, Tokyo, Japan, 7-10 March, 2018.
2. **H. Ibeid**, L. Olson, and W. Gropp. FFT, FMM, and MG on the road to exascale (poster). *Supercomputing Conference (SC'17)*, Denver, USA, 12-17 Nov, 2017.
3. **H. Ibeid**, R. Yokota, and D. Keyes. A Matrix-Free Preconditioner for Elliptic Solvers Based on the Fast Multipole Method. *SIAM Conference on Parallel Processing for Scientific Computing*, Paris, France, 12-15 April, 2016.
4. **H. Ibeid**, J. Pestana, R. Yokota, and D. Keyes. Fast Multipole Method as Preconditioner. *SIAM Conference on Computational Science and Engineering*, Salt Lake, USA, 14-18 March, 2015.
5. **H. Ibeid**, R. Yokota, J. Pestana, and D. Keyes. Fast Multipole Preconditioners for Sparse Linear Solvers. *The 11th World Congress on Computational Mechanics (WCCM XI)*, Barcelona, Spain, 20-25 July, 2014.

6. **H. Ibeid**, R. Yokota, J. Pestana, and D. Keyes. Fast Multipole-based Preconditioner for Sparse Iterative Solvers. *Early Research Showcase, Supercomputing Conference (SC'13)*, Denver, USA, 17-22 Nov, 2013.
7. J. Pestana, R. Yokota, **H. Ibeid**, and D. Keyes. Fast Multipole Method Preconditioners for Discretizations of PDEs. *International Conference On Preconditioning Techniques For Scientific And Industrial Applications*, Oxford, UK, 19-21 June, 2013.
8. **H. Ibeid**, J. Pestana, R. Yokota, and D. Keyes. Fast Multipole Method as Preconditioner. *SIAM Conference on Computational Science and Engineering*, Boston, MA, USA, 25 February-1 March, 2013.

Professional Activities

External reviewer, Euro-Par Workshops	2017
President of KAUST SIAM student chapter	2015-2016
Chair of KAUST ACM student chapter	2015-2016
SIAM student chapter representative Computational Science and Engineering Conference (CSE), Salt Lake city, Utah, USA.	2015
Google EMEA Anita Borg Scholars Engage Program	2014-2015
Member of KAUST Graduate Council	2014-2015
Student Volunteer, Supercomputing Conference (SC'13) Denver, CO, USA.	2013
Student Volunteer, SAHPC Saudi Arabian High Performance Computing Conference.	2012
Volunteer at KAUST's Code Clinics	2011-2016