

*Curriculum Vita*

**Tarek El-Ghazawi**

**Professor of ECE and IEEE Fellow  
Director, GW Institute for Massively Parallel Applications and Computing  
Technologies (IMPACT)**

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PRESENT OCCUPATION:

**Professor**, Department of Electrical and Computer Engineering, **The George Washington University**, Washington D.C.

[8/2003-present]

**Director**, Institute for Massively Parallel Applications and Computing Technology (IMPACT), and the GWU High-Performance Computing Academic Signature Program.

[4/2007-present]

**Director**, GW Strategic Academic Excellence Program in High-Performance Computing

[7/2006-present]

EDUCATION:

**Doctor of Philosophy in Electrical and Computer Engineering, New Mexico State University, May 1988**

Dissertation Topic: Theory and Design of a Real-Time Motion Detection Computer System

Major Field: **Computer Engineering**

Minor Field: **Computer Science**

**Master of Science in Electrical and Computer Engineering, New Mexico State University, May 1984**

Major Field: Computer Control Systems

Thesis Title: Analytical Design of Digital Controllers with Minimum Settling Time

**Master of Science in Control Systems Engineering** [completed courses in Linear Control, Stochastic Control, Optimal Control, Nonlinear Control], **Cairo University, May 2002**. (Transferred to U.S. after completing above course work)

**Bachelor of Science in Electronics and Communications Engineering, Helwan University, Cairo, Egypt, May 1980**

AREAS OF RESEARCH INTEREST:

- High-Performance Computing
- Heterogeneous and Extreme Computing Systems
- Convergence of HPC, Big Data, Cloud, AI and IoT
- Computer Architectures
- Nano-photonic enabled computing
- Image Processing and Remote Sensing Applications
- Parallel Programming Models
- Performance Evaluations and Workload Characterization

HONORS AND PROFESSIONAL MEMBERSHIPS:

- Fellow, Institute of Electrical and Electronics Engineers (IEEE)

- Alexander von Humboldt Research Award, Humboldt Foundation, Germany( Given to 100 scientist per year from across the world and across all disciplines)
- 2012 Alexander Schwarzkopf Prize for Technological Innovation
- IEEE Outstanding Leadership Award, IEEE Technical Committee on Scalable Computing
- IEEE Computer Society Distinguished Visitors Program (DVP) Speaker.
- U.K. Royal Academy of Engineering Distinguished Visiting Fellow
- GWU SEAS Distinguished Researcher Award, 2015
- Senior Fulbright Scholar, 2011-2012.
- IBM Faculty Fellow, IBM Center for Advanced Studies, Toronto.
- IBM Faculty Partnership Award, 2004
- Member, ACM SigHPC
- FIP WG10.3 (elected)
- Phi Kappa Phi National Honor Society
- Member, IEEE Computer Society Fellows Selection Committee, 2012-2015
- Member, SigmaXi, The Scientific Research Honor Society

#### SPONSORED RESEARCH AWARDS:

1. IDIEA-DC: An Infrastructure for Distributed Intelligence Experimentation and Architectures in the Digital Continuum: from IoTs to the Cloud. National Science Foundation, \$300K. Tarek El-Ghazawi (P.I.). (8/20-7/22)
2. RANC: A Residue Arithmetic Nanophotonic Computer, Airforce office of Scientific Research, \$675K. Tarek El-Ghazawi (PI) and Volker Sorger (Co-PI). (8/19-7/22).
3. RAISE: The Reconfigurable Optical Computer (ROC), National Science Foundation, \$900K. Tarek El-Ghazawi (PI) and Volker Sorger (coPI). (8/17-7/21).
4. Photonic Convolutional Processor for Network Edge-Computing, Office of Naval Research (ONR), \$3.1M. Volker Sorger (PI), Tarek El-Ghazawi (Co-PI) in collaboration with UT Austin and UCLA. (7/19-6/22)
5. Fourier Optics Multiplication Accelerator for Convolutional Neural Networks and Cryptographic Applications. Army Research Office (ARO), \$1.1M. Volker Sorger (PI) and Tarek El-Ghazawi (CoPI). (10/19 – 9/22).
6. Collaborative Research: Nanophotonic Neuromorphic Computing, \$1.33M. NSF/SRC Pruncal (PI, Princeton), Sorger (coPI), and El-Ghazawi (coPI). (10/17-9/21).
7. Intel Parallel Computing Center, Intel Corporation, \$250K in cash in addition to software, hardware and training. Tarek El-Ghazawi (P.I.). (6/16-12/18).

8. High-Performance Computing for Big Data, National Institute of Standards and Technology (NIST)/ Department of Commerce, \$100K. Tarek El-Ghazawi (PI). 3/1/16-11/30/16.
9. Dynamically Adaptive Hybrid Nanoplasmonic Networks on Chip (NoCs). Airforce Office of Scientific Research, \$752K. Tarek El-Ghazawi (P.I.) with Volker Sorger (CoPI) and Vikram Narayana (CoPI). (9/15-9/18).
10. Architecture Support for Advancing PGAS (ASAP). National Science Foundation, \$230K. Tarek El-Ghazawi (P.I.). (8/15-7/17).
11. Sustainable co-synthesis of cement and fuels, NSF \$1.5M, co-PI Tarek El-Ghazawi, with PI Stuart Licht, co-PIs Peter LaPuma, Henry Teng, Sabrina McCormick. (08/01/12 - 07/31/16)
12. The NSF Industry/University Center for Reconfigurable High-Performance Computing (CHREC). Collaborative National Center with Sites at UF, VT, and BYU. GWU Site jointly funded by NSF, Intel, AMD, HP, SGI, NSA, ONR, NRO, Arctic Region Supercomputing Center. GWU site funding (3/06-8/15, \$2M). Tarek El-Ghazawi (GWU P.I.).
13. A Scalable Heterogeneous Architecture for Big Data, National Institute for Standards and Technology (NIST)/ Department of Commerce, \$125K. Tarek El-Ghazawi (PI). 9/1/14-8/31/15.
14. MRI: Acquisition of a High-Performance Instrument for Interdisciplinary Computational Science and Engineering. NSF, \$1.1M. Tarek El-Ghazawi (P.I.) with Mittal, Lang, Lee and Briscoe. (10/09-09/14).
15. Collaborative Research: FRP: Productive Scientific Computing on Heterogeneous Systems. NSF, \$200K. Tarek El-Ghazawi (GW P.I.) with Alan George (UF). 08/01/12 - 01/31/14
16. Clinical and Translational Science Institute at Children's National (CTSI-CN), NIH. PIs (Jill Joseph, MD; and Peter Hotez, MD). Tarek El-Ghazawi (Associate Director, Biomedical Informatics) (6/10-5/15)
17. Collaborative Research: Development of efficient petascale algorithms for inhomogeneous quantum-mechanical systems. NSF, \$1.5M. Tarek El-Ghazawi (GW PI) (with Freericks [GU] and Saad [UMin]) (9/09-8/13)
18. Unified Parallel C (UPC). Lawrence Berkeley National Lab (LBNL), \$145K. Tarek El-Ghazawi (P.I.). (11/9-7/11).

19. Exploring Multicore and Multi-Paradigm Processing for High-Performance Computing. Arctic Region Supercomputing Center (ARSC), \$535K. Tarek El-Ghazawi (P.I.). (6/07-5/11).
20. US-Egypt Workshop on Software Development for Multicore and Heterogeneous Processors. NSF, \$40K, Tarek El-Ghazawi (P.I.). (2/09-1/11).
21. Exploration of a Research Roadmap for Application Development and Execution on FPGA-based Systems. Wright-Patterson Air Force Research Lab and DARPA, \$350K. Tarek El-Ghazawi (P.I.), Alan George (Co-P.I.). (9/07-6/08).
22. An Infrastructure for a Parallel C: UPC. DoD, \$1.05M. Tarek El-Ghazawi (P.I.). (6/04-7/09).
23. Libraries and Experiments for Reconfigurable Computing Machines. DoD, \$2.95M. Tarek El-Ghazawi (P.I.) Nik Alexandridis, Kris Gaj, Duncan Buell (Co-PIs). (4/02-8/06)
24. Accelerating UPC and High-Performance Reconfigurable Computing for HPC Centers. ARSC/UAFB, \$405K. Tarek El-Ghazawi (P.I.) (6/05-8/07).
25. A Reconfigurable Computing Architecture for On-Board Data Reduction and Cloud Detection. NASA, \$270K. Tarek El-Ghazawi (P.I.). (1/2004-12/2006).
26. Emerging Parallel Architectures and High-Productivity Languages: A Pilot Study. ARSC/UAFB, \$50K. Tarek El-Ghazawi(P.I.).(3/05-5/05).
27. Grid Computing for Authentication of Arabic Text. National Science Foundation, \$25K. El-Ghazawi. (10/2001-9/2003)
28. Parallel Dimension Reduction of Hyperspectral Data. NASA GSFC, \$106K. El-Ghazawi. (7/2001-6/2004)
29. Programming Models for Globally Addressable Memory Architectures (GAMA). DARPA HPCS/SGI, \$200K. Tarek El-Ghazawi (P.I.). (7/02-6/03)
30. IP Tool: Managing Separate Intellectual Property to Support Embedded Systems Design. DoD, \$260K. N. Alexandridis (P.I.) and El-Ghazawi (Co-P.I.). (1/02-8/04)
31. Effective Use of Networked Reconfigurable Resources. DoD, \$325K. Tarek El-Ghazawi (P.I.) Nik. Alexandridis, Kris Gaj, and Brian Schott (Co-PIs). (11/00-10/02)
32. Towards an Efficient Shared Memory Parallel C Standard. DoD, \$391K. Tarek El-Ghazawi (P.I.) and Guy Robinson (Co-P.I.). (1/00-12/02)

33. Grid Computing in the NASA Context. RIACS, NASA Ames Research Center, \$60K. Tarek El-Ghazawi (P.I.). (10/00-8/01)
34. MAPS: Mathematical Applications with a Parallel-Beowulf System. National Science Foundation, \$200K. Tarek El-Ghazawi (Co-PI), with James Gentle (P.I.), Estela Blaisten, Rainland Lohner, John Wallin and and Edward Wegman (Co-PIs). (10/99-9/01)
35. Low-Cost Science Processing with Parallel COTS Technology, NASA Goddard Space Flight Center Distributed Active Archive Center, \$270K. Tarek El-Ghazawi (P.I.). (9/98-6/01)
36. High-Performance Image Processing for Remote Sensing Data. NASA GSFC, \$25K. Tarek El-Ghazawi (P.I.). (10/00-09/01)
37. Kernel and User Level Support Concepts for File System Enhancement. Scyld Computing Corporation, \$17K. Tarek El-Ghazawi (P.I.). (10/99-2/00)
38. Reconfigurable Architectures for On-Board Image Processing. NASA GSFC, \$40K. Tarek El-Ghazawi (P.I.). (4/99-3/00)
39. Parallel Dimension Reduction for Remote Sensing Data. University Space Research Association, \$25K. Tarek El-Ghazawi (P.I.). (4/99-9/00)
40. High-Performance Registration of Synthetic Aperture Radar Data for Soil Moisture Mapping. United States Air Force, Arctic Region Supercomputing Center, \$91K. Tarek El-Ghazawi (P.I.). (1/99-5/00)
41. Video Image Registration on Parallel Clusters. Image Links Inc., \$18K. Tarek El-Ghazawi (P.I.). (1/99-6/99)
42. SIESIP: Seasonal/Interannual Earth Science Information Partner. NASA, \$2.85M. Tarek El-Ghazawi (Senior Investigator), with *Menas Kafatos (P.I.)*. *Other members include COLA, GSFC, and Udel.* (3/98-2/01)
43. High-Performance Implementations of Wavelet-Based Processing for NASA Earth Science Imagery. NASA Mission To Planet Earth (MTPE), through CESDIS/USRA, \$70K. Tarek El-Ghazawi (P.I.). (3/97-5/98)
44. Parallel Wavelet-Based Image Registration on the Beowulf Architecture. NASA GSFC, Code 930, through CESDIS/USRA, \$72,926. Tarek El-Ghazawi (P.I.). (9/96-2/98)
45. PACET: A PC-Parallel Architecture for Cost Efficient Telemetry. *NASA GSFC, Code 500, \$126K.* Tarek El-Ghazawi (P.I.). (1/96-5/98)

46. Understanding and Improving High-Performance I/O Subsystems. *NASA HPCC Basic Research Program through USRA/CESDIS, \$149,950*. Tarek El-Ghazawi (P.I.) and Gideon Frieder (Co-PI). (8/93-9/96)
47. Massively Parallel Telemetry Processing. *NASA GSFC, Code 500, \$152,798*. Tarek El-Ghazawi (P.I.). (1/94-12/95)
48. Experimental Evaluation and Workload Characterization for High-Performance Computer Architectures. *USRA/Center of Excellence in Space Data and Information Sciences, \$86,778*. Tarek El-Ghazawi (P.I.). (1/94-5/95)
49. A Pilot Study on the Parallelization of a Water Quality Model for the Chesapeake Bay. Army Corps of Engineers (subcontract through Computer Science Corporation), with a high-performance computing equipment loan from Silicon Graphics Inc. \$5,000 plus equipment. Tarek El-Ghazawi (P.I.). (3/95-6/95)
50. Parallel Processing Techniques for Level-Zero Processing. *NASA Goddard Space Flight Center, Code 500, \$62,765*. Tarek El-Ghazawi (P.I.). (1/93-12/93)
51. Evaluating Early High-Performance Computing Systems. *USRA/CESDIS, \$26,184*. Tarek El-Ghazawi (P.I.). (6/93-12/93)

INTERNAL FUNDS and Cash Gifts:

**GWU Endowment:** HPC Academic Excellence Signature Program (**\$2 Million plus cost sharing**) (7/06-present)

**GWU CIFF Program:** High-Performance Computing Simulations of the Brain for Neuroscience and Neurorobotics. **\$90K**. (7/14-6/16)

INDUSTRIAL FUNDS RESEARCH GIFTS:

**Unrestricted Cash Gifts (ranged from \$10K to \$250K)** IBM, Intel (GW-Intel Parallel Computing Center ), AMD, Mellanox, KAUST, Microsoft, and Starbridge

Industrial Memberships in my NSF CHREC IUC/RC Center.

**Parallel Computers and Hardware Computer Boards:** Numerous gifts and loans of/from SGI, Intel, Cray, HP, ISI, AMI, ISI, Titera, Xilinx, Altera,

EMPLOYMENT HISTORY:

**Leadership Roles:**

**Director**, Institute for Massively Parallel Applications and Computing Technology (IMPACT), and the GWU High-Performance Computing Academic Signature Program. [4/2007-present]

**Director**, GW Strategic Academic Excellence Program in High-Performance Computing [7/2006-present]

**Director**, Intel Parallel Computing Center at GW (GW-IPCC), May 2015- present

**Director (GW CHREC Center)**, National Science Foundation Industry/University Center for High-Performance Reconfigurable Computing (NSF CHREC), UF/GWU/VaTech/BYU. [12/2006-8/2015]

**Associate Director for Bioinformatics**, Clinical and Translational Science Institute at Children's National (CTSI-CN), NIH. (6/10-5/15)

#### **Academic Positions:**

**Professor:** Department of Electrical and Computer Engineering, The George Washington University, Washington, D.C. (8/2003-present)

**Associate Professor:** (8/2001-6/2003) Department of Electrical and Computer Engineering, The George Washington University, Washington, D.C.

**Associate Research Professor** Department of Electrical Engineering and Computer Science, **The George Washington University**, Washington, D.C. (8/92-8/97) **Visiting**

**Assistant Professor:** (8/90-8/92) **Assistant Professorial Lecturer:** (1/89-8/90)

**Associate Professor of Computational Sciences and Computer Engineering**, School of Computational Sciences, with a courtesy appointment in the Department of Electrical and Computer Engineering, **George Mason University**, Fairfax, Virginia (8/98-8/2001)

**Associate Professor of Computer Engineering and Computer Science, and Director of the Center for High-Performance Information Processing (CHIP)**, Florida Institute of Technology, Melbourne, Florida. (8/97-8/98)

**Assistant Professor:** Department of Computer Science, Frostburg State University, University of Maryland System, Frostburg, Maryland. (8/89-8/90)

**Assistant Professor:** Department of Electronics and Communications Engineering. Helwan University, Cairo, Egypt (8/88-8/89)

#### SHORT-TERM VISITING PROFESSORSHIP

King Abdullah University for Science and Technology (KAUST, SAUDI); Karlsruhe Institute of Technology (Germany); Marseilles III (France); American University at Cairo (Egypt); Abdel Malik Essadi University (Morocco); Mohamed V University (Morocco); Mundiapolis University (Morocco); KSSS (KOREA); Beihang University (China);

#### CONSULTING/EXPERT ACTIVITIES:



- International Business Machines(IBM)
- Arctic Region Supercomputing Center(ARSC)
- Goddard Earth Science and Technology (GEST) Center, NASA GSFC
- Transition Team, President, Tuskegee University
- Center of Excellence in Space Data and Information Science (CESDIS), NASA Goddard Space Flight Center
- Research Institute for Advance Computer Science (RIACS), NASA Ames Research Center
- GMU/Hughes Applied Information Systems
- USC/Information Sciences Institute
- Image Links Inc.
- IRMA
- Several Legal Firms for Expert Witnessing

#### ADVISORY BOARDS:

DSPLogic Technical Advisory Board, Minah Ventures Technical Advisory Board, Arctic Region Supercomputing Center Science Advisory Panel, Advisory Board for the IEEE Task Force on Cluster Computing, OpenFPGA Consortium Steering Committee, Catholic University ECE Department Advisory Board, and UPC Language Consortium. Member of the IEEE Computer Society Fellows Selection Committee.

#### MEDIA INTERVIEWS/QOUTES

- DMC Cairo, Egypt, The 8'Oclock TV Program, Artificial Intelligence and Supercomputing. December 2019.
- Washington Post, Supercomputing Latest Front in US-China High-Tech Battle, June 2019.
- Al Jazeera TV – Life Documentary – Mo3htareboon. October 2017
- Al Nahar TV – Life Documentary - Maser Tastae3. March 2017
- Voice of America- China Division, Interview on Supercomputing and the new Developments in China May, 2016
- Interview with the Washington Post, also appeared in Chicago's Daily Herald, Americans Uneasy about Surveillance. December 2013.
- Interview with IEEE Spectrum, China's Home Grown Supercomputers. January 2012.
- Interview with Sky News TV, UK, on IBM Watson, the Computer that won the Jeopardy game, February 2011.

- Interview with Nile TV IT Show on the NSF Workshop on Multicore, Egypt, December 2010
- Interview with Good Morning Egypt on Supercomputing and New Processing Technologies, TV Channel 1 in Egypt, December 2010.
- China Builds World's Fastest Supercomputer, Interview with IEEE Spectrum Magazine, November 2010
- IBM Reclaims Supercomputer Lead, Interview with IEEE Spectrum Magazine, February 2005

## PUBLICATIONS:

### **Books**

1. T. El-Ghazawi, W. Carlson, T. Sterling, and K. Yelick, UPC: Distributed Shared Memory Programming. John Wiley & Sons Inc., New York, 2005. ISBN: 0-471-22048-5. (May 2005)

### **Book Contributions**

2. Martial Michel, Olivier Serres, Ahmad Anbar, Edmond J. Golden III, Tarek El-Ghazawi. Open Source Private Cloud Platforms for Big Data. In Big Data Analytics for Sensor-Network Collected Intelligence. Academic Press, ISBN: 978-0-12-809393-1. February 2017.
3. O Achahbar, M Abid, M Bakhouya, C El Amrani, J Gaber, M Essaaidi, T El Ghazawi (2015) Approaches for Big Data Processing: Applications and Challenges In: Big Data: Algorithms, Analytics, and Applications Edited by:Kuan-Ching Li, Hai Jiang, Laurence T. Yang, Alfredo Cuzzocrea. Taylor & Francis Group, USA: Chapman & Hall/CRC Big Data Series, CRC Press.
4. E. El-Araby, S. Merchant, and T. El-Ghazawi. Assessing productivity of high-level design methodologies for high-performance reconfigurable computers. In W. Vanderbauwhede and K. Benkrid, editors, High- Performance Computing Using FPGAs, pages 719–745. Springer New York, 2013.
5. E. El-Araby, M. Taher, T. El-Ghazawi, and J. Le Moigne, “Remote Sensing and High Performance Reconfigurable Computing Systems”, in High Performance Computing in Remote Sensing, Editors A. J. Plaza, C.I. Chang, Volume 16, New York, Chapman & Hall/CRC Computer & Information Science Series, 2007, pps. 496. ISBN: 9781584886624, ISBN 10: 1584886625

6. Younis, Yeh, Kyriakopoulos, Alexandridis, and El-Ghazawi. Dependability of Reconfigurable Computing, with M. Younis et al, Chapter 23 in Dependable Computing, Edited by Diab and Zomaya, John Wiley and Sons. October 2005, ISBN 0-471-67422-2
7. T. El-Ghazawi, O. Frieder, J. Gaber, S. Alaoui, "Biologically Inspired Solutions for Task Mapping," in *Biologically Inspired Solutions for Parallel Processing*, edited by A. Zomaya, John Wiley & Sons Inc., New York, 2001. ISBN: 0-471-35352-3.
8. T. El-Ghazawi and G. Frieder, "Input/Output," in *The Encyclopedia of Computer Science*, edited by Anthony Ralston, Edwin Reilly, and David Hemmendinger, Nature Publishing Group, London, 2000. ISBN: 0-333-77879-0.
9. T. El-Ghazawi and G. Frieder, "Redundant Arrays of Inexpensive Disks (RAID)," in *The Encyclopedia of Computer Science*, edited by A. Ralston, E. Reilly, and D. Hemmendinger, Nature Publishing Group, London, 2000. ISBN: 0-333-77879-0.

### Journal Papers

10. E. Kayraklioglu, E. Favry and T. El-Ghazawi, "A Machine-Learning-Based Framework for Productive Locality Exploitation," in *IEEE Transactions on Parallel and Distributed Systems*. (June 2021), doi: 10.1109/TPDS.2021.3051348.
11. S. Sun, M. Miscuglio, X. Ma, Z. Ma, C. Shen, E. Kayraklioglu, J. Anderson, T. El Ghazawi, V. J. Sorger. Induced homomorphism: Kirchhoff's law in photonics. *Nanophotonics*. (March 2021). <https://doi.org/10.1515/nanoph-2020-0655>
12. T. de Lima, A. N. Tait, A. Mehrabian, M. A. Nahmias, C. Huang, H. Peng, B. A. Marquez, M. Miscuglio, T. El-Ghazawi, V. J. Sorger, B. J. Shastri, P. R. Prucnal. Primer on silicon neuromorphic photonic processors: architecture and compiler. *Nanophotonics*. (August 2020). <https://doi.org/10.1515/nanoph-2020-0>
13. Anderson, Kayraklioglu, Sun, Alkabani, Crandall, Sorger, El-Ghazawi. ROC: The Reconfigurable Optical Computer. *ACM Transactions on Parallel Computing*. Vol. 7 Issue 1. March 2020.
14. Yousra Alkabani, Mario Miscuglio, Volker J. Sorger, Tarek El-Ghazawi OE-CAM: A Hybrid Opto-Electronic Content Addressable Memory. *IEEE Photonics Journal*. Volume: 12 , Issue: 2 , April 2020

15. A. Mehrabian, M. Miscuglio, Y. Alkabani, V. J. Sorger, and T. El-Ghazawi. "A Winograd-based Integrated Photonics Accelerator for Convolutional Neural Networks," IEEE Journal of Selected Topics in Quantum Electronics. Published online December 3, 2019.
16. J Anderson, Y Alkabani, T El-Ghazawi. Towards Energy-Quality Scaling in Deep Neural Networks. IEEE Design & Test. Nov. 2019.
17. Zheyi Chen ; Jia Hu ; Geyong Min ; Albert Y. Zomaya ; Tarek El-Ghazawi Towards Accurate Prediction for High-Dimensional and Highly-Variable Cloud Workloads with Deep Learning. IEEE Transaction on Parallel and Distributed Systems. Vol. 13 Issue 4. November 2019.
18. Engin Kayraklioglu, Michael Ferguson, Tarek El-Ghazawi. LAPPS: Locality Aware Productive Prefetching Support for PGAS. ACM Transactions on Architecture and Code Optimizations. Volume 15 Issue 3, October 2018
19. Jiaxin Peng, Shuai Sun, Vikram K Narayana, Volker J Sorger, Tarek El-Ghazawi. Residue number system arithmetic based on integrated nanophotonics. Optics Letters. Vol 43, Issue 9, Pages 2026-2029. Optical Society of America. 05/01/2018
20. Shuai Sun, Vikram K Narayana, Ibrahim Sarpkaya, Joseph Crandall, Richard A Soref, Hamed Dalir, Tarek El-Ghazawi, Volker J Sorger. Hybrid photonic plasmonic nonblocking broadband  $5 \times 5$  router for optical networks IEEE Photonics Journal. Vol 20, Issue 2. Pages 1-12. IEEE. 04/06/2018
21. Shuai Sun, Vikram Narayana, Tarek El-Ghazawi, Volker J Sorger . "High Performance Photonic-Plasmonic Optical Router: A Non-blocking WDM Routing Device for Optical Networks," Photonics in Switching, June 2017
22. Shuai Sun, Vikram Narayana, Tarek El-Ghazawi, Volker J Sorger . "CLEAR-A Holistic Figure-of-Merit for Electronic, Photonic, Plasmonic and Hybrid Photonic-Plasmonic Compute System Comparison," Optical Sensors, June 2017
23. Vikram K. Narayana, Shuai Sun, Abdel-Hameed A. Badawy, Volker J. Sorger, and Tarek El-Ghazawi. "MorphoNoC: Exploring the Design Space of a Configurable Hybrid NoC using Nanophotonics," Microprocessors and Microsystems, Available

- online 11 March 2017, ISSN 0141-9331, <http://dx.doi.org/10.1016/j.micpro.2017.03.006>.
24. Abdel-Hameed Badawy, Gabriel Yessin, Vikram Narayana, David Mayhew, Tarek El-Ghazawi, "Optimizing thin client caches for mobile cloud computing: Design space exploration using genetic algorithms," *Concurrency and Computation: Practice and Experience*. 2017; e4048.
  25. Tikidji-Hamburyan R.A., El-Ghazawi T.A., Triplett J.W., "Novel Models of Visual Topographic Map Alignment in the Superior Colliculus," *PLOS Computational Biology* vol. 12, no. 12 (2016): e1005315.
  26. Lubomir Riha, Jacqueline Le Moigne, and Tarek El-Ghazawi. "Optimization of Selected Remote Sensing Algorithms for Many-Core Architectures." *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* vol. 9, no. 12 (2016): 5576-5587.
  27. Gangotri Dey, Jiawen Ren, Tarek El-Ghazawi, and Stuart Licht. "How does an amalgamated Ni cathode affect carbon nanotube growth? A density functional theory study." *RSC Advances* 6, no. 32 (2016): 27191-27196.
  28. David Newsom, Sardar Azari, Olivier Serres, Abdel-Hameed Badawy, and Tarek El-Ghazawi, "Thread-Level CPU Power Measurement for High Performance Parallel Systems," *International Journal of Computing and Digital Systems*, 2016. Vol 5, Issue 3
  29. Ahmad Anbar, Olivier Serres, Engin Kayraklioglu, Abdel Hamid Badawy, and Tarek El-Ghazawi, "Exploiting Hierarchical Locality in Deep Parallel Architectures". *ACM Transactions on Architecture and Code Optimizations* Volume 13 Issue 2, June 2016.
  30. Olivier Serres, Abdullah Kayi, Ahmed Anbar and Tarek El-Ghazawi, "Enabling PGAS Productivity with Hardware Support for Shared Address Mapping: A UPC Case Study". *ACM Transactions on Architecture and Code Optimizations*. Volume 12 Issue 4, January 2016.
  31. Shuai Sun, Abdel Hamid Badawy, Tarek El-Ghazawi, Volker Sorger, "The Case for Hybrid Photonic Plasmonic Interconnects (HyPPI): A low Latency, Energy and Area Efficient On-chip Interconnects". *The IEEE Photonics Journal*. Volume 7, Number 6, December 2015.

32. Abdullah Kayi, Olivier Serres, and Tarek El-Ghazawi, "Adaptive Cache Coherence Mechanisms with Producer-Consumer Sharing Optimization for Chip Multiprocessors," *IEEE Transactions on Computers*. VOL. 64, NO. 2, pp 316-328. February 2015
33. Abdullah Kayi, Olivier Serres, and Tarek El-Ghazawi, "Bandwidth adaptive cache coherence optimizations for chip multiprocessors," *International Journal of Parallel Programming*, vol. 42, no.3, pages 433–455, June 2014.
34. Suboh Suboh, Vikram Narayana, Mohamed Bakhouya, Jaafar Gaber, Tarek El-Ghazawi, "Methodology for adapting on-chip interconnect architectures," *IET Computers and Digital Techniques*, 8(3). pp 109-117. May 2014
35. Teng Li, Vikram K Narayana, and Tarek El-Ghazawi, "Exploring Graphics Processing Unit (GPU) Resource Sharing Efficiency for High Performance Computing" *Computers*, vol. 2, no. 4. pp. 176-214, Nov 2013.
36. Lubomir Riha, Maria Malik, and Tarek El-Ghazawi, "An Adaptive Hybrid OLAP Architecture with optimized memory access patterns," *Cluster Computing Journal*, Dec. 2012.
37. Lingyuan Wang, Miaoqing Huang, and Tarek El-Ghazawi, "Towards Efficient GPU Sharing on Multicore Processors," *ACM SIGMETRICS Performance Evaluation Review*, vol. 40, no. 2, pp. 119-124, Sept. 2012.
38. Miaoqing Huang, Vikram K. Narayana, Tarek El-Ghazawi, Mohamed Bakhouya and Jafer Gaber, "Efficient Mapping of Task Graphs onto Reconfigurable Hardware Using Architectural Variants," *IEEE Transactions on Computers*, vol. 61, no. 9, pp. 1354-1360, Sept. 2012.
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- 255.S. Kaewpijit, J. Le Moigne, and T. El-Ghazawi, "Spectral Data Reduction Via Wavelet Decomposition," SPIE's OE/Aerospace Sensing, Wavelet Applications IX, Orlando, Apr. 2002.
- 256.S. Kaewpijit, J. Le Moigne, and T. El-Ghazawi, "Hyperspectral Imagery Dimension Reduction Using Principal Component Analysis on the HIVE," Science Data Processing Workshop, NASA Goddard Space Flight Center, Feb. 26-27, 2002
- 257.J. Vongsaard, L. S. Chiu, T. El-Ghazawi, J. Weinman, M. Kafatos, and R. Yang, "The Comparison of the Continuous Tracking of Rain Rate and Reflectivity Data Using Genetic Based Wavelet Image Registration Technique," 3<sup>rd</sup> Plinius Conference on Mediterranean Storms (EGS'01), Baja Sardinia, Italy, Oct. 1-3, 2001.

- 258.F. Salem, M. Kafatos, T. El-Ghazawi, T. Gomez, and R. Yang, "Hyperspectral Image Analysis for Oil Spill Detection," 22nd Asian Conference on Remote Sensing (ACRS'01) Singapore, 5 - 9 Nov. 2001.
- 259.V. Staicu, J. R. Radzikowski, K Gaj, N. Alexandridis, and T. El-Ghazawi, "Effective Use of Networked Reconfigurable Resources," Proc. 2001 MAPLD Int. Conf., Laurel, MD., Sep. 2001.
- 260.S. Kaewpijit, J. Le Moigne, and T. El-Ghazawi, "Finding the Dimensionality of Hyperspectral Data," 2001 SPIE's OE/Aerospace Sensing, Algorithms for Multispectral and Hyperspectral Data VII, Orlando, Apr. 16-20, 2001.
- 261.F. Salem, T. El-Ghazawi, and M. Kafatos, "Remote Sensing and Image Analysis for Oil Spill Mitigation in the Red Sea," International Conference on Earth Observations and Global Information, Cairo, Egypt, Nov. 11-14, 2000.
- 262.J. Vongsaard, L. S. Chiu, and T. El-Ghazawi, "Image Registration Technique for Comparing Precipitation Radar data and Ground Validation data," Progress in Eletromagnetics Research Symposium (PIERS), Cambridge, Massachusetts, July 5-14, 2000
- 263.Christopher Lynnes, Peter Smith, Larry Shotland, Tarek El-Ghazawi, Ming Zhu, "Level 1 Processing of MODIS Direct Broadcast Data," The 4th International Meeting on Direct Broadcast of Earth Observation Data, Dundee, Scotland, June 27-30, 2000.
- 264.J.Gaber, J.Bahi, T.El-Ghazawi and B.Toursel, "Analysis of Randomized on-line load distribution in static network," International Conference on Software Engineering Applied to Networking & Parallel/ Distributed Computing (SNPD'2000), Champagne-Ardenne, France, May 18-21, 2000.
- 265.M. Kafatos, R. Yang, L. Chiu, T. El-Ghazawi, Z. Li, J. McManus, C. Wang, X. S. Wang, H. Weir, and K-S Yang, "Data Access, Querying, and Analysis in a Distributed Data Information Framework Supporting Earth System Science. International Conference on Information Systems Analysis and Synthesis (SCI/ISAS'99 Multiconference), Orlando, July 1999.
- 266.J. Le Moigne, W. Xia, S. Chettri, T. El-Ghazawi, ... et. al, "Towards an Intercomparison of Automated Registration Algorithms for Multiple Source Remote Sensing Data," Image Registration Workshop (IRW'97), Greenbelt, MD., Nov. 1997.
- 267.P. Chalermwat, T. El-Ghazawi, and J. Le Moigne, "Image Registration by Parts," Image Registration Workshop (IRW'97), Greenbelt, MD., Nov. 1997.

268. W. Xia, J. Le Moigne, J. Tilton, B.-T. Lerner, E. Kaymaz, J. Pierce, S. Raghavan, S. Chettri, T. El-Ghazawi, M. Mareboyana, N. Netanyahu, and W. J. Campbell, and R. F. Crompt, "A Registration Toolbox for Multi-Source Remote Sensing Applications," Earth Observations and Environmental Information (EOEI'97), Alexandria, Egypt, Oct. 1997.
269. Meajil and T. El-Ghazawi, "A Framework for Performance Prediction of Parallel Systems Based on Workload Similarity," The Eighth SIAM Conference on Parallel Processing for Scientific Computing, PP '97, Minneapolis, MN., Mar. 14-17, 1997.
270. Ozkaya and T. El-Ghazawi, "An Electrostatic Particle\_In\_Cell (PIC) Simulations on the Intel Paragon," Proceedings of the Parallel and Distributed Computing and Systems, Orlando, Sep. 1995.
271. T. El-Ghazawi, J. Pritchard, and G. Knoble, "Applications of Massively Parallel Computing in Telemetry Processing," Proceedings of SPACEOPS'94, NASA and CCSDS, Greenbelt, MD, Nov. 1994.
272. T. El-Ghazawi, "Performance Evaluation of Early Systems: An HPCC Perspective," Proceedings of the Sixth SIAM Conference on Parallel Processing for Scientific Computing, Norfolk, VA., Mar. 1993.
273. Baig, N. Alexandridis, and T. El-Ghazawi, "Cost and Performance Analysis of Partitionable SIMD/MIMD Architectures," Proceedings of the ISMM International Conference on Computer Applications in Design, Simulation, and Analysis, Orlando, FL., Mar. 1992.
274. Baig, T. El-Ghazawi, and N. Alexandridis, "A Highly Reconfigurable MSIMD/MIMD Architecture," Proceedings of the Fourth ISMM International Conference on Parallel and Distributed Computing and Systems, Washington D.C., vol. II, Oct. 1991.
275. T. El-Ghazawi and G. Flachs, "Design of Pipelined Processors for Optimal Implementation of Difference Equations," Proceedings of the Fourth ISMM International Conference on Parallel and Distributed Computing and Systems, Washington D.C., Vol. II, Oct. 1991.
276. Youssef and T. El-Ghazawi, "Fault Tolerant Routing in Product Networks," Proceedings of the Fourth ISMM International Conference on Parallel and Distributed Computing and Systems, Washington D.C., Vol. II, Oct. 1991.
277. W. E. Thompson, G. M. Flachs, L. Kazda, V. Kittur, and T. El-Ghazawi, "Vision System Control," Proceedings of 19TH Pittsburgh Conference on Modeling and Simulation, Pittsburgh, PA., May 1988.

278. Schleusener, T. El-Ghazawi, R. Black, and R. Blanco, "Analysis of Scanning Recognition Systems Using Windowed Clutter Measurements," Proceedings of the 29th Midwest Symposium on Circuits and Systems, Lincoln, Nebraska, Aug. 1986.
279. Schleusener, T. El-Ghazawi, R. Black, and R. Blanco, "Analog Windowed Clutter Instrumentation," Proceedings of ISE/IEEE Ideas in Science and Electronics, Albuquerque, New Mexico, May 1986.
280. El-Ghazawi and M. D. Merrill, "An Analytical Design of Digital Controllers with Minimum Settling Time," Proceedings of the 28th Midwest Symposium on Circuits and Systems, Louisville, Kentucky, Aug. 1985.

### GRADUATE ADVISING:

#### Doctoral Students Advised

1. Dr. Ahmed Anbar, Productive Exploitation of Hierarchical Locality in Extreme Scale System, December 2016. (Ahmed is now with Amazon Cloud Services). This thesis won the best doctoral thesis award in the department, May 2017.
2. Dr. David K. Newsom, Locality-Driven Power Optimization Techniques for High-Performance Parallel Systems, December 2015. (David is an executive with the World Bank)
3. Dr. Olivier Serres, Hardware Support for Productive Partitioned Global Address Space (PGAS) Programming, December 2015. (Olivier is now with Intel Federal)
4. Dr. Teng Li, Efficient Virtualization and Scheduling for Productive GPU-Based High Performance Computing Systems, May 2015 (Dr. Li is now with Facebook).
5. Dr. Abdullah AlDahlawi, Design Space Exploration and Management Policies for Locality-Aware Hybrid Storage Architectures, August 2012. (Dr. AlDahlawi is now directing the IT Center for the Saudi DoD)
6. Dr. Abdullah Kayi, An Efficient Cache Coherence Mechanism for Chip Multiprocessors. June 2011. (Dr. Kayi was Intel Corporation Future Technology Group and moved recently to IBM Research)
7. Dr. Esam El-Araby. Virtualizing and Sharing Resources in High-Performance Reconfigurable Computing Architectures. July 2010. (Dr. El-Araby is an Assistant Professor in Kansas University, Dept. of Electrical Engineering and Computer Science)
8. Dr. Suboh Suboh. Towards an Adaptive Interconnect for System-on-Chip. May 2010. (Dr. Suboh is an Assistant Professor at University of Central Florida)
9. Dr. M. Q. Huang. Mapping and Scheduling Hardware Tasks on High-Performance Reconfigurable Architectures. August 2009. (Dr. Huang is an Assistant Professor with University of Arkansas, Dept of Computer Science and Engineering)



10. Dr. Proshanta Saha Application Hardware/Software Co-Design for Reconfigurable Computing Systems, Defended March 2008. (Dr. Saha is with IBM TJ Watson Research Center)
11. Dr. Mohamed Taher, D.Sc. in Computer Engineering, Thesis Title: Exploiting Processing Locality for Adaptive Computing Systems, September 2006. (Dr. Taher is an Associate Professor with Ain Shams University and consults for Mentor Graphics)
12. Dr. Abdullah Almojel: An Architecture-Independent Workload Characterization Model for Parallel Computer Architectures, GWU, April 1997. (Dr. Almojel was Deputy Minister for Higher Education and the VP for Development in KAUST University, recently leading a start up)
13. Dr. Prachya Chalermwat: High-Performance Automatic Image Registration GMU, November 1999. (Dr. Chalermwat is an Associate Professor with the Computer Science Department at the Thai Royal Military Academ)
14. Dr. Nazil Goharian: A Sparse Matrix Approach for Information Retrieval, FIT, April 2001. (Dr. Goharian is a Professor with the Computer Science Department at Georgetown University)
15. Dr. Jearanai Vongsaard: Automatic Morphing Using Image Registration: Applications to Continuous Tracking of Radar Reflectivity and Rain Fields, GMU, April 2002. (Dr. Vongsaard is an Associate Professor with the Computer Science Department at the Thai Royal Military Academy)
16. Dr. Sinthop Kaewpijit: High-Performance Dimension Reduction of Hyperspectral Data, GMU, August 2002. (Dr. Kaewpijit is an Army Major, Project Engineer/The Battalion of Engineers, Thailand)

#### M.S. Theses

1. Lingyuan Wang: Exploring Hierarchical Parallelism Using UPC. August 2010. (Startup).
2. John Harkins: Improving High-Performance Reconfigurable Architectures: A Sorting Case Study, December 2005 (with US Gov)
3. Smita Anareddy: Adaptive Programming-Model-Based Load-balancing Environment (APLE), GWU, January 2005 (with Microsoft)
4. Esam El-Araby: A System Level Design Life Cycle for Reconfigurable Computing Applications, GWU, January 2005 (Ph.D. in 2010, now Assistant Pof. At KU)
5. Francios Cantonnet : Compiler Optimizations for Distributed Shared Memory Languages. GWU, December 2003 (Microsoft)
6. Esmail Chitwala : Benchmarking of Recofigurable Computing Systems. GWU, May 2004 (Hughes Network Systems)

#### PROFESSIONAL SERVICE:

##### Editorial Boards:

- Associate Editor, IEEE Transactions on Parallel and Distributed Systems, 2016-present.
- Associate Editor, IEEE Transactions on Computers, 2006-2012
- Guest Co-Editor, IEEE Computer, Special Issue on High-Performance Reconfigurable Systems (March 2007)
- Associate Editor, Int. Journal of Parallel and Distributed Systems and Networks, 98-01
- Guest Co-Editor, IEEE Concurrency, Track on High-Performance Data Mining, 99-00.

Government Research Funding Selection Panels and Reviews:

- National Science Foundation
- AFOSR
- DoD HPCMOD
- DoE Office of Science
- NASA Headquarters
- Qatar Foundation

Technical Conference Activities:

**Technical Conference Leadership**

- General Chair, The 18<sup>th</sup> IEEE/ACM International Symposium on Cluster, Cloud, and Grid Computing. CCGRID2018. Washington DC, May 2018.
- General Chair, The IEEE 19th International Conference on High-Performance Computing and Communications (HPCC2017), Bangkok, December 2017
- General Chair, The IEEE 15th International Conference on Smart City (SmartCity2017), Bangkok, December 2017.
- General Chair, The IEEE 3rd International Conference on Data Science and Systems (DSS2017), Bangkok, December 2017.
- General Chair, IEEE International Conference on Advanced Cloud and Big Data, Chengdu, China. August 13-14, 2016.
- General Chair, Cloud Computing Technology and Applications, Marrakech, Morocco, May 24-26, 2016.

- Chair, Steering Committee, Partitioned Global Address Space Programming Paradigms Conference.
- General Chair, IEEE Partitioned Global Address Space Programming Paradigms Conference 2015. September 16-18, Washington DC.
- Technical program chair (TPC) of the 17th IEEE International Conference on High Performance and Communications (IEEE HPCC 2015), August 24-26, New York, USA.
- General Chair, The 24th IEEE International Conference on Application-specific Systems, Architectures and Processors. Washington DC, June 2013.
- General Chair, International Conference on New Technologies, Mobility and Security, NTMS 2011, Paris, February 2011
- General Co-Chair, International Symposium on Applied Reconfigurable Computing, Belfast, March 2011.
- General Chair, ACS/IEEE International Conference on Computer Systems and Applications, AICCSA 2011, Sharm El-Sheikh, June 2011.
- General Co-Chair, High-Performance Reconfigurable Computing Technology and Applications Workshop, New Orleans, November 2010.
- General Chair, The 10th IEEE International Conference on Scalable Computing and Communications (ScalCom-10), Bradford, UK, June 29-July 1, 2010.
- General Chair, The 10th IEEE International Conference on Computer and Information Technology (CIT-10) Bradford, UK, June 29 – July 1, 2010.
- Program Chair, International Symposium on Applied Reconfigurable Computing, Bangkok, March 2010.
- General Chair, Partitioned Global Address Space Programming Paradigms Conference Washington D.C., October 2009
- General Co-Chair, High-Performance Reconfigurable Computing Technology and Applications Workshop, Portland, November 2009.
- Program Chair, International Conference on Field Programmable Technology (FPT), Taipei, December 2008
- Program Co-Chair, High-Performance Reconfigurable Computing Technology and Applications Workshop, Seattle, November 2008.
- Program Co-Chair, High-Performance Reconfigurable Computing Technology and Applications Workshop, Reno, November 2007.
- Chair, Partitioned Global Address Space Programming Paradigms Conference (PGAS2006), Washington D.C., October 2006.
- Workshops chair for the Frontiers of the Massively Parallel Computation. Sponsored by the IEEE, IEEECS and NASA. Mclean, VA, February 1995.
- To keep space limited, technical program committee memberships are not included

Technical Reviewing/Refereeing:

Served as a referee for textbooks and research papers in Parallel Processing and Computer Architecture for many organizations including:

- John Wiley
- West Publishing

- WCB Publishers
- The IEEE Transactions on Computers
- The IEEE Transactions on Parallel and Distributed Systems
- The IEEE Geosciences and Remote Sensing
- Journal of Parallel and Distributed Computing
- Journal of Computers and Software Engineering
- The Journal of Computers
- Many other publishers and IEEE/ACM major conferences
- Refereed research proposals submitted to NASA and NSF

#### Sample Keynote, Invited and Plenary Presentations

- Keynote, New Paradigms for Energy-Efficient Computing Beyond the Moore's Law Era. IEEE International System On Chip Conference (IEEE SOCC 2018). Crystal City, September 5-7, 2018.
- Keynote, Seeking Transformative Processor Paradigms for the Post-Moore's Law Era. IEEE International Conference on High-Performance Computing and Communications. Exeter, the U.K. June 29, 2018.
- Seminar, Post-Moore's Law Nanophotonic Processors: Alternative Architectures, Potential and Challenges. Laboratory of Physical Sciences/NSA, Maryland. March 23, 2018.
- Seminar, Pioneering Directions for Future Processing with Nanophotonics: From Adaptive Hybrid NoCs to Atto-Joule Computing, The DoD Basic Research Forum, The Basic Research Office at the Office of the Assistant secretary of Defense for Research and Engineering, ASD(R&E). November 21, 2017
- Keynote, Rebooting Computing- The Search for Post-Moore's Law Breakthroughs, Exeter, June 2017 at the joint conferences:
  - The 10th IEEE International Conference on Cyber, Physical and Social Computing (CPSCoM-2017) <http://cse.stfx.ca/~CPSCoM2017/>
  - The 13th IEEE International Conference on Green Computing and Communications (GreenCom-2017) <http://cse.stfx.ca/~GreenCom2017/>
  - The 10th IEEE International Conference on Internet of Things (iThings-2017) <http://cse.stfx.ca/~iThings2017/>
  - The 3rd IEEE International Conference on Smart Data (SmartData-2017) <http://cse.stfx.ca/~SmartData2017/>

- Keynote, HPC – Exascale and Beyond: The Roadblocks and the New Opportunities. The IEEE 18th International Conference on High-Performance Computing and Communications (HPCC2017), Sydney, December 2016
- Invited Talk, Brain Related Processing: A HPC Perspective Tour and Thoughts, ISC Connection Workshop. Frankfurt, June 2017.
- Tarek El-Ghazawi, “Hardware-Support, Hierarchical Locality and Nano-Photonics: Directions for Productive Extreme Computing.” Office of Science. DoE. Germantown, MD. November 2015.
- Tarek El-Ghazawi, “From Exploiting Hierarchical Locality for Extreme Computing to Next Generation NoCs,” Laboratory for Physical Sciences/NSA, May 18, 2015
- Tarek El-Ghazawi, When HPC, Big Data Science, and Wireless Technology Merge: The world of Endless Opportunities and Challenges, Keynote at the Asia Pacific Conference on Service Computing. Bangkok, December 8-10, 2015.
- Tarek El-Ghazawi, Exploiting Hierarchical Locality for Productive Extreme Computing, Keynote address at the IEEE International Conference on High-Performance Computing and Communications. New York, August 24-26, 2015.
- Tarek El-Ghazawi, Simulations with Heterogeneous High-Performance Computer Systems: Issues and Advances, Keynote address at the 6th International Conference on Computer Modeling and Simulation (ICCMS) 2015, Amsterdam, Netherlands, February 12-13, 2015.
- Tarek El-Ghazawi, “CS Seminar Series: Exploiting Hierarchical Locality with PGAS for Productive Extreme Computing,” King Abdullah University of Science and Technology (KAUST), March 1, 2015.
- Tarek El-Ghazawi, “Mobile Cloud Computing,” International Conference on Cloud Computing Technology and Applications (CLOUDTECH) 2015, Marrakesh, Morocco, June 2-4 2015.
- Preprocessing Big Data with Heterogeneous Hardware. Keynote at HPC China 2013 Big Data Forum, Oct 29-30, 2013.
- The Next 20 Years of Reconfigurable Computing. Presentation at Reconfigurable Architectures Workshop (RAW 2013) Panel, held in conjunction with IPDPS’13, in Boston, May 20-21, 2013.

- Analyzing Big Data and Crunching Large Scale Simulations at Speed- The Advances in High-Performance Computing. Keynote talk at Interface 2013 Symposium at Chapman University, Orange, California, April 4, 2013.
- Advances in High-Performance Computing: The Race to the Top. Colorado State Univ., ISTE C (Informations Sciences and Technology Center, CSU) Distinguished Lecture in conjunction with the Electrical and Computer Engineering Department and Computer Science Department Seminar Series. Feb 18, 2013.
- Making Heterogeneity a First Class Citizen. Colorado State Univ., Electrical and Computer Engineering Department and Computer Science Department Special Seminar Sponsored by ISTE C (Informations Sciences and Technology Center, CSU), Feb 18, 2013.
- Future Directions in High-Performance Computing: Cloud, Datacenters, and Dedicated Systems what are the issues? Presentation at Panel discussion in IEEE International Symposium on Signal Processing and Information Technology, Dec 12-15, 2012 Ho Chi Minh City, Vietnam.
- Mobile Cloud Computing – Opportunities and Challenges. Keynote at International Conference on Complex Systems (ICCS) 2012, Nov 5-6 2012, Agadir, Morocco.
- Advances in Supercomputing - International Workshop on Information Technologies and Communications, Casablanca, November 2011.
- Embracing Heterogeneity in High-Performance Computing, Keynote Address: International Conference on High Performance Computing and Simulation, Istanbul, Turkey, July 6, 2011.
- The Challenges of Computing with FPGAs, Reconfigurable Architectures Workshop, Keynote Address: held in conjunction with the International Parallel and Distributed Processing Symposium, Anchorage, Alaska, May 17, 2011.
- Multimedia Processing Meets High-Performance Computing, Keynote Address: International Conference of Multimedia Computing and Systems, Ouarzazate, Morocco, April 8, 2011.
- PGAS Programming in UPC, Spring School, Tutorial: organized by the Partnership for Advanced Computing in Europe (PACE), at University of Edinburgh, UK. Edinburgh, March 30, 2011.
- Parallel Programming for Multicore and Parallel Computers, Invited Talk: Abdelmalek Essadi University, Tangier, Morocco (Sponsored by the Fulbright Commission and AEU), March 14, 2011.

- Advances in High-Performance Computing, Invited Talk: Abdelmalek Essadi University, Tangier, Morocco (Sponsored by the Fulbright Commission and AEU), March 10, 2011.
- Towards Ease-of-Use and Portability for Heterogeneous Accelerated High-Performance Computing, Invited Talk: A Case Study. US AFOSR-Computational Math Review, Arlington, VA July 2010.
- Computing with FPGAs: Where does it stand and what is next? Keynote Address: FPGA World, Copenhagen, September 2010.
- Towards Ease-of-Use and Portability for Heterogeneous Accelerated High-Performance Computing: A Case Study. AFOSR Computational Math Review, Invited Talk: July 2010.
- The Programmer Productivity Challenges in Modern Computing (Distinguished Visiting Professor Lecture), Invited Talk: American University at Cairo (AUC). April 2010.
- Advances in High-Performance Computing. (Distinguished Visiting Professor Lecture), Invited Talk: American University at Cairo (AUC). April 2010.
- Programming with the PGAS Programming Model. (Distinguished Visiting Professor Lecture), Invited Talk: American University at Cairo (AUC). April 2010.
- The Ubiquity of High-Performance Computing: In Search of Unifying Solutions. Invited Talk: DARPA IPTO Distinguished Lecturer Series. July, 2009.
- The Ubiquity of High-Performance Computing: In Search of Unifying Solutions. Invited Talk: DoD High-Performance Computing Modernization Program Office. July, 2009.
- High-Performance Computational Science with Hardware Accelerators: Challenges and Potential Solutions. Invited Talk: GaTech and AFRL. August, 2009.
- The Ubiquity of High-Performance Computing: In Search of Unifying Solutions. Invited Talk: IBM Research- Arlington Research Lab. March 2010.
- The Challenges of Hardware Accelerated Computations. Invited Talk: Office of the Secretary of Defense and GMU. September 2009.
- The Ubiquity of High-Performance Computing: In Search of Unifying Solutions.

Invited Talk: DoD. September 2009

- The Case and Hurdles for High-Performance Reconfigurable Computing. Invited Talk: DoD. July 2009.
- Computing with Manycores and Heterogeneous Processors: The Productivity Challenges. IFIP 2009 International Conference on New Technologies, Mobility and Security (NTMS'09) Keynote Address: Cairo, December 2009.
- Programming in the PGAS Model, IEEE/ACM Supercomputing, Tutorial: Portland, November 2009.
- Programming in the PGAS Model, IEEE Cluster, Tutorial: New Orleans, August 2009.
- Programming in the PGAS Model, PACT'09, Tutorial: Raleigh, September 2009.
- Do Not Ask What FPGAs Can Do for HPC, Ask What HPC Can Do for FPGAs. Xilinx Corporation, Invited Talk: Santa Clara, January 2009.
- Programming in UPC. The National Security Agency, Invited Talk: Ft Meade, April 2009.
- The Potential for High-Performance Reconfigurable Computing. HPC Users' Forum, Invited Talk: Roanoke, April 2009.
- The Software Challenges of Heterogeneous Multicore Processors: Lessons from High-Performance Computing. International Forum on Multicore Technology, Keynote Address: Cairo, November 2008.
- Advances in High-Performance Computing. IEEE International Conference on Computer Engineering and Systems (ICCES'08) Keynote Address: Cairo, November 2008.
- The Ubiquity of High-Performance Computing. IFIP 2008 International Conference on New Technologies, Mobility and Security (NTMS'08) Keynote Address: Tangier, November 2008.
- Programming in the PGAS Model, IEEE/ACM Supercomputing, Full Day Tutorial: Austin, November 2008.
- Panel Moderator- Software Challenges for Heterogeneous Multicore Processors, IEEE/ACM Supercomputing, Invited Talk: Austin, Nov 2008. Distinguished Panelists (David Patterson – UCB, Mark Snir – UIUC, David Bader- Georgia Tech,



Vivek Sarkar- Rice).