

# Mert Hidayetoğlu

PhD Candidate

hidayet2@illinois.edu

## Education

**University of Illinois at Urbana-Champaign**

**Electrical and Computer Engineering**

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

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| <b>Reviewing &amp; Editing Activities</b>      | 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)  |                  |
|  | D. Kirk and W.-M. W. Hwu, <i>Programming Massively Parallel Processors</i> . 3rd ed., 2017.  |                  |
| <b>Involved Centers &amp; Projects</b>         | <u>Industry</u>  | <b>Supporter</b> |
|  | 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>  |                  |
| <b>Book Chapter</b>                            | W. C. Chew, Q. I. Dai, Q. S. Liu, T. Xia, T. E. Roth, H. Gan, A. Liu, S. C. Chen, <b>M. Hidayetoğlu</b> , 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.  |                  |
| <b>Journal Papers</b>                          | L. L. Meng, <b>M. Hidayetoğlu</b> , 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, <b>M. Hidayetoğlu</b> , 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.  |                  |
|  | <b>M. Hidayetoğlu</b> , 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.  |                  |
| <b>Conference Papers</b><br>*Presenting Author | <b>M. Hidayetoğlu*</b> , 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. ( <b>~17% acceptance rate, best paper &amp; best student paper finalist</b> ) [ <a href="#">Arxiv</a> ] |                  |
|  | <b>M. Hidayetoğlu*</b> , C. Pearson, V. S. Mailthody, 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. ( <b>Graph Challenge Champion</b> ) [ <a href="#">Arxiv</a> ]   |                  |
|  | <b>M. Hidayetoğlu*</b> , 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. ( <b>~21% acceptance rate, SC20 reproducibility challenge benchmark</b> )  |                  |
|  | O. Anjum, S. Garcia de Gonzalo, <b>M. Hidayetoğlu</b> , 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. ( <b>~19% acceptance rate won the best paper award</b> )  |                  |
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## Workshop/Meeting 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. Akkirman, **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, Argonne 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 & Talks and News

A. Arp, **M. Hidayetoglu**, and J. Xiong, “CSL team crowned IEEE HPEC Graph Challenge Champions,” *CSL News*, Oct. 2020. [\[Link\]](#)

**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. **(with best paper candidate)**

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.

A. Arp, M. Hidayetoglu, and W.-M. Hwu, “CSL student’s paper selected for international reproducibility competition,” *CSL News*, May 2020. [\[Link\]](#)[\[Link\]](#)

**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.

T. Bicer, R. Kettimuthu, D. Gursoy, V. De Andrade, F. De Carlo, W. Scullin, B. Ren, **M. Hidayetoglu**, and I. T. Foster, “Real-time data analysis and experimental steering at the APS using large-scale computing,” *APS Science 2017: Research and Engineering Highlights from the Advanced Photon Source at Argonne National Laboratory*, Aug. 2018. [\[Link\]](#)

**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.)

L. Gürel, **M. Hidayetoğlu**, W.-M. Hwu, W. C. Chew, N. Aluru, and Carl Pearson, “Parallelization of the multilevel fast multipole algorithm (MLFMA) on heterogeneous CPU-GPU architectures,” *Blue Waters Annual Report*, 2017. [\[Link\]](#)

## Dissertation

- J. Sullivan and **M. Hidayetoğlu**, “Hidayetoğlu Tackles Complex Imaging as CSE Fellow,” *ECE Illinois Newsletter* and *CSL News*, June 2017. [[ECE Link](#)], [[CSL Link](#)]
- L. Gürel, **M. Hidayetoğlu**, W.-M. Hwu, W. C. Chew, N. Aluru, and Carl Pearson, “Parallelization of the multilevel fast multipole algorithm (MLFMA) on heterogeneous CPU-GPU architectures,” *Blue Waters Annual Report*, 2016. [[Link](#)]
- 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.
- L. Gürel and **M. Hidayetoğlu**, “BiLCEM researchers making aircraft stealthier,” *Bilkent News*, Mar. 2014. [[Link](#)]
- 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.
- 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.