Vita of Rami G. Melhem
Department of Computer Science
The University of Pittsburgh
(412)-624-8426, melhem@cs.pitt.edu

EDUCATION:

1983	Ph.D.	Computer Science, University of Pittsburgh
1981	M.A.	Mathematics, University of Pittsburgh
1981	M.S.	Computer Science, University of Pittsburgh
1978	B.S.	Mathematics, Ein-Shams University, Cairo, Egypt
1976	B.S.	Electrical Engineering, Cairo University, Egypt

PROFESSIONAL EXPERIENCE:

2020-	Emeritus Professor of Computer Science, University of Pittsburgh
1995-2020	Professor of Computer Science, University of Pittsburgh
2000-2009	Chair of the Computer Science Department, University of Pittsburgh
1993-2018	Associate Professor and Professor of Electrical and Computer Eng., University of Pittsburgh
1986-1995	Assistant/Associate Professor of Computer Science, University of Pittsburgh
1985-1986	Visiting Assistant Professor of Mathematics, University of Pittsburgh
1984-1987	Assistant Professor of Computer Science, Purdue University (on leave 9/85 to 6/87)
1984	Research Associate, University of Pittsburgh (January-September)

HONORS:

Fellow of the Institute for Electrical and Electronic Engineering, IEEE (2000 -).
The University of Pittsburgh Provost Award for Excellence in Mentoring (2012).

RESEARCH INTERESTS:

High Performance Computing and Architecture, Power-aware Computing, Fault-tolerant and Real-time Systems, Optical Interconnection Networks and Wireless and Sensor Networks.

GRANT AWARDS:

PITT:	P*ersonalizing Computer Science Courses through Customized Tracks* $9,900, February 2018 – June 2019.
NSF:	*SPX: Enabling Scalable Synchronizations for General Purpose GPUs* With J. Yang, $850,000, October 2017 – September 2021.
QNRF:	*Scalable Analytics Engine for Big Graphs on the Cloud* With M. Hammoud (CMU-Qatar), $269,395 to U. Pitt, December 2015 – May 2019
DOE:	*Lazy Shadowing - An Adaptive, Power-Aware Resiliency Framework for Exascale Computing.* With T. Znati, $964,435, July 2015 – June 2019.
Samsung:	*Constructing Scalable, Energy Efficient and Reliable Main Memory with STT-MRAM*, With A. Jones, $276,755, February 2014 – June 2016.
Samsung:	*Designing and Optimizing Hybrid Main Memory Architectures*. $123,072, March 2013 – February 2014.
NSF:	*Exploratory research on Scalable Resiliency through Shadow Computing and Differential Data Replication.* With T. Znati, $299,800, January 2013 - December 2015.
NSF	*Tackling the Variations and Instability of Nanophotonic Interconnection Networks via Architecture Techniques.* With J. Yang, $130,000, August 2012 – July 2014
NSF:	*Compiler and Chip Multiprocessor Co-design for Scalable Efficient Data Access and Communication.* With A. Jones and S. Cho, $800,000, March 2011 – March 2017
NSF:	*Planning for an Innovative Dual-Path Computer Architecture Modeling Infrastructure for Highly Productive System Simulation and Emulation,*

With S. Cho and A. Jones, $100,000, February 2011 – January 2012

NSF: *CSR: Large: Storage Class Memory Architecture for Energy Efficient Data Centers,*
With B. Childers, S. Cho, D. Mosse, J. Yang and Y. Zhang,
$1,912,127, July 2010 – June 2016

NSF: *Tera-PCM: A Low-Power Terabyte Main Memory using Phase Change Memory*,
With B. Childers and D. Mosse, $300,000, August 2008 – July 2011.

Intel: *A Collaborative Compiler/OS Approach to CPU and Memory Power Management,*
Research Gift. $120,000, May 2007 – April 2009.

NSF: *Designing Resilience for Communities at Risk: Decision Support for Collective Action Under Stress,*
With L. Comfort, T. Znati and D. Mosse. $734,995, September 2007 – August 2012.

NSF: *Enabling Circuit Switching with Compiler Analysis for High Performance Systems*,
With A. K. Jones. $325,000, May, 2007 – April 2010.

NSF: *Workshop on Research Challenges in Dynamic Data Driven Application Systems,*
$40,000, October 2006 – September 2009.

DOE: *Innovative Technology for Virtual Leased-Line Services for High-Speed Networks,*
STTR with T. Znati, $59,500.00, July 2006 – March 2007.

NSF: *Fault-Tolerant and Secure Infrastructure for Time-Critical Embedded Systems,*
With D. Mosse and T. Znati, $250,006.00, Sept. 2005 - August 2009.

Lockheed-Martin/DARPA: *Polymorphous Cognitive Agent Architecture,*
$250,000. Sept. 2004 – Aug. 2006.

NSF: *A Secure Critical Information Technology Infrastructure for Disaster Management,*
With D. Mossé and L. Comfort. $2,800,000.00. Sept. 2003 - Sept. 2009

IBM/DARPA: *Productive, Easy-to-use, Reliable Computing Systems - Phase II,*
1,035,000.00. Aug. 2003 - July 2006.

NSF: *Power Autonomous Wireless Networks with Rechargeable Capabilities,*
With Daniel Mossé. $200,000.00. Oct. 2002 - Aug. 2005

BAE Systems: *Awareness and Management of Power for Space,*
$430,000.00. July 2002 - December 2004

IBM/DARPA: *Productive, Easy-to-use, Reliable Computing Systems,*
$105,000.00. July 2002, - June 2003

NSF: *Secure Virtually Isolated Networks to Avoid & Tolerate Denial of Service,*
With D. Mossé. $300,000.00. Sept. 2001, Sept. 2004

DARPA: *Power Management for Real-time Systems,*
With D. Mossé and M. Elnozahi. $1,604,100.00. Aug. 2000 - June 2004

Computerm: *Fault Tolerance and Scalability in I/O Communication Systems,*
With H. Chuang, D. Mossé and T. Znati. $43,697.00. Jan. 98 - Dec. 98

DARPA: *Fault Tolerance through Scheduling in Real-Time Systems*,
With D. Mossé and N. Suri. $1,637,092.00. Sept. 1996 - August 2000

NSF: *Time Division Multiplexing of Optical Interconnection Networks*,
$187,017.00. September 1996 - August 1999

NSF: *Travel Support for Minority Faculty and Students to MPPOI '95,*
With E. Schenfeld. $7,680.00. October 1995 - September 1996

NSF: *Formation of Galaxies and Large-Scale Structures in the Universe,*
An HPCC Grand Challenge project (Princeton, UIUC, MIT, IU, PSC, PITT).
The budget for U. of Pittsburgh is $125,345.00. Nov. 1993 - April 1997

Mellon Corp: *Applying Massive Parallelism to Large Scientific Programs*,
$75,133.00. June 1993 - September 1995

AFOSR: *Reconfigurable Opto/Electronic Multiprocessor Interconnection Structures*,
With D. Chiarulli and S. Levitan. $528,439.00. Nov. 1992 - Nov. 1995

HP Labs: *Real-time Protocols for Multimedia Applications,*
With T. Znati and R. Sclabassi. $28,218.00. May 1992 - Sept. 1993

NSF: *CISE Research Instrumentation grant for the acquisition of an Intel Hypercube,*
With M.L. Soffa and T. Znati. $124,300.00. March 1990 - March 1991

AFOSR: *Coincident Pulse Techniques for Hybrid Optical-Electronic Computer Systems,*
With D. Chiarulli and S. Levitan. $479,511.00. August 1989 to July 1992

NSF: *Optical Technology in Network Based Multiprocessors,*

With D. Chiarulli and S. Levitan. $49,983.00. July 1989 - June 1990

NSF: *Bi-level Reconfigurations of Fault Tolerant Arrays in Bi-modal Environments*, $61,547.00. September 1989 - August 1991

AFOSR: *Parallel Memory Addressing Using Coincident Optical Pulses*, With D. Chiarulli and S. Levitan. $50,132.00. July 1988 - July 1989

ONR*:* *Application of Computational Networks and Systolic Arrays to Scientific Computation*, With W. C. Rheinboldt. $233,402.00. June 1985 – Sept. 1988

AFOSR: *Computational Fluid Dynamics at the Institute for Comp. Math & Applications*, Investigator (C. Hall and T. Porsching, PIs). $587,858.00. June 1984 - June 1987

PATENTS:

"An Optical Selector Switch," Co-inventors: D. Chiarulli and S. Levitan. Patent # 4,883,334 (1989).

"Recursively Determined Invertible Set Approach to Correct Multiple Stuck-at Faults in Rewritable Memory," Co-inventor: S. Cho. Patent # 9235465 (2016).

"Method and Apparatus for Replacing Data from Near to Far Memory over a Slow Interconnect for Oversubscribed Irregular Applications; Int'l. Appl. No. PCT/US2020/028696," Co-inventors: D Ganguly, J. Yang and Z. Zhang.

"Method and Apparatus for Adaptive Page Migration and Pinning for Oversubscribed Irregular Applications; Int'l. Appl. No. PCT/US2020/028717," Co-inventors: D Ganguly, J. Yang and Z. Zhang.

STUDENT ADVISING:

MS degrees: Kenrick Fernandes(2019), Hani Salib(2014), Ahmed Abousamra(2012), Michel Hanna(2009), Sameh Gobrial(2007), Jianguo Huo(2007), Ruibin Xu(2007), Cosmin Rusu(2006), Sherif Khattab(2004), Nevine Aboughazaleh (2003), Dakai Zhu(2001), Jing Chen(2000), Shu Li(2000), Jin Qian(2000), Deepika Balakrishna(1999), Frank Liberato(1999), Kannan Narayanan(1999), Jun Yang(1999), Abhi Abhishek(1998), Zhixiong Chen(1997), Joydeep Sen Sarma(1997), Chiming Chang(1996), Bohr He(1995), Xin Yuan(1995), Adefemi Sunmonu(1994), Sunondo Ghosh(1993), Steven Lu(1993), Chun Gong(1992), Wei-ming Lin(1991), Robert Beck (1989), Nimish Shrivastava(1989), John Ramirez(1989), Saurabh Gupta(1988), Foster Provost(1988), Padma Venkataraman(1988), Joseph Villani(1988), John Davis(1987), Xiolin Zang(1987).

PhD degrees: Mohammad Mofrad (2020), Debashis Guanguly (2020), Zaeem Hussain(2020), SeyedMohammad SeyedzadehDelcheh(2018), Jiwei Liu(2018), Xialong Cui(2017), Juyoung Jung(2016), Rakan Maddah(2015), Yu Du(2015), Miao Zhu(2015), Michael Moeng(2015), Ahmed Abousamra(2013), Michel Hanna (2013), Yong Li(2012), Shuyi Shao(2010), Mahmoud Elhaddad(2010), Mohamed Hammoud(2010), Ruibin Xu(2010), Sherif Khattab(2008), Nevine AbouGhazaleh(2008), Sameh Gobriel(2008), Cosmin Rusu(2006), Dakai Zhu(2004), Hakan Aydin(2001), Libin Dong(2001), Sylvain Lauzac(2000), Charles Salisbury(1998), Xin Yuan(1998), Nimish Shrivatava(1997), Sunondo Ghosh(1996), Chun Gong(1995), John Ramirez(1995), Chunming Qiao(1993), Sultan Alam(1991), Zincheng Guo(1991).

PROFESSIONAL ACTIVITIES:

Editor:
- IEEE Transactions on Sustainable Computing (2016 - 2020)
- IEEE Transactions on Computers (1991 - 1996 and 2011 - 2014)
- Sustainable Computing, Informatics and Systems (2010 - 2015)
- Journal of Parallel and Distributed Computing (2003 - 2011)
- Computer Architecture Letters (2001 - 2010)
- The International Journal of Embedded Systems (2004 - 2009)
- IEEE Transactions on Parallel and Distributed Systems (1998 - 2002)
- Springer Book Series in Computer Science (1997 - 2009)

Conference Chair: Int. Conf. on Massively Parallel Proc. Using Optical Interconnections (MPPOI) - 1996

Program Committee Chair: Int. Conf. on Parallel and Distributed Comp. & Sys. - 1992

Program Committee Member:
- Int. Conf. on Distributed Computing Systems (ICDCS) – 1997, 2010, 18, 19
- The International Green and Sustainable Computing Conference (IGSC) – 2015, 16, 18
- IEEE Non-Volatile Memory Systems and Applications Symposium (NVMSA) 2017

IEEE Symp. on High-Performance Interconnects (HOTi) - 2006,07,08,09,10,11,12,13,14,15,16,17,19,20
IEEE Int. Symposium on Parallel and Distributed Processing with Applications (ISPA) – 2016, 17
IEEE International Conference on High Performance Computing (HiPC) – 2009, 12, 14, 15, 16
The Design Automation Conference (DAC) – 2016
The IEEE International Conference on Big Data and Cloud Computing (BDCloud) – 2014, 15
The Int. Conf. on Parallel Architectures and Compilation Techniques (PACT) – 2014, 15
The IEEE Int. Conf. on Parallel and Distributed Systems (ICPADS) – 2014, 15
The International Parallel and Distributed Processing Symposium (IPDPS) – 2001, 13, 14
The International Green Computing Conference (IGCC) – 2010, 11, 13, 14
The Int. conference on Supercomputing (SC) – 2004, 07, 08, 13
The International Conference on Cloud and Green Computing (CGC) – 2011, 12
The International Conference on Parallel Processing (ICPP) – 1997, 98, 2000, 06, 08, 11, 12
The GLOBECOM Optical Networking and Systems Symposium – 2002, 07, 10, 11
The International Conference on Data Communication Networking (DCNET) – 2010, 11
The International Forum on Next Generation Multicore/Manycore Technologies (IFMT) - 2010
The International Conference on High-Performance Clustered Computing (LCI) - 2010
IEEE Int. Workshop on Time Critical Applications (IWTCA) - 2009
BROADNETS Optical Networking Symposium – 2004, 05, 06, 07, 08, 09
The ACM Conference on Embedded Systems Software (EMSOFT) - 2008
The International Conference on Principles of Distributed Systems (OPODIS) - 2007
Int. Workshop on Service, Security and Data management for Ubiquitous Computing, 2007
IEEE Int. Symposium on High Performance Computer Architecture (HPCA) – 1997, 2007
Int. Conf. on Self-Organization and Autonomic Systems in Comp. and Comm. (SOAS) - 2006
The 2nd IEEE Symposium on Dependable Autonomic and Secure Computing (DASC) – 2006
The International Conference on Autonomic Computing (ICAC) – 2006
IFIP Workshop on Trusted and Autonomic Ubiquitous and Embedded Systems - 2005
The International Conference on Dependable Systems and Networks (DSN) - 2004
The International Workshop on Methodologies in Low Power Design (MLPD '04) - 2004
The Real-time Systems Symposium (RTSS) - 2004
The Int. Conference on Communications (ICC) Optical Networking Symposium - 2003
The Optical Networking and Communications Conference (OptiComm) - 2003
The 6th International Conference on Computer Science and Informatics (CS&I) - 2002
The International Conference on Communications in Computing (CIC) - 2001 and 02
ICPP workshop on Optical Networks - 2001 and 2002
IEEE International Symposium on Network Computing and Applications (NCA) – 2001
IEEE International Symposium on Signal Processing and Information Technology - 2001
IPPS/IPDPS Workshop on Optics and Computer Science (WOCS) - 2001, 1999, 98, 97
Real-Time Application Symposium (RTAS) - 2001
International Conf. on Parallel Interconnections - 2000
IPPS/IPDPS Workshop on Advances in Parallel & Dist. Computational Models - 2000
10th International Conference on Computing and Information (ICCI) - 2000
Comm. Networks and Dist. Sys. Modeling and Simulation Conf. – 2000, 1999, 97
ISPAN Workshop on Advances in Parallel Computing Models - 1999
International Conf. on Computer Comm. and Networks (IC3N) - 1998
Int. Conf. on Parallel and Dist. Comp. Sys. - 1998, 97, 96, 95, 94, 93, 91
SRDS Workshop on Advances in Parallel and Distributed Systems - 1998
Int. Conf. on Application Specific Array Processors – 1995, 94, 93, 91
Int. Conf. on Massively Parallel Proc. Using Optical Interconnects (MPPOI) - 1995
Int. Workshop on Defect/Fault Tolerance in VLSI - 1995, 93, 92
Int. Symp. On High Performance Distributed Computing - 1993

Advisory Committee Member:

IASTED Conf. on Parallel and Dist. Comp. and Sys. (PDCS '99)
IEEE Technical Committee on Computer Architecture (1994 -2006)
The Microelectronic System Research Center at West Virginia University (1993-97)
IEEE Technical Committee on Parallel Processing (1993 - 96)
The CS&E Department at Hong Kong U. of Science and Technology (2009-2013)

Executive Committee Member: IEEE Parallel Processing Technical Committee (1999 -2005)

PUBLICATIONS IN REFERRED CONFERENCE PROCEEDINGS:

1) X. Tang, Z. Zhang, W. Xu, M. Kandemir, R. Melhem and J. Yang, "Enhancing Address Translations in Throughput Processors via Compression", *Proc. of the International Conference on Parallel Architectures and Compilation Techniques (PACT)*, (October 2020).
2) M. Mofrad, R. Melhem, Y. Ahmad and M. Hammoud, "Accelerating Distributed Inference of Sparse Deep Neural Networks via Mitigating the Straggler Effect", *Proc. of the High Performance Extreme Computing Conference (HPEC)*, Waltham, MA (September 2020).
3) M. Mofrad, R. Melhem, Y. Ahmad and M. Hammoud, "Studying the Effects of Hashing of Sparse Deep Neural Networks on Data and Model Parallelisms", *Proc. of the High Performance Extreme Computing Conference (HPEC)*, Waltham, MA (September 2020).
4) M. Mofrad, R. Melhem, Y. Ahmad and M. Hammoud, "Graphite: A NUMA-aware HPC System for Graph Analytics based on a new MPI *X Parallelism Model", *Proc. of the Int. Conference on Very Large Databases (VLDB)*, Tokyo, Japan (September 2020).
5) Z. Hussain, T. Znati and R. Melhem, "Enhancing Reliability-Aware Speedup Modelling via Replication", *Proc. of the International Conference on Dependable Systems and Networks (DSN)*, Valencia, Spain (June 2020).
6) D. Ganguly, Z. Zhang, J. Yang and R. Melhem, "Adaptive Page Migration for Irregular Data-intensive Applications under GPU Memory Oversubscription", *Proc. of the Int. Conf. on Parallel and Distributed Processing (IPDPS)*, New Orleans, LA (May 2020).
7) D. Kline, Jr, R. Melhem, A. Jones, "FLOWER and FaME: A Low Overhead Bit-level Fault-map and Fault-tolerance Approach for Deeply Scaled Memories", *Proc. of the International Symposium on High-Performance Computer Architecture (HPCA)*, San Diego, CA (February 2020).
8) S. Longofono, D. Kline, S. Ollivier, R. Melhem and A. Jones, "Toward Secure, Reliable, and Energy Efficient Phase-change Main Memory with MACE", *Proc. of the International Green and Sustainable Computing Conference (IGSC)*, Alexandria, VA. (October 2019).
9) D. Kline, S. Longofono, S. Ollivier, R. Melhem and A. Jones, "PREMSim: A Resilience Framework for Modeling Traditional and Emerging Memory Reliability", *Proc. of the IEEE Int. Symp. On Modeling, Analysis and Simulation of Computer and Telecommunication Systems (MASCOTS)*, Rennes, France (October 2019).
10) D. Kline, S. Longofono, S. Ollivier, R. Melhem and A. Jones, "Predicting Single Event Upsets in DRAM", *Proc. of the IEEE Symposium on Defect and Fault Tolerance in VLSI and Nanotechnology Systems (DFT)*, Delft, Netherlands, (October 2019).
11) M. Mofrad, R. Melhem, Y. Ahmad and M. Hammoud, "Efficient Distributed Graph Analytics using Triply Compressed Sparse Format", *Proc. of IEEE Cluster conference*, Albuquerque, NM (September 2019).
12) D. Ganguly, Z. Zhang, J. Yang and R. Melhem, "Interplay between Hardware Prefetcher and Page Eviction Policy in CPU-GPU Unified Virtual Memory", *Proc. of the International Symposium on Computer Architecture (ISCA)*, Phoenix, AZ (June 2019).
13) S. Ollivier, D. Kline, R. Kawsher, R. Melhem, S. Bhanja and A. Jones, "Leveraging Transverse Reads to Correct Alignment Faults in Domain Wall Memories", *Proc. of the International Conference on Dependable Systems and Networks (DSN)*, Portland, OR (June 2019).
14) Z. Hussain, T. Znati and R. Melhem, "Optimal Placement of In-memory Checkpoints under Heterogeneous Failure Likelihood", *Proc. of the Int. Conf. on Parallel and Distributed Processing (IPDPS)*, Rio de Janeiro, Brazil (May 2019).
15) Z. Hussain, X. Cui, T. Znati and R. Melhem, "CoLoR: Co-Located Rescuers for Fault Tolerance in HPC Systems", *Proc. of the International Conference on Parallel and Distributed Systems (ICPADS), Sentosa*, Singapore (December 2018).
16) Z. Hussain, T. Znati and R. Melhem, "Partial Redundancy in HPC Systems with Non-Uniform Node Reliabilities", *Proc. of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC'18)*, Dallas, TX (November 2018).
17) S. Seyedzadeh, A. Jones and R. Melhem,, "Improving Sustainability Through Disturbance Crosstalk Mitigation in Deeply Scaled Phase-change Memory", *Proc. of the International Green and Sustainable Computing Conference (IGSC)*, Pittsburgh, PA. (October 2018).

18) S. Seyedzadeh, A. Jones and R. Melhem, "Mitigating Word-line Crosstalk using Adaptive Trees of counters", *Proc. of the International Symposium on Computer Architecture (ISCA),* Loa Anglos, CA (June 2018).
19) S. Seyedzadeh, A. Jones and R. Melhem, "Enabling Fine-Grain Restricted Coset Coding Through Word-Level Compression for PCM", *Proc. of the International Symposium on High-Performance Computer Architecture (HPCA),* Vienna, Austria (February 2018).
20) X. Cui, Z. Hussain, T. Znati and R. Melhem, "A systematic Fault-tolerant Computational Model for Both Crash Failures and Silent Data Corruption", *Proc. of the 21st Conference on Innovation in Clouds, Internet and Networks (ICIN),* Paris, France (February 2018).
21) X. Cui, T. Znati and R. Melhem, "Rejuvenating Shadows: Fault Tolerance with Forward Recovery", *Proc. of the Int. Conf. on High Performance Computing and Communications (HPCC),* Bangkok, Thailand, (December 2017).
22) J. Zhang, D. Kline Jr., L. Fang, R. Melhem and A. Jones, "Yoda: Judge me by my size, do you?", *Proc. of the International Conference on Computer Design (ICCD),* Boston, MA (November 2017).
23) J. Zhang, D. Kline Jr., L. Fang, R. Melhem and A. Jones, "Dynamic Partitioning to Mitigate Stuck-at Faults in Emerging Memories", *Proc. of the International Conference on Computer Aided Design (ICCAD),* Irvine, CA. (November 2017).
24) D. Kline, R. Melhem and A. Jones, "Holistic Energy Efficient Crosstalk Mitigation in DRAM", *Proc. of the International Green and Sustainable Computing Conference (IGSC),* Orlando, FL. (October 2017).
25) D. Kline, R. Melhem and A. Jones, "Sustainable Fault Management and Error Correction for Next-Generation Main Memories", *Proc. of the International Green and Sustainable Computing Conference (IGSC),* Orlando, FL. (October 2017).
26) S. Seyedzadeh, D. Kline, A. Jones and R. Melhem, "Mitigating Bitline Crosstalk noise in DRAM Memories", *Proc. of the International Symposium on Memory Systems (MEMSYS),* Washington, DC (October 2017).
27) D. Ganguly, M. Mofrad ,T. Znati, R. Melhem and J. Lange, "Harvesting Underutilized Resources to Improve Responsiveness and Tolerance to Crash and Silent Faults for Data-intensive Applications", *Proc. of the International Conference on Cloud Computing (IEEE CLOUD),* Honolulu, HI, (June 2017).
28) Z. Wang, J. Yang, R. Melhem, B. Childers, Y. Zhang, and M. Guo, "Quality of Service Support for Fine-Grained Sharing on GPUs", *Proc. of the International Symposium on Computer Architecture (ISCA),* Toronto, Canada (June 2017).
29) D. Kline, N. Parshook, Y. Ge, E. Brunvand, R. Melhem, P. Chrysanthis and A. Jones, "Holistically Evaluating the Environmental Impacts in Modern Computing Systems", *Proc. of the International Green and Sustainable Computing Conference (IGSC),* Hangzhou, China (November 2016).
30) J. Jung and R. Melhem, "Empirical, Analytical Study of Hardware-based Page Swap in Hybrid Main Memory System", *Proc. of the International Symposium on Computer Architecture and High Performance Computing (SBAC-PAD),* Los Angeles, CA (October 2016).
31) S. Bock, B. Childers, R. Melhem and D. Mosse, "Concurrent Migration of Multiple Pages in Software-Managed Hybrid Main Memory", *Proc. of the IEEE Int. conference on Computer Design (ICCD),* Pheonix, AZ (October 2016).
32) Y. Alkabani, Z. Koopmans, H. Xu, A. Jones and R. Melhem, "Write Pulse Scaling for Energy Efficient STT-MRAM", *Proc. of the IEEE Computer Society Annual Symposium on VLSI, (ISVLSI),* Pittsburgh, PA (July 2016).
33) X. Cui, T. Znati and R. Melhem, "Adaptive and Power-Aware Resilience for Extreme-scale Computing", *Proc of the 16th IEEE International Conference on Scalable Computing and Communications (ScalCom),* Toulouse, France, July 2016.
34) S. Seyedzadeh, R. Maddah, A. Jones and R. Melhem, "Leveraging ECC to Mitigate Read Disturbance, False Reads and Write Faults in STT-RAM", *Proc of the International Conference on Dependable Systems and Networks (DSN),* Toulouse, France, (June 2016).
35) Z. Wang, J. Yang, R. Melhem, B. Childers, Y. Zhang and M. Guo, "Simultaneous Multikernel GPU: Multi-tasking Throughput Processors via Fine-Grained Sharing", *Proc. of the International Symposium on High-Performance Computer Architecture (HPCA),* Barcelona, Spain (March 2016).
36) J. Liu, J. Yang and R. Melhem, "SAWS, Synchronization Aware GPGPU Warp Scheduling for Multiple Independent Warp Schedulers", *Proc. of the IEEE ACM Int. Symp. On Microarchitecture (MICRO), Waikiki,* HI, (December 2015).

37) S. Bock, B. Childers, R. Melhem and D. Mosse, "HMMSim: A Simulator for Hardware-Software Co-Design of Hybrid Main Memory", *Proc. of the 4th IEEE Non-Volatile Memory System and Applications Symposium (NVMSA)*, Hong Kong (August 2015).
38) S. Bock, B. Childers, R. Melhem and D. Mosse, "Characterizing the Overhead of Software-Managed Hybrid Main Memory", *Proc. of the IEEE Int. Symp. On Modeling, Analysis and Simulation of Computer and Telecommunication Systems (MASCOTS)*, Atlanta, GA (October 2015).
39) S. Seyedzadeh, R. Maddah, A. Jones and R. Melhem, "PRES: Pseudo-Random Encoding Scheme to Increase the Bit Flip Reduction in the Memory", *Proc. of The Design Automation Conference (DAC)*, San Francisco, CA (June 2015).
40) D. Kline, R. Melhem and A. Jones, "Domain-wall Memory Buffer for Low-Energy NoCs", *Proc. of The Design Automation Conference (DAC)*, San Francisco, CA (June 2015).
41) Y. Li, H. Xu, R. Melhem and A. Jones, "Space Oblivious Compression: Power Reduction for Non-Volatile Main Memories", *Proc. of the Great Lake Symp. On VLSI (GLSVLSI)*, Pittsburgh, PA (May 2015).
42) D. Kline, K. Wang, R. Melhem and A. Jones, "MSCS: Multi-hop Segmented Circuit Switching", *Proc. of the Great Lake Symp on VLSI (GLSVLSI)*, Pittsburgh, PA (May 2015).
43) J. Liu, J. Yang and R. Melhem, "GASOLIN: Global Arbitration for Streams of data in Optical Links", *Proc. of the IEEE International Parallel and Distributed Processing Symposium (IPDPS)*, Hyderabad, India (May 2015).
44) S. Bock, B. Childers, R. Melhem and D. Mossé, "Understanding the Limiting Factors of Page Migration in Hybrid Main Memory," *ACM International. Conference on Computing Frontiers*, Ischia, Italy (May 2015).
45) M. Moeng, A. Jones and R. Melhem, "Reciprocal Abstraction for Computer Architecture Co-Simulation", *Proc. of the IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS)*, Philadelphia, PA (March 2015).
46) Y. Du, M. Zhou, B. Childers, D. Mosse and R. Melhem, "Supporting Superpages in Non-Contiguous Physical Memory", *Proc. of the IEEE International Symposium on High Performance Computer Architecture (HPCA)*, Bay Area, CA (February 2015).
47) R. Maddah, S. Seyedzadeh and R. Melhem, "CAFO: Cost Aware Flip Optimization for Asymmetric Memories", *Proc. of the IEEE International Symposium on High Performance Computer Architecture (HPCA)*, Bay Area, CA (February 2015).
48) H. Xu, Y. Li, R. Melhem and A. Jones, "Multilane Racetrack Caches: Improving Efficiency Through Compression and Independent Shifting", *Proc. of the Asia and South Pacific Design Automation Conference (ASP-DAC)*, Tokyo, Japan (January 2015).
49) M. Moeng, R. Melhem and A. Jones, "Weighted-Tuple Synchronization for Parallel Architecture Simulators", *Proc. of the IEEE Int. Symp. On Modeling, Analysis and Simulation of Computer and Telecommunication Systems (MASCOTS)*, Paris, France (September 2014).
50) S. Bock, B. Childers, R. Melhem and D. Mosse, "Concurrent Page Migration for Mobile Systems with OS-Managed Hybrid Memory", *Proc. of the ACM International Conference on Computing Frontiers*, Cagliari, Italy (May 2014).
51) X. Cui, B. Mills, T. Znati and R. Melhem, "Profit Maximization for Resilient Cloud Computing", *Proc. of the International Conference on Cloud Computing and Services Science (CLOSER*), Barcelona, Spain (April 2014).
52) B. Mills, T. Znati, R. Melhem, K. Ferreira and R. Grant, "Energy Consumption of Resilience Mechanisms in Large Scale Systems", *Proc. of the 22nd Euromicro Int. Conference on Parallel, Distributed, and Network-Based Processing (PDP)*, Turin, Italy (February 2014).
53) B. Mills, T. Znati and R. Melhem, "Shadow Computing: An Energy-Aware Fault Tolerant Computing Model", *Proc. of the International Conference on Computing, Networking and Communications (ICNC)*, Honolulu, HI (February 2014).
54) R. Maddah, S. Cho and R. Melhem, "Power of One Bit: Increasing Error Correction Capability with Data Inversion", *Proc. of the Pacific Rim International Symposium on Dependable Computing (PRDC)*, Vancouver, Canada (December 2013).
55) M. Zhou, Y. Du, B. Childers, R. Melhem, D. Mosse, "Writeback-Aware Bandwidth Partitioning for Multi-core Systems with PCM", *Proc. of the International Conference on Parallel Architectures and Compilation Techniques (PACT)*, Edinburgh, Scotland (September 2013).
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At Purdue University (1984 - 1985):

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CS 2450: Intro. To Parallel Computing, G (S'89, S'91, S'93, S'95, S'97, S'99, F'08)
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CS 1515: Scientific Computing, UG (F'86, F'90)
CS 201: Topics in Computer Science, G (S'90)
CS 123: Artificial Intelligence Programming, UG (F'88, F'89)