

Mert Hidayetoğlu

PhD Candidate

hidayet2@illinois.edu

Education

University of Illinois at Urbana-Champaign

Electrical and Computer Engineering

Doctor of Philosophy, May 2022 (expected)

Advisors: Weng Cho Chew and Wen-mei Hwu

Computational Science and Engineering Concentration

Bilkent University

Electrical and Electronics Engineering

Master of Science, April 2015

Advisors: Levent Gürel and Ömer İlday

Bachelor of Science, January 2013

Research Interests

Parallel Processing, Fast Algorithms, Inverse Problems, Supercomputing

Technical Skills & Experience

Programming

C/C++, CUDA, MPI, OpenMP, MATLAB, Python, Fortran, Java, and VHDL

CAD & Simulation

AirSim, NX, Solidworks, I-DEAS, CATIA, and SPICE

Supercomputing

NCSA Blue Waters (500k node-hours), ALCF Theta (250k node-hours), OLCF Summit (20k node-hours), TACC Frontera (11k node-hours), RIKEN Fugaku (100k node-hours), HPC cloud (e.g., Microsoft Azure).

Work Experience

08/2015 – present

Research Assistant, Coordinated Science Laboratory

Location
Urbana, IL

- Performance optimizations for sparse/irregular computations on GPUs
- Design and implementation of memory-centric algorithm on 3D X-ray tomography (with scaling up to 4,096 KNLs – 256k cores – and 24,576 GPUs)
- Participation in MIT/Amazon/IEEE Graph Challenge (2020 Champion) [\[Link\]](#)
- GPU algorithms for sparse deep neural network inference with large models
- Heterogeneous and out-of-core algorithms for large-scale applications
- Thesis work on hierarchical communications for distributed sparse matrix multiplication (reduces inter-node communication volume by 60%)

08/2015 – 05/2019

Research Assistant, Electrical and Computer Engineering Department

Urbana, IL

- Fast and parallel algorithms for scattering problems
- Design and implementation of massively-parallel inverse multiple-scattering imaging (scaling up to 4,096 GPUs)
- Deployment of large-scale distributed linear and nonlinear optimization methods
- Fast spectral techniques & parallelization for 2.5-dimensional modeling

05/2019 – 08/2019

Research Intern, IBM T. J. Watson Research Center

Cambridge, MA

- Optimization of HPCG benchmark on OLCF Summit
- Data centric systems and high-performance computing group

05/2018 – 08/2018

Givens Associate, Argonne National Laboratory

Lemont, IL

- Supercomputing solutions for ptycho-tomographic imaging
- Data science and learning (DSL) and X-ray science (XSD) divisions

07/2016 – 08/2016

Research Assistant, The University of Hong Kong

Hong Kong S.A.R., China

- On-site collaboration with computational electromagnetics group

08/2012 – 08/2015

Co-Founder & Staff, ABAKUS Computing Technologies

Ankara, Turkey

- Conducting industry- and government-funded research projects
- Organization of CEM'15 Computational Electromagnetics Workshop
- *See other duties under BiLCEM*

İzmir, Turkey

12/2010 – 10/2014

Research Assistant, Computational Electromagnetics Research Center (BiLCEM)

Ankara, Turkey

- Development of novel and parallel out-of-core electromagnetics solvers
- Accurate and fast solutions of large-scale electromagnetics problems
- Implementation of iterative solvers and preconditioners for solutions of extremely-large dense linear systems (up to $N = 2.1$ billion unknowns!)
- Assistant in CEM'13 Computational Electromagnetics Workshop

İzmir, Turkey

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| 06/2011 – 09/2011 | Summer Intern, BiLCEM | Ankara, Turkey |
| | <ul style="list-style-type: none"> Development of a parallel mesh refinement code for large-scale geometries Assistant in CEM'11 Computational Electromagnetics Workshop | İzmir, Turkey |
| 06/2010 – 07/2010 | Summer Intern, ETA Electronic Design Inc. | Ankara, Turkey |
| | <ul style="list-style-type: none"> Implementation and documentation of a testing software for a power distribution system (of MILGEM Turkish cruiser) | |
| Teaching Experience | Co-developer, NVIDIA Accelerated Computing Teaching Kit – Multi-GPU Systems [Link] | |
| | Teaching Assistant, Barcelona Supercomputing Center, Spain | |
| | <ul style="list-style-type: none"> Programming and Tuning Massively Parallel Systems + Artificial Intelligence (PUMPS+AI) Summer School [Link] | June 2019 |
| | <ul style="list-style-type: none"> Lecture 9: Scalable Algorithms and Supercomputing Applications Mentor of a clinic case study: Lattice Boltzman method for multi-GPU clusters Programming and Tuning Massively Parallel Systems (PUMPS) Summer School Lecture 12.4: Massively-Parallel Heterogeneous Computing Mentor of a clinic case study: Runge-Kutta type integrator scheme for a stochastic Schrödinger equation (mentee won the best poster award and a GPU) | June 2017 |
| | Teaching Assistant, Department of Electrical and Computer Engineering, Urbana, IL | |
| | <ul style="list-style-type: none"> ECE 408 Applied Parallel Programming guest lecture: Programming GPU Cluster ECE 508 Manycore Parallel Algorithms ECE 408 Applied Parallel Programming guest lecture: Programming GPU Cluster ECE 350 Fields and Waves II | Dec. 2019 Spring 2019 Nov. 2018 Spring 2017 |
| | National Center for Supercomputing Applications (NCSA), Urbana, IL | |
| | <ul style="list-style-type: none"> Crash course on CUDA to National Geospatial-Intelligence Agency Mentor to Lawrence Berkeley Lab for NCSA GPU Hackaton | Nov. 2018 Sept. 2018 |
| | Teaching Assistant, Bilkent University Department of Electrical and Electronics Engineering, Ankara, Turkey | 01/2013 – 04/2015 |
| | <ul style="list-style-type: none"> EEE 212 Microprocessors (3 Semesters) EEE 202 Circuit Theory EEE 491 Electrical and Electronics Engineering Design | |
| | Undergraduate Tutor, Bilkent University Academic Student Coordination Unit | Summer 2012 |
| | <ul style="list-style-type: none"> CS 114 Introduction to Programming for Engineers | |
| | Coordinator and Lecturer, BiLCEM-IEEE Student Branch | 11/2011 – 05/2012 |
| | <ul style="list-style-type: none"> Introduction to Unix/Linux, FORTRAN, parallel computing, parallel programming, and MATLAB classes | |
| Honors, Awards, and Recognitions | SC20 Best Paper – Winner (Lead author) | |
| | ACM Student Research Competition – SC20 1 st Place | |
| | ACM SIGHPC Certificate of Appreciation, 2020 | |
| | MIT/Amazon/IEEE Sparse DNN Graph Challenge Champion 2020 (Lead author) | |
| | HPCC Best Paper Award 2019 | |
| | IEEE TCPP / NSF Travel Grant for IPDPS 2019 | |
| | ECE Illinois Paul D. Coleman Outstanding Research Award 2018 | |
| | Argonne National Laboratory Givens Fellowship, Class of 2018 | |
| | IPDPS PhD Forum Outstanding Poster Presentation 2018 (by public voting, presenter) | |
| | Grainger College of Engineering Computational Science and Engineering Fellow, Class of 2018 | |
| | National Academies Travel Grant for USNC-URSI 2017, 2018 | |
| | ECE Illinois Dan Vivoli Endowed Fellowship 2017 | |
| | ECE Illinois Professor Kung Chie Yeh Endowed Fellowship 2016 | |
| | Turkcell Technology Leaders Graduate Scholarship Program, Class of 2014 | |
| | TÜBİTAK Graduate Research Scholarship (2013–2014) | |
| | Bilkent University EEE Department Research Excellence Award 2013 | |
| | BiLCEM undergraduate research fellowship (2011–2013) | |
| Professional Service | SC20 SCC Reproducibility Challenge Benchmark Lead Author [Link] | |
| | ICCEM 2020 Organizer and Co-Chair of Special Session on Complex Inverse Problems | |
| | IPDPS 2020 Proceedings Vice-Chair for PhD Forum (Cancelled due to COVID-19 Pandemic) | |
| | Session Assistant at 2019 (57 th) Allerton Conference | |
| | Volunteer Student Assistant IPDPS 2018 | |
| | Co-organizing CEM'17 Int. Computing and Electromagnetics Workshop | |
| | Volunteer Student Assistant 2014 IEEE AP-S/URSI Symposium | |

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| Reviewing & Editing Activities | IEEE Transactions on Antennas and Propagation (4 papers) | |
| | IEEE Antennas and Propagation Magazine | |
| | IEEE International Conference on Computational Electromagnetics (ICCEM) | |
| | International Workshop on Computing, Electromagnetics, and Machine Intelligence | |
| | IEEE International Parallel and Distributed Processing Symposium (IPDPS) | |
| | International Symposium on Computer Architecture (ISCA) | |
| | Elsevier Parallel Computing | |
| Involved Centers & Projects | D. Kirk and W.-M. W. Hwu, <i>Programming Massively Parallel Processors</i> . 3rd ed., 2017. | |
| | <u>Industry</u> | Supporter |
| | Computational Methods for Antennas Mounted on Platforms (PLANT-I) | ASELSAN-SSM |
| | Jet Trainer/Fighter Radar Cross Section Analysis (FX/TX) | TAI-SSM |
| | Radar Cross Section Calculations of Chaff Clouds | ASELSAN |
| | NVIDIA Center of Excellence - UIUC | NVIDIA |
| | Center for Cognitive Computing Systems Research (C3SR) | IBM |
| | Applications Driving Architectures (ADA) Center | SRC-DARPA |
| | <u>Government</u> | |
| | Breast Cancer Detection via Inverse Scattering Algorithms | TÜBİTAK |
| | Parallel Electromagnetic Equivalence Principle Algorithm | TÜBİTAK |
| | Petascale Application Improvement Discovery (PAID-IME) | NSF-NCSA |
| | Sustained-Petascale In Action: Blue Waters Enabling Transformative Science and Engineering | NSF |
| | Vancouver II: Improving Programmability of Contemporary Heterogeneous Architectures | DOE |
| | Leadership Class Scientific and Engineering Computing: Breaking Through the Limits | NSF |
| | High Accuracy, Broadband Simulation of Complex Structures with Quantum Effects, | NSF |
| | Parallel Fast Algorithm, and Integral Equation Domain Decomposition | |
| | Rapid Analysis of Various Emerging Nanoelectronics (RAVEN) | IARPA |
| | CORAL: Collaboration of Oak Ridge, Argonne, and Lawrence Livermore | DOE |
| | <u>University</u> | |
| | Alchemy: University Technology Foundry | UIUC |
| | A New Paradigm in Ultrasonic Image Formation: Inverse Scattering | UIUC |
| | ASELSAN: <i>Military Electronic Industries Inc. (of Turkey)</i> | |
| | SSM: <i>Undersecretariat for Defense Industries (of Turkey)</i> | |
| | TAI: <i>Turkish Aircraft Industries Inc.</i> | |
| | TÜBİTAK: <i>Scientific and Technological Research Council of Turkey (NSF of Turkey)</i> | |
| Book Chapter | W. C. Chew, Q. I. Dai, Q. S. Liu, T. Xia, T. E. Roth, H. Gan, A. Liu, S. C. Chen, M. Hidayetoğlu , L. J. Liang, S. Sun, and W.-M. Hwu, <i>New Trends in Computational Electromagnetics</i> . Ö. Ergül, Ed. London: The Institute of Engineering and Technology, Dec. 2019. | |
| Journal Papers | L. L. Meng, M. Hidayetoğlu , T. Xia, Wei E. I. Sha, L. J. Jiang, and W. C. Chew, "A wide-band two-dimensional fast multipole algorithm with a novel diagonalization form," <i>IEEE Trans. Antennas Propag.</i> , vol. 66, no. 12, pp. 7477–7482, Dec. 2018. | |
| | D. J. Ching, M. Hidayetoğlu , T. Biçer, and D. Gürsoy, "Rotation-as-fast-axis scanning-probe x-ray tomography: the importance of angular diversity for fly-scan modes," <i>Appl. Opt.</i> , vol. 57, no. 30, pp. 8780–8789, Oct. 2018. | |
| | M. Hidayetoğlu , M. L. Oelze, W.-M. W. Hwu, and W. C. Chew, "Efficient formulation and parallelization of inverse multiple-scattering imaging," <i>IEEE Trans. Antennas Propag.</i> , in prep. | |
| Conference Papers *Presenting Author | M. Hidayetoğlu* , T. Bicer, S. Garcia de Gonzalo, B. Ren, V. De Andrade, D. Gursoy, R. Kettimuthu, I. T. Foster, and W.-M. W. Hwu, "Petascale XCT: 3D image reconstruction with hierarchical communications on multi-GPU nodes," <i>The International Conference for High Performance Computing, Networking, Storage, and Analysis (SC20)</i> , Atlanta, GA, Nov. 2020. (~17% acceptance rate, best paper & best student paper finalist) [Arxiv] | |
| | M. Hidayetoğlu* , C. Pearson, V. S. Malthody, E. Ebrahimi, J. Xiong, R. Nagi, and W.-M. Hwu, "At-scale sparse deep neural network inference with efficient GPU implementation," <i>IEEE High Performance Extreme Computing (HPEC'20)</i> , Waltham, MA, Sep. 2020. (Graph Challenge Champion) [Arxiv] | |
| | M. Hidayetoğlu* , T. Biçer, S. Garcia de Gonzalo, B. Ren, D. Gürsoy, R. Kettimuthu, I. T. Foster, and W.-M. W. Hwu, "MemXCT: Memory-centric X-ray CT reconstruction with massive parallelization," <i>The International Conference for High Performance Computing, Networking, Storage, and Analysis (SC19)</i> , Denver, CO, Nov. 2019. (~21% acceptance rate, SC20 reproducibility challenge benchmark) | |
| | O. Anjum, S. Garcia de Gonzalo, M. Hidayetoğlu , and W.-M. Hwu*, "An efficient GPU implementation technique for higher-order 3D stencils," <i>Int. Conf. High Performance Computing and Communications (HPCC-2019)</i> , Zhangjiajie, China, Aug. 2019. (~19% acceptance rate won the best paper award) | |
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Workshop Papers & Extended Abstracts

- M. Hidayetoğlu***, C. Pearson, I. El Hajj, L. Gürel, W. C. Chew, and W.-M. Hwu, “A fast and massively-parallel inverse solver for multiple-scattering tomographic image reconstruction,” *IEEE Int. Parallel Distributed Processing Symp. (IPDPS 2018)*, Vancouver, Canada, May 2018. (~20% acceptance rate)
- C. Pearson*, **M. Hidayetoğlu**, M. Almasri, O. Anjum, I-H. Chung, J. Xiong, and W.-M. Hwu, “Node-aware stencil communication for heterogeneous supercomputers,” *Int. Workshop on Automatic Performance Tuning (iWAPT 2020 - IPDPS Workshop)*, New Orleans, LA, May 2020.
- M. Hidayetoğlu***, W.-M. Hwu, and W. C. Chew, “Supercomputing for full-wave tomographic image reconstruction in near-real time,” *IEEE Int. Symp. on Antennas and Propagation and USNC-URSI Radio Science Meeting (AP-S/URSI 2018)*, Boston, MA, July 2018.
- M. Hidayetoğlu***, W.-M. Hwu, and W. C. Chew, “Seeing the invisible: limited-view imaging with multiple-scattering reconstruction,” *USNC-URSI Nat. Radio Science Meeting*, Boulder, CO, Jan. 2018.
- M. Hidayetoğlu***, C. Pearson, I. El Hajj, W. C. Chew, L. Gürel, and W.-M. Hwu, “Scaling analysis of large inverse multiple-scattering solutions,” *The International Conference on High Performance Computing, Networking, Storage and Analysis (SC17)*, Denver, CO, Nov. 2017.
- W.-M. Hwu*, **M. Hidayetoğlu**, W. C. Chew, C. Pearson, S. Garcia, S. Huang, and A. Dakkak, “Thoughts on massively-parallel heterogeneous computing for solving large problems,” *CEM’17 Computing and Electromagnetics Int. Workshop*, Barcelona, Spain, June 2017.
- M. Hidayetoğlu***, C. Pearson, L. Gürel, W.-M. Hwu, and W. C. Chew, “Scalable parallel DBIM solutions of inverse-scattering problems,” *CEM’17 Computing and Electromagnetics Int. Workshop*, Barcelona, Spain, June 2017.
- C. Pearson*, **M. Hidayetoğlu**, Wei Ren, W. C. Chew, and W.-M. Hwu, “Comparative performance evaluation of multi-GPU MLFMM implementation for 2-D VIE problems,” *CEM’17 Computing and Electromagnetics Int. Workshop*, Barcelona, Spain, June 2017.
- M. Hidayetoğlu***, C. Pearson, W. C. Chew, L. Gürel, and W.-M. Hwu, “Large inverse-scattering solutions with DBIM on GPU-enabled supercomputers,” *Applied and Computational Electromagnetics Symp. (ACES 2017)*, Florence, Italy, Mar. 2017.
- M. Hidayetoğlu**, C. Yang, L. Wang, A. Podkowa, M. Oelze, W.-M. Hwu, and W. C. Chew*, “Large-scale inverse scattering solutions with parallel Born-type fast solvers (Invited),” *Progress on Electromagnetics Research Symp. (PIERS 2016)*, Shanghai, China, Aug. 2016.
- M. Hidayetoğlu** and W. C. Chew*, “On computational complexity of the multilevel fast multipole algorithm in various dimensions,” *IEEE Int. Symp. on Antennas and Propagation/USNC-URSI Nat. Radio Science Meeting (AP-S/URSI 2016)*, Fajardo, Puerto Rico, June 2016.
- M. Hidayetoğlu** and L. Gürel*, “Full-wave and approximate solutions of large electromagnetic scattering problems,” *IEEE Int. Symposium on Antennas Propagation and North American Radio Science Meeting (AP-S/URSI 2015)*, Vancouver, Canada, July 2015.
- M. Hidayetoğlu*** and L. Gürel, “An MPIxOpenMP implementation of the hierarchical parallelization of MLFMA,” *Computational Electromagnetics Int. Workshop (CEM’15)*, Izmir, Turkey, July 2015.
- M. Hidayetoğlu** and L. Gürel*, “Parallel out-of-core MLFMA on distributed-memory computer architectures,” *Computational Electromagnetics Int. Workshop (CEM’15)*, Izmir, Turkey, July 2015.
- M. Salim*, A. O. Akkirmann, **M. Hidayetoğlu**, and L. Gürel, “Comparative benchmarking: matrix multiplication on a multicore processor and a GPU,” *Computational Electromagnetics Int. Workshop (CEM’15)*, Izmir, Turkey, July 2015.
- M. Hidayetoğlu*** and L. Gürel, “MLFMA memory reduction techniques for solving large-scale problems,” *2014 IEEE Int. Symp. on Antennas and Propagation and USNC-URSI National Radio Science Meeting (AP-S/URSI)*, Memphis, TN, July 2014.
- M. Hidayetoğlu***, B. Karaosmanoğlu, and L. Gürel, “Reducing MLFMA memory with out-of-core implementation and data-structure parallelization,” *Computational Electromagnetics Int. Workshop (CEM’13)*, İzmir, Turkey, Aug. 2013.

Invited Talks

- DOE Seminar Series on Large-Scale X-ray Tomography on Synchrotron Accelerator Light Sources
- CIDR Seminar, Los Alamos National Laboratory, 22 Oct. 2020. Host: [Brendt Wohlberg](#)
 - XCT Interest Group, Lawrence Berkeley National Laboratory, 18 Nov. 2020. Host: [Dula Parkinson](#)
- Memory-Centric, Low Complexity Image Reconstruction for the Exascale Era of Computing, Bilkent University Computer Engineering Department, Ankara, Turkey, Jan. 2020. [[Link](#)]
- Supercomputing for Full-Wave Tomographic Image Reconstruction in Near-Real Time, National Magnetic Resonance Research Center, Ankara, Turkey, Sep. 2018. [[Link](#)]
- Low-Complexity, Petascale, Heterogeneous Inverse Solvers on Blue Waters, Coordinated Science Laboratory, Urbana, IL, Feb. 2018. [[Link](#)]
- Fast and Parallel Algorithms for Large Full-Wave Image Reconstructions, Argonne National Laboratory, Lemont, IL, Dec. 2017. [[Link](#)]

Fast and Parallel Algorithms for Inverse Multiple-Scattering Solutions and Applications on Tomographic Imaging, National Center for Supercomputing Applications, Urbana, IL, Sep. 2017. [\[Link\]](#)

Fast and Parallel Algorithms for Multiple-Scattering Imaging, The University of Hong Kong, Hong Kong S.A.R., China, Aug. 2016. [\[Link\]](#)

Conference Talks

M. Hidayetoğlu*, W.-M. Hwu, and W. C. Chew, “High performance inverse multiple-scattering imaging,” *IEEE Int. Conf. Computational Electromagnetics (ICCEM 2020)*, Singapore, Aug. 2020.

M. Hidayetoğlu, W.-M. Hwu, and W. C. Chew*, “Efficient integration paths for fast 2.5-D Scattering,” *Progress in Electromagnetics Research Symp. (PIERS 2018)*, Toyama, Japan, Aug. 2018.

L. L. Meng*, **M. Hidayetoğlu**, T. Xia, W. C. Chew, W. E. I. Sha, and L. J. Jiang, “A novel diagonalization in two-dimensional fast multipole algorithm based on discrete Fourier transform,” *Progress on Electromagnetics Research Symp. (PIERS 2017)*, Singapore, Nov. 2017.

W.-M. Hwu*, **M. Hidayetoğlu**, C. Pearson, S. Garcia, S. Huang, and A. Dakkak, “Massively-parallel heterogeneous computing for solving large problems,” *CEM’17 Computing and Electromagnetics Int. Workshop*, Barcelona, Spain, June 2017. **(Plenary Talk)**

M. Hidayetoğlu*, A. Podkova, M. Oelze, W.-M. Hwu, and W. C. Chew, “Fast DBIM solutions on supercomputers with frequency-hopping for imaging of large and high-contrast objects,” *Progress on Electromagnetics Research Symp. (PIERS 2017)*, St. Petersburg, Russia, May 2017.

M. Hidayetoğlu*, A. Podkova, M. L. Oelze, L. Gürel, W.-M. Hwu, and W. C. Chew, “Incorporating multiple scattering in imaging with iterative Born methods,” *USNC-URSI Nat. Radio Science Meeting*, Boulder, CO, Jan. 2017.

A. Podkova*, **M. Hidayetoğlu**, W. C. Chew, and M. Oelze, “Reconstruction of spatially varying sound speed distributions from pulse-echo data,” *Meeting Acoustic Society America*, Honolulu, HI, Dec. 2016.

M. Hidayetoğlu and L. Gürel*, “Accelerating hybrid integral-equation and physical-optics solutions with MLFMA,” *URSI Atlantic Radio Science Conf. (AT-RASC 2015)*, Gran Canaria, Spain, May 2015.

Posters & Other Presentations

M. Hidayetoğlu and W.-M. Hwu (advisor), “Memory-centric 3D image reconstruction with hierarchical communications on multi-GPU node architecture,” *ACM Student Research Competition (SRC) of SC20*, Atlanta, GA, Nov. 2020. **(won the ACM Student Research Competition at SC20)**

S. L. Harrel, M. Taufer, B. Plale, V. M. Vergara, S. Michael, **M. Hidayetoglu**, and T. Bicer, SC20 vSCC Reproducibility Challenge Webinar, Aug. 2020. [\[Link\]](#)

M. Hidayetoğlu, Efficient inference on GPUs for the sparse deep neural network challenge 2020, IBM-Illinois Center for Cognitive Systems Research, Urbana, IL, Jul. 2020.

M. Hidayetoglu, Memory-Centric 3D Image Reconstruction on 24,576 GPUs, IBM-Illinois Center for Cognitive Systems Research, Urbana, IL, May 2020.

M. Hidayetoğlu, Remedies Towards Breaching Memory Wall for Sparse Computations, IBM-Illinois Center for Cognitive Systems Research, Urbana, IL, Oct. 2019.

M. Hidayetoğlu, Mohammad Al Masri, Carl Pearson, Jinjun Xiong, Rakesh Nagi, Wen-mei W. Hwu, “Efficient sparse veryDNN Inference,” *IBM-Illinois C3SR Open House*, Urbana, IL, Oct. 2019.

M. Hidayetoğlu, T. Biçer, S. Garcia de Gonzalo, B. Ren, D. Gürsoy, R. Kettimuthu, W. C. Chew, I. Foster, and W.-M. Hwu, “Memory-centric iterative X-ray image reconstruction,” *PhD Forum of IPDPS 2019*, Rio de Janeiro, Brazil, May 2019.

M. Hidayetoğlu, C. Pearson, I. El Hajj, W. C. Chew, L. Gürel, and W.-M. Hwu, “Large and massively-parallel image reconstruction accelerated with the multilevel fast multipole algorithm,” *PhD Forum of IPDPS 2018*, Vancouver, Canada, May 2018. **(won the second place among 32 posters.)**

M. Hidayetoğlu, W. C. Chew, and W.-M. Hwu, “Scalable full-wave image reconstruction on Blue Waters,” *Coordinated Science Laboratory Student Research Conference (CSLSC)*, Urbana, IL, Feb. 2018.

M. Hidayetoğlu and W.-M. Hwu, “Massively-parallel full-wave (nonlinear) tomographic imaging,” *Supercomputing (SC17)*, Denver, CO, Oct. 2017 (showcase for Illinois Parallel Computing Institute.)

M. Hidayetoğlu, C. Pearson, W.-M. Hwu, and W. C. Chew, “A 2-D volume equation solver on GPU for solutions of light scattering problems,” *International Year of Light at UIUC*, Urbana, IL, USA, Sep. 2015.

M. Hidayetoğlu and Ö. İlday, “A parallel physical optics solver for solving large-scale electromagnetics scattering problems,” *Bilkent IEEE Grad. Research Conf. (GRC’15)*, Ankara, Turkey, Mar. 2015.

M. Hidayetoğlu and L. Gürel, “Hybrid PO-MoM solutions of electromagnetic scattering problems involving PEC geometries,” *Bilkent IEEE Grad. Research Conf. (GRC’14)*, Ankara, Turkey, Mar. 2014.

M. Hidayetoğlu and L. Gürel, “Memory reduction by parallelizing data structures of MLFMA,” *Bilkent IEEE Graduate Research Conference (GRC’13)*, Ankara, Turkey, Mar. 2013.

M. Hidayetoğlu, B. Karaosmanoğlu, and L. Gürel, “MLFMA solutions of electromagnetic scattering from chaff clouds,” *Bilkent IEEE Graduate Research Conference (GRC’12)*, Ankara, Turkey, Mar. 2012.

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| News & Outreach | <p>CSL News, <i>CSL-Student-Led Interdisciplinary Team Continues to Earn Accolades</i>, Under Review.</p> <p><u>SC20 Best Paper Award News</u>, Nov. 2020</p> <ul style="list-style-type: none"> • SC20 Newsletter [Link] • Inside HPC [Link] • Barcelona Supercomputing Center [Link] • Scientific Computing World [Link] • Argonne National Laboratory [Link] • HPC Wire [Link] <p>CSL News, <i>CSL team crowned IEEE HPEC Graph Challenge champions</i>, Oct. 2020. [Link]</p> <p>CSL News, <i>CSL student's paper selected for international reproducibility competition</i>, May 2020. [Link]</p> <p>SC20 Newsletter, <i>SC20 Student Cluster Reproducibility Committee Chooses Benchmark Wisely</i>, Apr. 2020. [Link]</p> <p>APS Science 2017, <i>Real-time data analysis and experimental steering at the APS using large-scale computing</i>, Aug. 2018. [Link]</p> <p>HPC Wire, <i>34 University of Illinois Researcher Teams Awarded Allocations on Blue Waters Supercomputer</i>, June 2018. [Link]</p> <p>Blue Waters Annual Report, <i>Parallelization of the multilevel fast multipole algorithm (MLFMA) on heterogeneous CPU-GPU architectures</i>, 2017. [Link]</p> <p>ECE Illinois Newsletter and CSL News, <i>Hidayetoğlu Tackles Complex Imaging as CSE Fellow</i>, June 2017. [ECE Link], [CSL Link]</p> <p>Blue Waters Annual Report, <i>Parallelization of the multilevel fast multipole algorithm (MLFMA) on heterogeneous CPU-GPU architectures</i>, 2016. [Link]</p> <p>Bilkent News, <i>BiLCEM researchers making aircraft stealthier</i>, Mar. 2014. [Link]</p> |
| Dissertation | <p>M. Hidayetoğlu, "Large-scale solutions of electromagnetics problems using the multilevel fast multipole algorithm and physical optics," M.S. Thesis, Dept. Elect. Electron. Eng., Bilkent Univ., Ankara, Turkey, Apr. 2015.</p> |