

Renato Mancuso | CV

111 Cummington Mall, MCS 211 – Boston MA 02215 – USA

☎ +1-(617)-358-8537 • ✉ rmancuso@bu.edu
🌐 <http://cs-people.bu.edu/rmancuso/>

Updated: March 23, 2023

Affiliations

- **Assistant Professor** **Boston, MA, USA**
Boston University
Department: Computer Science
Sept. 2017 - Present
- **Affiliated Faculty** **Boston, MA, USA**
Boston University
Department: Electrical and Computer Engineering
Feb. 2021 - Present

Education

- **Ph.D. in Computer Science** **Urbana, IL, USA**
University of Illinois at Urbana-Champaign
Dissertation title: "Next-generation Safety-critical Systems on Multi-Core COTS Platforms"
Thesis advisor: Professor Marco Caccamo
2012 - May 2017
- **M.Sc. in Computer Engineering** **Rome, Italy**
University of Rome Tor Vergata, Magna cum laude
Thesis title: "Avoiding Memory Access Conflicts in Hard Real-time Multi-core Systems"
Advisor: Professor Marco Cesati
2009 - Feb. 2012
- **B.Sc. in Computer Engineering** **Rome, Italy**
University of Rome Tor Vergata, Magna cum laude
Thesis title: "CoreBoot: the Open-source BIOS and Bootloader"
Advisor: Professor Daniel P. Bovet
2006 - Nov. 2009

Research Interests

Investigating, implementing and testing **hardware-, hypervisor-, and OS-level** techniques to restore strong confidence in the predictable, robust, and secure operation of high-performance **safety-critical cyber-physical systems (CPS)**, with special focus on hybrid FPGA+CPU platforms and profile-driven resource management with practical applications in automotive, avionics and unmanned aerial vehicles.

Research Positions

- **Graduate Research Assistant** **Urbana, IL, USA**
Department of Computer Science, UIUC
2012 - 2014

Supported by: Rockwell Collins Inc. and NSF

- Evaluation of real-time predictability and performance degradation due to inter-core performance interference on shared memory hierarchy
- Design and feasibility study of techniques to mitigate performance interference in shared CPU caches
- OS-level implementation of proof-of-concept support for real-time oriented shared cache management

Graduate Research Assistant

Urbana, IL, USA

- *Department of Computer Science, UIUC* 2014 - 2015

Supported by: Rockwell Collins Inc. and NSF

In collaboration with: Department of Aerospace Engineering, UIUC

- Study of techniques to reduce performance interference due to DRAM bank sharing
- OS-level implementation of proof-of-concept support for real-time oriented DRAM bank management
- Integration of hardware resource management techniques for overall evaluation and theoretical scheduling
- Design of OS-level techniques for power adaptive CPU+GPU UAVs.
- Construction of a UAV testbed for live evaluation

Graduate Research Assistant

Urbana, IL, USA

- *Department of Computer Science, UIUC* 2015 - 2017

Supported by: Hitachi America Ltd. and NSF

- Predictability evaluation of new-generation multi-core automotive platforms for ASIL-D certification
- Re-design of OS-level resource management and scheduling to exploit heterogeneous memory layout
- Design of OS-level predictable strategies to recover from detectable memory errors
- Proof-of-concept implementation extending an existing AUTOSAR-compliant OS

Research Grants

Total: USD 2,132,630

Grant: Division Of Computer and Network Systems (CNS)

- *National Science Foundation* Mar. 2023

Project: "CAREER: Timeliness as a Controllable Dimension via Knowledge-driven System Management "

Funding: USD 603,489

Role: PI

Award Nr.: CCF-2238476

Start-End: May 1, 2023—April 30, 2028

Grant: Red Hat Collaboratory Research Incubation Award Program

- *Red Hat* Jan. 2023

Project: "Toward on-the-Fly Reorganization of High-Order Data Objects"

Funding: USD 149,610

Role: PI

Co-PIs: Prof. Manos Athanassoulis

Start-End: Jan. 1, 2023—Jan. 1, 2024

Grant: Red Hat Collaboratory Research Incubation Award Program

- *Red Hat* Jan. 2023

Project: "Relational Memory Controller"

Funding: USD 149,999

Role: Co-PI

Co-PIs: Prof. Manos Athanassoulis

Start-End: Jan. 1, 2023—Jan. 1, 2024

Grant: Red Hat Collaboratory Research Incubation Award Program

- *Red Hat* Jan. 2023

- Project: "Minimal Mobile Systems via Cloud-Based Adaptive Task Processing"
 Funding: USD 75,000
 Role: Co-PI
 Co-PIs: Prof. Eshed Ohn-Bar
 Start-End: Jan. 1, 2023—Jan. 1, 2024
- **Grant: Technologies for Next-Gen Integrated Automotive Platforms** Dec. 2022
 Bosch GmbH
 Project: "Profile-driven System Management in Real-Time Cloud Backend Systems"
 Funding: USD 60,000
 Role: PI
 Start-End: Jan. 15, 2023—Jan. 15, 2024
 - **Grant: Red Hat Collaboratory Research Incubation Award Program** Jan. 2022
 Red Hat
 Project: "Near-Data Data Transformation"
 Funding: USD 150,000
 Role: Co-PI
 Co-PIs: Prof. Manos Athanassoulis
 Start-End: Jan. 1, 2022—Jan. 1, 2023
 - **Grant: Technologies for Next-Gen Integrated Automotive Platforms** Dec. 2021
 Bosch GmbH
 Project: "From Partitioning to Profiling-aided Shared Resource Management"
 Funding: USD 80,000
 Role: PI
 Start-End: Feb. 10, 2022—Feb. 10, 2023
 - **Grant: Cisco Research** Sept. 2021
 Cisco Systems, Inc.
 Project: "Near-Data Data Transformation for Edge Computing"
 Funding: USD 50,000
 Role: Co-PI
 Start-End: Sept. 1, 2021—Aug. 31, 2022
 - **Grant: Division of Computing and Communication Foundations (CCF)** Dec. 2020
 National Science Foundation
 Project: "Beyond Accelerators - Using FPGAs to Achieve Fine-grained Control of Data-flows in Embedded SoCs"
 Funding: USD 500,000
 Role: PI
 Award Nr.: CCF-2008799
 Start-End: July 15, 2020—June 30, 2023
 - **Grant: Technologies for Next-Gen Integrated Automotive Platforms** Dec. 2020
 Bosch GmbH
 Project: "From Partitioning to Profiling-aided Shared Resource Management"
 Funding: USD 80,000
 Role: PI
 Start-End: Feb. 10, 2021—Feb. 10, 2022
 - **Grant: Collaboratory Support for Grad Student Research** Dec. 2019
 Red Hat
 Project: "Programmable Logic In-the-Middle: the Case for Relational Memory"
 Funding: USD 136,000
 Role: PI
 Co-PIs: Prof. Manos Athanassoulis
 Start-End: Feb. 1, 2020—Feb. 1, 2022

- **Grant: Technologies for Next-Gen Integrated Automotive Platforms**
Bosch GmbH *Dec. 2019*
 Project: "Towards A Unified Virtualized Shared Resource Management Infrastructure"
 Funding: USD 80,000
 Role: PI
 Start-End: Feb. 10, 2020—Feb. 10, 2021
- **Grant: Hariri Institute Research Incubation Award**
Boston University *Feb. 2019*
 Project: "Data Driven, Inexpensive and Reusable Sensors for Water Contamination Detection"
 Funding: USD 18,532
 Role: PI
 Co-PIs: Prof. Xi Lin

Honors, Awards, and Patents

- **Gerald & Deanne Gitner Family Award for Innovation in Teaching with Technology**
Boston University *Mar. 2023*
 The award recognizes the faculty member or team that best exemplifies innovation in teaching through the use, development, or adaptation of technology within or outside Boston University.
- **Faculty Early Career Development (CAREER) Award**
National Science Foundation (NSF) *Mar. 2023*
- **Best Reviewer Award**
IEEE Real-Time Systems Symposium (RTSS) *Dec. 2022*
- **Elevated to IEEE Senior Member**
IEEE Membership *Nov. 2022*
- **Best Student Paper Award**
IEEE Real-Time Systems Symposium (RTSS) *Dec. 2020*
- **Best Paper Award**
IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS) *Apr. 2020*
- **Outstanding Paper Award**
Euromicro Conference on Real-Time Systems (ECRTS) *July 2019*
- **Best Presentation Award**
IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS) *Apr. 2016*
- **Best Student Paper Award**
IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS) *Apr. 2013*
- **Finalist, Qualcomm Innovation Fellowship**
Qualcomm Inc. *Spring 2016*
 The QInF program is focused on recognizing, rewarding, and mentoring innovative PhD students across a broad range of technical research areas, based on Qualcomm's core values of innovation, execution and teamwork.
- **Computer Science Excellence Fellowship**
College of Engineering, University of Illinois *Fall 2015, Spring 2016*
 The Computer Science Excellence Fellowship is funded thanks to the Graduate College's Block Grant Program, which provides funds to help departments recruit and retain outstanding graduate students.
- **Patent, Issued** **Urbana, IL, USA**
University of Illinois at Urbana-Champaign *August 2016*

Title: "Real-Time Scratchpad-Centric Operating System for Multi-Core Embedded System"

Issued on: May 12, 2020

US Patent Nr.: 10649914

Recognized on List of Teachers Ranked Excellent

- College of Engineering, University of Illinois

Fall 2013

Homo Sapiens Sapiens Scholarship

- INPS Italy

Spring 2014

Government-issued scholarship to support high-degree education in promising young researchers

Patent, Main Inventor

Rome, Italy

- CFI Progetti LLC.

May 2014

Title: "Providing Interactive Pharmaceutical Services through Internet"

Submitted/accepted: June 2011 / May 2014

Patent Nr.: RM2011A000297

Merit Scholarship

- Accenture, PLC

Spring 2010

High Honor Award and Scholarship

Rome, Italy

- University of Rome Tor Vergata

2009, 2010, 2011, 2012

Full Merit Scholarship

Rome, Italy

- Excellence University College "Lamaro-Pozzani"

2006-2011

Awarded by the Italian Federation "Cavalieri del Lavoro" on a merit-only basis, through a competitive selection procedure involving students from all over Italy. The scholarship was renewed every year, having reached fixed targets, such as: passing all the scheduled university exams with an average grade of at least 27/30, succeeding in the English, Economics and Law internal courses and actively attending all the College activities, meetings and lectures.

Peer Reviewed Conference and Journal Papers

Published

- [1] **R. Mancuso**, S. Roozkhosh, D. Hoornaert, J.H. Mun, T.I. Papon, M. Athanassoulis, "Software-Shaped Platforms", in Proceedings of the 2nd Real-time and Intelligent Edge Computing Workshop (RAGE 2023), May 2023, San Antonio, TX, USA. *To appear*.
- [2] D. Oliveira, W. Chen, S. Pinto, **R. Mancuso**, "Investigating and Mitigating Contention on Low-End Multi-Core Microcontrollers", in Proceedings of the 2nd Real-time and Intelligent Edge Computing Workshop (RAGE 2023), May 2023, San Antonio, TX, USA. *To appear*.
- [3] R. Tabish, R. Pellizzoni, **R. Mancuso**, G. Gracioli, R. Miroslanlou, M. Caccamo, "X-Stream: Accelerating Streaming Segments on Modern MPSoCs", Journal of Systems Architecture, *Accepted, Pre-proof* (March 2023), ISSN 1383-7621.
- [4] G. Gracioli, R. Tabish, **R. Mancuso**, R. Miroslanlou, R. Pellizzoni, M. Caccamo, "Lazy Load Scheduling for Mixed-Criticality Applications in Heterogeneous MPSoCs", ACM Trans. Embed. Comput. Syst. *Just Accepted* (March 2023).
- [5] A. Zuepke, A. Bastoni, W. Chen, M. Caccamo, **R. Mancuso**, "MemPol: Policing Core Memory Bandwidth from Outside of the Cores", In Proceedings of the 29th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS), May 2023, San Antonio, Texas, USA. *To appear*.
- [6] T.I. Papon, J. H. Mun, S. Roozkhosh, D. Hoornaert, A. Sanaullah, U. Drepper, **R. Mancuso**, M. Athanassoulis, "Relational Fabric: Transparent Data Transformation", in Proceedings of the IEEE International Conference on Data Engineering (ICDE 2023), April 2023, Anaheim, California, USA. *To appear*.
- [7] S. Roozkhosh, D. Hoornaert, J. H. Mun, P. Tarikul, U. Drepper, **R. Mancuso**, M. Athanassoulis, "Relational Memory: Native In-Memory Accesses on Rows and Columns", in Proceedings of the 26th International Conference on Extending Database Technology (EDBT 2023), March 2023, Ioannina, Greece. *To appear*.
- [8] S. Roozkhosh, D. Hoornaert, **R. Mancuso**, "CAESAR: Coherence-Aided Elective and Seamless Alternative Routing via on-chip FPGA", in Proceedings of the 43rd IEEE Real-Time Systems Symposium (RTSS

- 2022), December 2022, Houston, TX, USA.
- [9] M. Nicolella, D. Hoornaert, S. Roozkhosh, A. Bastoni, **R. Mancuso**, “Know your Enemy: Benchmarking and Experimenting with Insight as a Goal”, WiP Session @ 43rd IEEE Real-Time Systems Symposium (RTSS@Work 2022), December 2022, Houston, TX, USA.
 - [10] S. Roozkhosh, D. Hoornaert, **R. Mancuso**, M. Athanassoulis, “Hardware Data Re-organization Engine for Real-Time Systems”, WiP Session @ 43rd IEEE Real-Time Systems Symposium (RTSS@Work 2022), December 2022, Houston, TX, USA.
 - [11] D. Hoornaert, G. Ghaemi, A. Bastoni, **R. Mancuso**, M. Caccamo, G. Corradi, “On the Interplay of Computation and Memory Regulation in Multicore Real-Time Systems”, in Proceedings of the 16th Operating Systems Platforms for Embedded Real-Time applications Workshop (OSPert 2022), July 2022, Modena, Italy.
 - [12] M. Nicolella, S. Roozkhosh, D. Hoornaert, A. Bastoni, **R. Mancuso**, “RT-Bench: an Extensible Benchmark Framework for the Analysis and Management of Real-Time Applications”, in Proceedings of the 30th International Conference on Real-Time Networks and Systems (RTNS 2022), June 2022, Paris, France.
 - [13] P. Sohal, M. Bechtel, **R. Mancuso**, H. Yun, O. Krieger, “A Closer Look at Intel Resource Director Technology (RDT)”, in Proceedings of the 30th International Conference on Real-Time Networks and Systems (RTNS 2022), June 2022, Paris, France.
 - [14] P. Sohal, R. Tabish, U. Drepper, **R. Mancuso**, “Profile-driven Memory Bandwidth Management for Accelerators and CPUs in QoS-enabled Platforms”, in Real-Time Systems, April 2022.
 - [15] O. Dantsker, **R. Mancuso**, “Propulsion System Instrumentation Development and Integration on Small-and Medium-Sized Electric Unmanned Aircraft”, In Proceedings of the AIAA Scitech 2022 Forum, Jan. 2022, San Diego, CA, USA.
 - [16] G. Schwärcke, R. Tabish, R. Pellizzoni, **R. Mancuso**, A. Bastoni, A. Züpke, M. Caccamo, “A Real-Time virtio-based Framework for Predictable Inter-VM Communication”, in Proceedings of the 42nd IEEE Real-Time Systems Symposium (RTSS 2021), Dec. 2021.
 - [17] S. Mysore, B. Mabsout, **R. Mancuso**, K. Saenko, “Honey, I Shrunk The Actor: A Case Study on Preserving Performance with Smaller Actors in Actor-Critic RL”, in Proceedings of the IEEE Conference on Games (CoG), Copenhagen, Denmark, Aug. 2021.
 - [18] G. Ghaemi, D. Tarapore, **R. Mancuso**, “Governing with Insights: Towards Profile-driven Cache Management of Black-Box Applications”, in Proceedings of the 33rd Euromicro Conference on Real-Time Systems (ECRTS 2021), Online, July 2021.
 - [19] D. Hoornaert, S. Roozkhosh, **R. Mancuso**, “A Memory Scheduling Infrastructure for Multi-core Systems with Re-programmable Logic”, in Proceedings of the 33rd Euromicro Conference on Real-Time Systems (ECRTS 2021), Online, July 2021.
 - [20] R. Tabish and J.Y. Wen and R. Pellizzoni and **R. Mancuso** and H. Yun and M. Caccamo and L. R. Sha, “An analyzable inter-core communication framework for high-performance multicore embedded systems”, in Journal of Systems Architecture, Volume 118, 2021, Pages 102178, ISSN 1383-7621, Jun. 2021.
 - [21] S. Mysore, B. Mabsout, K. Saenko, **R. Mancuso**, “How to Train your Quadrotor: A Framework for Consistently Smooth and Responsive Flight Control via Reinforcement Learning”, in ACM Transactions on Cyber-Physical Systems, 2021.
 - [22] D. Hoornaert, S. Roozkhosh, **R. Mancuso**, M. Caccamo, “Identifying Unexpected Inter-core Interference Induced by Shared Cache”, in Proceedings of the Work-in-Progress at IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS), Online, May 2021.
 - [23] S. Mysore, B. Mabsout, **R. Mancuso**, K. Saenko, “Regularizing Action Policies for Smooth Control with Reinforcement Learning”, in Proceedings of the IEEE International Conference on Robotics and Automation (ICRA 2021), Xi’an, China, May 2021.
 - [24] D. Tarapore, S. Roozkhosh, S. Brzozowski, **R. Mancuso**, “Observing the Invisible: Live Cache Inspection for High-Performance Embedded Systems”, in IEEE Transactions on Computers (IEEE TC), Jan. 2021.
 - [25] P. Sohal, R. Tabish, U. Drepper, **R. Mancuso**, “E-WarP: a System-wide Framework for Memory Bandwidth Profiling and Management”, in Proceedings of the 41st IEEE Real-Time Systems Symposium (RTSS 2020), Houston, TX, USA, Dec. 2020. (**Best Student Paper Award**)
 - [26] R. Tabish, J.Y. Wen, R. Pellizzoni, **R. Mancuso**, H. Yun, M. Caccamo and L. Sha, “SCE-Comm: A Real-

- Time Inter-Core Communication Framework for Strictly Partitioned Multi-core Processors”, In Proceedings of the 9th Mediterranean Conference on Embedded Computing (MECO 2020), Budva, Montenegro, June 2020.
- [27] A. Bansal and J. Singh and Y. Hao and J.Y. Wen and **R. Mancuso** and M. Caccamo, “Reconciling Predictability and Coherent Caching”, In Proceedings of the 9th Mediterranean Conference on Embedded Computing (MECO 2020), Budva, Montenegro, June 2020.
 - [28] S. Roozkhosh, **R. Mancuso**, “The Potential of Programmable Logic in the Middle: Cache Bleaching”, In Proceedings of the IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS), April 2020, Sydney, Australia. **(Best Paper Award)**
 - [29] O. Dantsker, M. Theile, M. Caccamo, S. Yu, M. Vahora, **R. Mancuso**, “Continued Development and Flight Testing of a Long-Endurance Solar-Powered Unmanned Aircraft: UIUC-TUM Solar Flyer”, In Proceedings of the AIAA Scitech 2020 Forum, Jan. 2020, Orlando, FL, USA.
 - [30] O. Dantsker, M. Caccamo, M. Vahora, **R. Mancuso**, “Flight & Ground Testing Data Set for an Unmanned Aircraft: Great Planes Avistar Elite”, In Proceedings of the AIAA Scitech 2020 Forum, Jan. 2020, Orlando, FL, USA.
 - [31] R. Tabish, **R. Mancuso**, S. Wasly, R. Pellizzoni, M. Caccamo, “A Real-Time Scratchpad-centric OS with Predictable Communication for Multi-core Embedded Systems”, in Real-Time Journal (RTSJ), May 2019.
 - [32] G. Gracioli, R. Tabish, **R. Mancuso**, R. Mirosanlou, R. Pellizzoni, M. Caccamo, “Designing Mixed Criticality Applications on Modern Heterogeneous MPSoC Platforms”, Proceedings of the 31st Euromicro Conference on Real-Time Systems (ECRTS), July 2019, Stuttgart, Germany. **(Outstanding Paper Award)**
 - [33] **R. Mancuso**, H. Yun and I. Puaut, “Impact of DM-LRU on WCET: a Static Analysis Approach”, Proceedings of the 31st Euromicro Conference on Real-Time Systems (ECRTS), July 2019, Stuttgart, Germany.
 - [34] J. Ponniah, O. Dantsker, **R. Mancuso**, “Design of Multi-Agent UAV Simulator to Support the Development of the MARSNet Communication Protocol”, Proceedings of the AIAA Aviation 2019 Forum, Dallas, TX, USA, June 2019.
 - [35] A. Raza, P. Sohal, J. Cadden, J. Appavoo, U. Drepper, R. Jones, O. Krieger, **R. Mancuso**, L. Woodman, “Unikernels: The Next Stage of Linux’s Dominance”, Proceedings of the 17th Workshop on Hot Topics in Operating Systems (HotOS 2019), Bertinoro, Italy.
 - [36] W. Koch, **R. Mancuso**, R. West and A. Bestavros, “Reinforcement Learning for UAV Attitude Control”, In ACM Transactions on Cyber-Physical Systems (TCPS), Vol. 3, Issue 2, Art. 22, February 2019.
 - [37] O. Dantsker, **R. Mancuso**, “Flight Testing Data Set for Subscale GA Aircraft: 26%-scale Cub Crafters CC11-100 Sport Cub S2”, Proceedings of the AIAA Scitech 2019 Forum, San Diego, CA, USA, Jan. 2019.
 - [38] O. Dantsker, **R. Mancuso**, “Flight Data Acquisition Platform Development, Integration, and Operation on Small-to Medium-Sized Unmanned Aircraft”, Proceedings of the AIAA Scitech 2019 Forum, San Diego, CA, USA, Jan. 2019.
 - [39] T. Kloda, M. Solieri, **R. Mancuso**, N. Capodici, P. Valente, M. Bertogna, “Deterministic Memory Hierarchy and Virtualization for Modern Multi-Core Embedded Systems”, In Proceedings of the IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS), April 2019, Montreal, Canada.
 - [40] A. Agrawal, **R. Mancuso**, R. Pellizzoni, G. Fohler, “Analysis of Dynamic Memory Bandwidth Regulation in Multi-core Real-Time Systems”, In Proceedings of the 39th IEEE Real-Time Systems Symposium (RTSS), December 2018, Nashville TN, USA.
 - [41] **R. Mancuso**, S. Chaki, “Verification of OS-level Cache Management”, In Proceedings of Operating Systems Platforms for Embedded Real-Time applications (OSPERT), May 2018.
 - [42] A. Bansal, R. Tabish, G. Gracioli, **R. Mancuso**, R. Pellizzoni and M. Caccamo, “Evaluating Memory Subsystem of Configurable Heterogeneous MPSoC”, In Proceedings of Operating Systems Platforms for Embedded Real-Time applications (OSPERT), May 2018.
 - [43] F. Farshchi, P. K. Valsan, **R. Mancuso**, H. Yun, “Deterministic Memory Abstraction and Supporting Multicore System Architecture”, Proceedings of the 30th Euromicro Conference on Real-Time Systems (ECRTS), July 2018, Barcelona, Spain.
 - [44] O. Dantsker, M. Theile, M. Caccamo, **R. Mancuso**, “Design, Development, and Initial Testing of a Computationally-Intensive, Long-Endurance Solar-Powered Unmanned Aircraft”, Proceedings of the 36th

Applied Aerodynamics Conference, Atlanta, GA, USA, June 2018.

- [45] H. Wang, Y. Gao, S. Hu, S. Wang, **R. Mancuso**, M. Kim, P. Wu, L. Su, L. Sha, T. Abdelzaher, "On Exploiting Structured Human Interactions to Enhance Sensing Accuracy in Cyber-physical Systems", *ACM Transactions on Cyber-Physical Systems*, vol. 1 no. 3, p. 1-19, July 2017.
- [46] A. Melani, **R. Mancuso**, M. Caccamo, G. Buttazzo, J. Freitag, S. Uhrig, "A Scheduling Framework for Handling Integrated Modular Avionic Systems on Multicore Platforms", In *Proceedings of the 23rd IEEE International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA)*, August 2017, Hsinchu, Taiwan.
- [47] F. Abdi, **R. Mancuso**, R. Tabish, M. Caccamo, "Restart-Based Fault-Tolerance: System Design and Schedulability Analysis", In *Proceedings of the 23rd IEEE International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA)*, August 2017, Hsinchu, Taiwan.
- [48] **R. Mancuso**, R. Pellizzoni, N. Tokcan, M. Caccamo, "WCET Derivation under Single Core Equivalence with Explicit Memory Budget Assignment", *Proceedings of the 29th Euromicro Conference on Real-Time Systems (ECRTS)*, June 2017, Dubrovnik, Croatia.
- [49] O. Dantsker, M. Selig, **R. Mancuso**, "A Rolling Rig for Propeller Performance Testing", *Proceedings of the 35th AIAA Applied Aerodynamics Conference*, Denver, CO, USA, June 2017.
- [50] R. Tabish, **R. Mancuso**, S. Wasly, S. S. Phatak, R. Pellizzoni, M. Caccamo, "A Reliable and Predictable OS for Real-Time Embedded Systems", *Proceedings of the IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS)*, Pittsburgh, USA, 2017.
- [51] L. Sha, M. Caccamo, **R. Mancuso**, J. E. Kim, M. K. Yoon, R. Pellizzoni, H. Yun, R. B. Kegley, D. R. Perlman, G. Arundale, R. Bradford, "Real-Time Computing on Multicore Processors", *IEEE Computer*, vol. 49 no. 9, p. 69-77, September 2016.
- [52] A. Melani, **R. Mancuso**, D. Cullina, M. Caccamo, L. Thiele, "Optimizing Resource Speed for Two-Stage Real-Time Tasks", *Real-Time Systems*, doi:10.1007/s11241-016-9259-y, September 2016.
- [53] F. Abdi, **R. Mancuso**, S. Bak, O. Dantsker, M. Caccamo, "Reset-Based Recovery for Real-Time Cyber-Physical Systems with Temporal Safety Constraints", *Proceedings of the 21st IEEE International Conference on Emerging Technologies Factory Automation and Applications Symposium (ETFA)*, Berlin, Germany, September 2016.
- [54] R. Tabish, **R. Mancuso**, S. Wasly, A. Alhammad, S. S. Phatak, R. Pellizzoni, M. Caccamo, "A Real-Time Scratchpad-centric OS for Multi-core Embedded Systems", *Proceedings of the IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS)*, April 2016, Vienna, Austria. (**Best Presentation Award**)
- [55] A. Melani, **R. Mancuso**, D. Cullina, M. Caccamo, L. Thiele, "Speed Optimization for Tasks with Two Resources", *Proceedings of the International Conference on Design, Automation, and Test in Europe (DATE)*. Dresden, Germany, March 2016.
- [56] **R. Mancuso**, R. Pellizzoni, M. Caccamo, L. Sha, H. Yun, "WCET(m) Estimation in Multi-Core Systems using Single Core Equivalence", *Proceedings of the 27th Euromicro Conference on Real-Time Systems (ECRTS)*, July 2015, Lund, Sweden.
- [57] **R. Mancuso**, A. V. Louis, M. Caccamo, "Using Traffic Phase Shifting to Improve AFDX Link Utilization", *Proceedings of the 15th ACM International Conference on Embedded and Software (EMSOFT)*. Amsterdam, The Netherlands, October 2015.
- [58] O. Dantsker, A.V. Louis, R. Mancuso, M. Caccamo, M. Selig, "SDAC-UAS: A Sensor Data Acquisition Unmanned Aerial System for Flight State Monitoring and Aerodynamic Data Collection", *Proceedings of the 10th AIAA Infotech @ Aerospace*, Kissimmee, FL, USA, Jan. 2015.
- [59] G. Gracioli, A. Alhammad, **R. Mancuso**, A. A. Frohlich, R. Pellizzoni, "A Survey on Cache Management Mechanisms for Predictable Real-Time Embedded Systems", Accepted for publication on *ACM Computing Survey*, September 2015.
- [60] M. Cesati, **R. Mancuso**, E. Betti, M. Caccamo, "A Memory Access Detection Methodology for Accurate Workload Characterization", *Proceedings of the IEEE International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA)*. Hong Kong, China, August 2015.
- [61] Y. Gao, S. Hu, **R. Mancuso**, M. Kim, P. L. Wu, L. Su, L. Sha, T. Abdelzaher, "Exploiting Structured Human Interactions to Enhance Estimation Accuracy in Cyber-physical Systems", *Proceedings of the IEEE*

- International Conference on Cyber-Physical Systems (ICCPS 2015), Seattle, WA, USA, April 2015.
- [62] **R. Mancuso**, Or D. Dantsker, M. Caccamo, M. S. Selig, "A Low-Power Architecture for High Frequency Sensor Acquisition in Many-DOF UAVs", Proceedings of the 5th Intl. Conference on Cyber-Physical Systems (ICCPS), April 2014, Berlin, Germany.
 - [63] H. Yun, **R. Mancuso**, Z. Wu, R. Pellizzoni, "PALLOC: DRAM Bank-Aware Memory Allocator for Performance Isolation on Multicore Platforms", Proceedings of the IEEE Intl. Real-Time and Embedded Technology and Applications Symposium (RTAS), April 2014, Berlin, Germany.
 - [64] **R. Mancuso**, P. Srivastava, D. Cheng, M. Caccamo, "A Hardware Architecture to Deploy Complex Multiprocessor Scheduling Algorithms", Proceedings of the IEEE International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA). Chongqing, China, August 2014.
 - [65] **R. Mancuso**, R. Dudko, M. Caccamo, "Light-PREM: Automated Software Refactoring for Predictable Execution on COTS Embedded Systems", Proceedings of the IEEE International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA). Chongqing, China, August 2014.
 - [66] Or D. Dantsker, **R. Mancuso**, M. S. Selig, M. Caccamo, "High-Frequency Sensor Data Acquisition System (SDAC) for Flight Control And Aerodynamic Data Collection Research on Small to Mid-Sized UAVs", Proceedings of the AIAA Aviation and Aeronautics Forum and Exposition, Applied Aerodynamic Conference, (APA'14). Atlanta, Georgia, June 2014.
 - [67] F. Abdi, J. V. D. Woude, Y. Lu, S. Bak, M. Caccamo, L. Sha, **R. Mancuso**, S. Mohan, "On-Chip Control Flow Integrity Check for Real Time Embedded Systems", Proceedings of the 1st IEEE Intl. Conference on Cyber-Physical Systems, Networks and Applications (CPSNA), August 2013, Taipei, Taiwan.
 - [68] **R. Mancuso**, R. Dudko, E. Betti, M. Cesati, M. Caccamo, R. Pellizzoni, "Real-Time Cache Management Framework for Multi-core Architectures", Proceedings of the IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS), April 2013, Philadelphia, USA. **(Best Student Paper Award)**

Technical Reports

- [1] A. Raza, T. Unger, M. Boyd, E. Munson, P. Sohal, U. Drepper, R. Jones, D. Bristot de Oliveira, L. Woodman, **R. Mancuso**, J. Appavoo, O. Krieger, "Integrating Unikernel Optimizations in a General Purpose OS", Technical Report at BU, Available at: <https://arxiv.org/abs/2206.00789>.
- [2] E. Asyabi, A. Bestavros, **R. Mancuso**, R. West, E. Sharafzadeh, "Akita: A CPU scheduler for virtualized Clouds", Technical Report at BU, Available at: <https://arxiv.org/pdf/2009.09104.pdf>.
- [3] W. Koch, **R. Mancuso**, and A. Bestavros, "Neuroflight: Next Generation Flight Control Firmware", Technical Report at BU, Available at: <https://arxiv.org/pdf/1901.06553.pdf>.
- [4] A. Melani, **R. Mancuso**, D. Cullina, M. Caccamo, L. Thiele, "Resource Speed Optimization for Two-Stage Flow-Shop Scheduling", Technical Report at UIUC, Available at: <http://hdl.handle.net/2142/88404>
- [5] **R. Mancuso**, R. Pellizzoni, M. Caccamo, L. Sha, H. Yun, "Response-Time Analysis for Single Core Equivalence Framework", Technical Report at UIUC, Available at: <http://hdl.handle.net/2142/55570>
- [6] L. Sha, M. Caccamo, **R. Mancuso**, J.E. Kim, M.K. Yoon, R. Pellizzoni, H. Yun, R. Kegley, D. Perlman, G. Arundale, R. Bradford, "Single Core Equivalent Virtual Machines for Hard Real-Time Computing on Multicore Processors", Technical Report at UIUC, Available at: <http://hdl.handle.net/2142/55672>
- [7] M. Cesati, **R. Mancuso**, E. Betti, M. Caccamo, "MadT: A Memory Access Detection Tool for Symbolic Memory Profiling", Technical Report at UIUC, Available at: <http://hdl.handle.net/2142/78093>
- [8] **R. Mancuso**, A. V. Louis, M. Caccamo, "Improving Bandwidth Utilization With Deterministic Delivery Guarantees in AFDX through Traffic Phase-Shifting", Technical Report at UIUC, Available at: <http://hdl.handle.net/2142/78193>

Press Releases and Other Articles

- **Knowledge is Power. The Case for Profile-driven Resource Management** **ACM SIGBED Blog**
 ○ *Online Article (Renato Mancuso, Dakshina Dasari, Arne Hamann)* Nov. 2021
 URL: <https://sigbed.org/2021/11/08/knowledge-is-power/>
- **Simplifying machine learning for drone flight control** **Hariri Institute News**
 ○ *Online Article (Gina Mantica)* March 2021

URL: <https://www.bu.edu/hic/2021/03/17/simplifying-machine-learning-for-drone-flight-control/>

- **Cyber-Physical Systems: the battle of Self- and Context-Awareness** **ACM SIGBED Blog**
Online Article (Renato Mancuso) *Jan. 2021*
URL: <https://sigbed.org/2021/01/20/cyber-physical-systems-embodiment-the-battle/>
- **We Have Emphasized Learning and Compassion** **ACM News**
Online Article (Gregory Goth) *Sept. 2020*
URL: <https://cacm.acm.org/news/247463-we-have-emphasized-learning-and-compassion/fulltext>
- **How AI can enhance drone flight** **TechTalks**
Online Article (Ben Dickson) *June 2019*
URL: <https://bdtechtalks.com/2019/06/17/neuroflight-neural-networks-drone-controller/>

Teaching and Mentoring

- **Main Instructor, Embedded Systems Development (CS-454/654)** **Boston, MA**
Computer Science, Boston University *Spring 2019, 2020, 2022, 2023*
 - Lab-based hands-on course touching on aspects of embedded and cyber-physical systems development.
 - Official page at: https://cs-people.bu.edu/rmancuso/courses/cs454_654-sp23/
- **Main Instructor, Challenges in Cyber-Physical Systems (CS-591 M1)** **Boston, MA**
Computer Science, Boston University *Spring 2018*
 - Developed syllabus and reading list of research papers in CPS
 - Assigned presentations and projects to a class of 30 students
 - Organized peer-reviewed student presentations on research paper
 - Formed student teams for custom class projects (6 projects total)
 - Official page at: <http://cs-people.bu.edu/rmancuso/courses/cs591-sp18/index.php>
- **Main Instructor, Fundamentals of Computing Systems (CS-350)** **Boston, MA**
Computer Science, Boston University *Fall 2017—2022*
 - Prepared syllabus, lectures notes, and slides for a class of ≈ 120 students
 - Held office hours and coordinated discussion sections (2-3 TA's)
 - Prepared weekly assignments and exams: 2 midterms and 1 final
 - Developed interactive code evaluation system (CodeBuddy)
 - Coordinated grading of assignments and exams
 - Organized end-of-semester online programming challenge
 - Official page at: <http://cs-people.bu.edu/rmancuso/courses/cs350-fa22>
- **Co-Instructor, Fundamentals of Computing Systems (CS-350)** **Boston, MA**
Computer Science, Boston University *Spring 2018, 2019, 2020, 2022*
 - Delivered 1/3 of the frontal lectures
 - Held office hours and coordinated discussion sections (2 TA's)
 - Support in preparing weekly assignments and exams: 2 midterms and 1 final
- **Teaching Assistant, System Programming (CS-241)** **Urbana, IL**
College of Engineering, University of Illinois *Spring 2013*
 - Prepared discussion sections with presentations and interactive programming sessions with 60 students
 - Held office hours with live debugging of student code and clarification of class material
 - Prepared machine problems, instructions for assignments and grading strategies
 - Implemented, maintained and executed auto-graders
 - Graded assignments (with auto-graders), midterms and finals
 - Coordinated with other TAs and faculty for the direction of the course
- **Undergraduate Mentor**
Department of Computer Science, University of Illinois *2013 - 2017*

- Evaluated student fit to research projects based on CV evaluation and interviews
- Assigned students to ongoing research projects based on their inclinations
- Drafted project statement to be used as written agreement for independent study projects (CS-397)
- Prepared embedded platforms, source trees, development environments and repositories for students
- Evaluated/interviewed 11 students; mentored 5 students

Graduate Mentor

- *Department of Computer Science, University of Illinois* 2014 - 2017

- Coordinated with faculty over student selection for Ph.D. program or short-term visiting
- Assessed student fit to research group based on CV and research interests
- Suggested short-term and long-term research path
- Guided new students to understand the exact scope of project, write formal reports and prepare presentations for conferences and industry partners
- Prepared literature review list for incoming students and introduced basic background concepts
- Mentored 3 students

Invited Lecturer, Cyber-Physical Systems Munich, Germany

- *Dept. of Electrical and Computer Engineering, Technical University of Munich* Jan. 2015

- Prepared and lectured 4 graduate-level classes on Network Calculus and Real-Time Calculus
- Integrated lectures with rest of course material
- Prepared questions about presented material for practice exam and final exam

Invited Lecturer, System Programming (CS-241) Urbana, IL

- *College of Engineering, University of Illinois* Feb. 2014

- Prepared tool to demonstrate virtual memory mapping and manipulate memory of running processes
- Lectured about theory on memory mapping
- Performed live demonstration of attacks on memory of running processes

Student Advising

Current Ph.D. Advisees.....

1. **Ivan Izhbirdeev** **Spring 2023—Present**
Role: Ph.D. Advisor *Ph.D. Expected 2028/2029*
 - Webpage: <http://cpslab.bu.edu/ivan/>
2. **Francesco Ciralo** **Fall 2022—Present**
Role: Ph.D. Advisor *Ph.D. Expected 2028/2029*
 - Webpage: <http://cpslab.bu.edu/team/fciralo>
3. **Mattia Nicoletta** **Fall 2021—Present**
Role: Ph.D. Advisor *Ph.D. Expected 2026/2027*
 - Webpage: <http://cpslab.bu.edu/mattia>
4. **Weifan Chen** **Fall 2021—Present**
Role: Ph.D. Advisor *Ph.D. Expected 2026/2027*
 - Webpage: <https://weifan-chen-bu.netlify.app/>
5. **Shahin Roozkhosh** **Fall 2018—Present**
Role: Ph.D. Advisor *Ph.D. Expected 2023/2024*
 - Webpage: <http://cs-people.bu.edu/shahin/>
6. **Denis Hoornaert** **Spring 2018—Present**
Role: Ph.D. Co-advisor; Advisor: Prof. Caccamo (TUM) *Ph.D. Expected 2023/2024*
 - Webpage: <https://www.mec.ed.tum.de/en/cps/people/msc-denis-hoornaert/>
7. **Bassel El Mabsout** **Fall 2019—Present**
Role: Ph.D. Advisor *Ph.D. Expected 2024/2025*
 - Webpage: <https://bmabsout.com/>

- | | | |
|-----|---|---|
| 8. | Golsana Ghaemi
Role: <i>Ph.D. Advisor</i>
○ Webpage: http://cpslab.bu.edu/golsana/ | Fall 2019—Present
<i>Ph.D. Expected 2023/2024</i> |
| 9. | Parul Sohal
Role: <i>Ph.D. Co-Advisor; Advisor: Prof. Krieger</i>
○ Webpage: http://cpslab.bu.edu/team/parulsohal/ | Fall 2018—Present
<i>Ph.D. Expected 2023/2024</i> |
| 10. | Ali Raza
Role: <i>Ph.D. Co-Advisor; Advisor: Prof. Krieger</i>
○ Webpage: https://razaaliraza.github.io/ | Fall 2018—Present
<i>Ph.D. Expected 2023/2024</i> |

Former Ph.D. Advisees.....

- | | | |
|----|---|--|
| 1. | William Frederick Koch III
Role: <i>Ph.D. Co-Advisor; Advisor: Prof. Bestavros</i>
○ Thesis: "Flight Controller Synthesis via Deep Reinforcement Learning"
○ Webpage: https://wfk.io/ | Fall 2017—Fall 2019
<i>Ph.D. Fall 2019</i> |
|----|---|--|

Students Advised in Directed Study Courses.....

- | | | |
|---|---|------------------------------------|
| ○ | Golsana Ghaemi
<i>Ph.D. Student</i> | Spring 2023
<i>EC991</i> |
| ○ | Parul Sohal, Mattia Nicolella, Weifan Chen
<i>Ph.D. Student</i> | Spring 2023
<i>CS995</i> |
| ○ | Melody Chan, Xing Zhizhou
<i>MS Students</i> | Spring 2023
<i>CS995</i> |
| ○ | Dave Godfrey, Devon Lewis, Vineet Raju
<i>Undergraduate Students</i> | Spring 2023
<i>CS492</i> |
| ○ | Golsana Ghaemi
<i>Ph.D. Student</i> | Fall 2022
<i>EC991</i> |
| ○ | Parul Sohal
<i>Ph.D. Student</i> | Fall 2022
<i>CS995</i> |
| ○ | Patrick Carpanedo, Melody Chan, Ivan Izhibirdeev
<i>MS Students</i> | Fall 2022
<i>CS995</i> |
| ○ | Agboola Kolade Adegbaye, Devon Lewis
<i>Undergraduate Students</i> | Fall 2022
<i>CS491</i> |
| ○ | Weifan Chen, Bassel El Mabsout
<i>Ph.D. Students</i> | Spring 2022
<i>CS995</i> |
| ○ | Weifan Chen
<i>MS Student</i> | Fall 2020
<i>CS995</i> |
| ○ | Andrew James
<i>BA/MS Student</i> | Spring 2020
<i>CS991</i> |
| ○ | Yifei Feng
<i>Graduate Student</i> | Spring 2020
<i>CS991</i> |
| ○ | Bassel El Mabsout
<i>Ph.D. Student</i> | Fall 2019
<i>CS995</i> |
| ○ | Yifei Feng
<i>Graduate Student</i> | Fall 2019
<i>CS995</i> |
| ○ | Erasmio Tani
<i>Ph.D. Student</i> | Spring 2019
<i>CS995</i> |
| ○ | Chet Powers, Tuna Sogut, Ivan Izhibirdeev
<i>Undergraduate Students</i> | Spring 2019
<i>CS492</i> |
| ○ | Steven Brzozowski, Benjamin Sissons
<i>BA/MS Students</i> | Spring 2019
<i>CS911</i> |

- Francis Zamora, Tuna Sogut, Sabouri Armin
○ Undergraduate Students

Fall 2018
CS491

Students Advised in Independent Projects.....

- Brandon Chen
- Soon Sung Hong
- Ghazal Randhawa
- Keval Khara
- Chuqiao Liang
- Dharmesh Tarapore
- Yash Jain
- James Kunstle
- Kathryn Quirk
- Max Mesirow

High School Research Interns.....

- Abhinav Pomalapally (RISE Internship, June 2021–Dec. 2021)

Presentations and Talks

Conference Presentations.....

1. **“Impact of DM-LRU on WCET: a Static Analysis Approach”** Stuttgart, Germany
Euromicro Conference on Real-Time Systems (ECRTS) July 2019
2. **“A Scheduling Framework for Handling Integrated Modular Avionic Systems on Multicore”** Hsinchu, Taiwan
IEEE Int. Conference on Embedded and Real-Time Systems and Applications (RTCSA) Aug. 2017
3. **“Restart-Based Fault-Tolerance: System Design and Schedulability Analysis”** Hsinchu, Taiwan
IEEE Int. Conference on Embedded and Real-Time Systems and Applications (RTCSA) Aug. 2017
4. **“WCET Derivation under SCE with Explicit Memory Budget Assignment”** Dubrovnik, Croatia
Euromicro Conference on Real-Time Systems (ECRTS) Jun. 2017
5. **“A Real-Time Scratchpad-centric OS for Multi-core Embedded Systems”** Vienna, Austria
IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS) Apr. 2016
6. **“Real-Time Cache Management Framework for Multi-core Architectures”** Philadelphia, PA, USA
IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS) Apr. 2013
7. **“WCET(m) Estimation in Multi-Core Systems using Single Core Equivalence”** Lund, Sweden
Euromicro Conference on Real-Time Systems (ECRTS) July 2015
8. **“Using Traffic Phase Shifting to Improve AFDX Link Utilization”** Amsterdam, Netherlands
ACM International Conference on Embedded and Software (EMSOFT) Oct. 2015
9. **“Reset-Based Recovery for Real-Time Cyber-Physical Systems”** Berlin, Germany
IEEE Emerging Technologies Factory Automation and Appl. Symposium (ETFAs) Sept. 2016
10. **“A Memory Access Detection Methodology for Accurate Workload Characterization”** Hong Kong, China
IEEE Int. Conference on Embedded and Real-Time Systems and Applications (RTCSA) Aug. 2015
11. **“A Low-Power Architecture for High Frequency Sensor Acquisition in Many-DOF UAVs”** Berlin, Germany
IEEE Int. Conference on Cyber-Physical Systems (ICCPS) Apr. 2014
12. **“A Hardware Architecture to Deploy Complex Multiprocessor Scheduling Algorithms”** Chongqing, China
IEEE Int. Conference on Embedded and Real-Time Systems and Applications (RTCSA) Aug. 2014
13. **“Light-PREM: Software Refactoring for Predictable Execution on Embedded Systems”** Chongqing, China
IEEE Int. Conference on Embedded and Real-Time Systems and Applications (RTCSA) Aug. 2014
14. **“On-Chip Control Flow Integrity Check for Real Time Embedded Systems”** Taipei, Taiwan
IEEE Intl. Conference on Cyber-Physical Systems, Networks and Applications (CPSNA) Aug. 2013

Keynotes and Other Talks.....

1. **"Can We Control Time? Software-Shaped Platforms to Control Timeliness"** San Antonio, TX, USA
2nd Real-time and Intelligent Edge Computing Workshop (RAGE'23) May 2023
2. **"CAESAR: Coherence-Aided Elective and Seamless Alternative Routing via on-chip FPGA"** (Online)
Washington University in Saint Louis (Seminar Talk) Apr. 2023
3. **"Can We Control Time? Software-Shaped Platforms to Control Timeliness"** Cambridge, UK
ARM Ltd. Headquarters (Workshop Talk) Mar. 2023
4. **"Can We Control Time? Toward Knowledge-Driven System Management to Control Timeliness"** (Online)
Red Hat Research (Research Days Talk) Oct. 2022
5. **"Fine-grained Resource Profiling and Knowledge-driven Allocation"** Garching, Germany
Technical University of Munich (Seminar Talk) June 2022
6. **"Fine-grained Resource Profiling and Knowledge-driven Allocation"** Braga, Portugal
University of Minho (Seminar Talk) June 2022
7. **"From Memory Partitioning to Management through Fine-grained Profiling and Control"** Grenoble, France
CAPITAL Workshop Keynote June 2022
8. **"From Partitioning to Management: Fine-grained Resource Profiling and Knowledge-driven Allocation"** (Online)
University of California, Berkeley (DREAMS Seminar Talk) Mar. 2022
9. **"Modern Cyber-Physical Systems and the Nightmare of Temporal Interference"** Boston, MA, USA
Boston University (Upsilon Pi Epsilon Student Chapter) Mar. 2022
10. **"Tackling Memory Contention with Fine-grained Profiling and Control"** Boston, MA, USA
Boston University (Systems Seminar) Mar. 2022
11. **"From Partitioning to Management: Tackling Memory Contention with Fine-grained Profiling and Control"** (Online)
Washington University in St. Louis Mar. 2021
12. **"From Partitioning to Management: Tackling Memory Contention with Fine-grained Profiling and Control"** (Online)
SBESC'20 Keynote (K3) Nov. 2020
13. **"Towards A Unified Virtualized Shared Resource Management Infrastructure"** Boston, MA, USA
Boston University Feb. 2020
14. **"Shared Resource Management with Programmable Logic in-the-Middle"** Cambridge, UK
ARM Ltd. Headquarters Nov. 2019
15. **"Safe, Real-Time Software Architectures for Cyber-Physical Systems"** Worcester, MA, USA
Worcester Polytechnic Institute (WPI) Sept. 2019
16. **"Towards Fine-grained Memory Resource Management in Latest-generation MPSoCs"** Munich, Germany
Dept. of Cyber-Physical Systems in Production Engineering July 2019
17. **"Challenges and Opportunities in High-Performance Cyber-Physical Systems"** Manaus, Brazil
1st Digital Fair of Manaus Nov. 2018
18. **"Are You Ready for the 4th Industrial Revolution? Future-proof Cyber-Physical Systems"** Boston, MA, USA
BUILD-Lab Technology Transition Workshop Nov. 2018
19. **"Restart-Based Fault-Tolerance"** York, UK
Workshop on Modelling, Measuring and Managing Uncertainty in CPS July 2018
20. **"Verification of OS-level Cache Management"** Barcelona, Spain
Operating Systems Platforms for Embedded Real-Time applications (OSPERT) July 2018
21. **"Evaluating Memory Subsystem of Configurable Heterogeneous MPSoC"** Barcelona, Spain
Operating Systems Platforms for Embedded Real-Time applications (OSPERT) July 2018
22. **"Hypervisor-level System Protection with SafeVisor"** San Diego, CA, USA
Qualcomm Inc. - Qualcomm Innovation Fellowship May 2016

- | | | |
|-----|---|---|
| 23. | “Toward certifiable avionics platforms: Single Core Equivalent (SCE) - Part 1”
<i>First TCRTS Workshop on Certifiable Multicore Avionics Systems (CMAS)</i> | Seattle, WA, USA
<i>Apr. 2015</i> |
| 24. | “Scratchpad-centric Resource Management”
<i>Hitachi Automotive Ltd. - Technology Transition Workshop</i> | Farmington Hills, MI, USA
<i>May 2015</i> |
| 25. | “Single-Core Equivalence (SCE) Tutorial”
<i>Cyber-Physical Systems Week (CPSWeek)</i> | Berlin, Germany
<i>Apr. 2014</i> |
| 26. | “Workshop on Multi-Core Performance Isolation using Freescale P4080”
<i>Lockheed Martin - Technology Transition Workshop</i> | Denver, CO, USA
<i>Jan. 2013</i> |
| 27. | “A Hands-on Tutorial on Performance Isolation Techniques”
<i>Lockheed Martin - Technology Transition Workshop</i> | Urbana, IL, USA
<i>Apr. 2013</i> |
| 28. | “Automatic Predictability-Oriented Refactoring of Application Code”
<i>WIP – IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS)</i> | Philadelphia, PA, USA
<i>Apr. 2013</i> |

Services to the Community

Executive Committees

- ACM SIGBED Communication Director *Aug. 2019 – Aug. 2022*

Program Committee Member

- *2nd International Workshop on Real-time and Intelligent Edge Computing (RAGE'23)* *May 2023*
- *35th Euromicro Conference on Real-Time Systems (ECRTS'23)* *July 2023*
- *31st International Conference on Real-Time Networks and Systems (RTNS'23)* *June 2023*
- *Design, Automation and Test in Europe Conference (DATE'23)* *Mar. 2023*
- *9th International workshop on Mixed Criticality Systems (WMC'22)* *Dec. 2022*
- *43rd IEEE Real-Time Systems Symposium (RTSS'22)* *Dec. 2022*
- *34th Euromicro Conference on Real-Time Systems (ECRTS'22)* *July 2022*
- *20th International workshop on Worst-Case Execution Time Analysis (WCET'22)* *July 2022*
- *Design Automation Conference (DAC'22)* *July 2022*
- *13th ACM International Conference on Cyber-Physical Systems (ICCCPS'22)* *Apr. 2022*
- *Design, Automation and Test in Europe Conference (DATE'22)* *Mar. 2022*
- *20th ACM International Conference on Embedded and Software (EMSOFT'21)* *Oct. 2021*
- *IEEE Conference on Games (CoG'21)* *Aug. 2021*
- *33rd Euromicro Conference on Real-Time Systems (ECRTS'21)* *July 2021*
- *Design Automation Conference (DAC'21)* *July 2021*
- *ACM Student Research Competition (SRC) Grand Finals 2021* *May 2021*
- *Design, Automation and Test in Europe Conference (DATE'21)* *Mar. 2021*
- *41th IEEE Real-Time Systems Symposium (RTSS'20)* *Dec. 2020*
- *19th ACM International Conference on Embedded and Software (EMSOFT'20)* *Oct 2020*
- *Design Automation Conference (DAC'20)* *July 2020*
- *ACM Student Research Competition (SRC) Grand Finals 2020* *May 2020*
- *Design, Automation and Test in Europe Conference (DATE'20)* *Mar 2020*
- *25th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS'20)* *Apr. 2020*
- *7th International workshop on Mixed Criticality Systems (WMC'19)* *Dec. 2019*
- *40th IEEE Real-Time Systems Symposium (RTSS'19)* *Dec. 2019*
- *18th ACM International Conference on Embedded and Software (EMSOFT'19)* *Oct 2019*
- *25th IEEE Intl. Conf. on Embedded and Real-Time Computing Systems and Applications (RTCSA'19)* *Aug. 2019*
- *7th International Conference on Smart Computing & Communications (ICSCC'19)* *June 2019*
- *5th New England Network and Systems Day (NENS'19)* *Apr. 2019*

- 25th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS'19) Apr. 2019
- COINS 2019 – Special Session on Critical Systems Design May 2019
- RTSS 2018 – Brief Presentations Session Dec. 2018
- RTSS@Work 2018 – Demo Session Dec. 2018
- 6th International workshop on Mixed Criticality Systems (WMC'18) Dec. 2018
- 39th IEEE Real-Time Systems Symposium (RTSS'18) Dec. 2018
- 24th IEEE Intl. Conf. on Embedded and Real-Time Computing Systems and Applications (RTCSA'18) Aug. 2018
- 18th ACM International Conference on Embedded and Software (EMSOFT'18) Oct 2018
- 21st Euromicro Conference on Digital System Design (DSD'18) Aug. 2018
- 15th IEEE International Conference on Embedded Software Systems (ICESS'18) Jun. 2018
- 24th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS'18) Dec. 2017
- 14th Workshop on Operating Systems Platforms for Embedded Real-Time Applications (OSPERT'18) Apr. 2018
- WiP Session at CSI Symposium on Real-Time and Embedded Systems and Technologies (RTEST'18) Feb. 2018
- 10th Junior Researcher Workshop on Real-Time Computing (JRWRTC) Sept. 2016

Co-organizer.....

- **Track 1 Deputy Chair** **Location TBA**
- 44th IEEE Real-Time Systems Symposium (RTSS) 2023
- **Chair** **Vienna, Austria**
- 17th Workshop on Operating Systems Platforms for Embedded Real-Time Applications (OSPERT) 2023
- **Track 1 Deputy Chair** **San Antonio, TX, USA**
- 29th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS) 2023
- **Publicity Chair** **Vasteras, Sweden, USA**
- 25th IEEE International Symposium On Real-Time Distributed Computing (ISORC) 2022
- **Artifact Evaluation Chair** **Milan, Italy**
- 28th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS) 2022
- **Chair** **Modena, Italy**
- 16th Workshop on Operating Systems Platforms for Embedded Real-Time Applications (OSPERT) 2022
- **Publicity Chair** **Houston, TX, USA**
- 41st IEEE Real-Time Systems Symposium (RTSS) 2021
- **Co-organizer** **Nashville, TN, USA**
- 2nd ACM/SIGBED Student Research Competition (SRC) at CPS-IoT Week 2021
- **Publicity Chair** **Nashville, TN, USA**
- 27th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS) 2021
- **Web Chair** **Nashville, TN, USA**
- 11th ACM/IEEE International Conference on Cyber-Physical Systems (ICCPS) 2021
- **Co-chair** **Modena, Italy**
- 16th annual workshop on Operating Systems Platforms for Embedded Real-Time (OSPERT) 2020
- **Co-organizer** **Sydney, Australia**
- 1st ACM Student Scholars Program at CPS-IoT Week 2020
- **Web Chair** **Sydney, Australia**
- 10th ACM/IEEE International Conference on Cyber-Physical Systems (ICCPS) 2020
- **Co-organizer** **New York, NY, USA**
- 1st ACM/SIGBED Student Research Competition (SRC) at Embedded Systems Week (ESWEEK) 2019
- **Web Chair** **Montreal, QC, Canada**
- 25th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS) 2019
- **Co-organizer for Conference** **Boston, MA, USA**
- 4th New England Networking and Systems Day (NENS) 2017
- **Co-organizer for TCRTS CPSWeek Tutorial** **Pittsburgh, PA, USA**
- 2nd TCRTS Workshop on Certifiable Multicore Avionics and Automotive Systems (CMAAS) 2017

- **Co-organizer for ACM/IEEE CPSWeek Tutorial** **Berlin, Germany**
Single Core Equivalent (SCE) Architecture Framework for Safety-critical Multi-core Systems 2014

Session Chair

- **IEEE Real-Time Systems Symposium (RTSS)** **Houston, TX, USA**
Session 14 - DAG Scheduling 2022
- **IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS)** **Online**
Session 1 - Scheduling for Parallelism 2020
- **ACM International Conference on Embedded Software (EMSOFT)** **New York, USA**
Session 3C - Timing, Scheduling and Parallel Execution 2019
- **IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS)** **Montreal, Canada**
Session 7 - Scheduling and Synchronization 2019
- **ACM International Conference on Embedded Software (EMSOFT)** **Amsterdam, The Netherlands**
Session 6 - Energy Efficiency and Security 2015

Panelist

- **Topic: Challenges in Explainability of Real-Time Systems** **Houston, TX, USA**
1st International Workshop on Explainability of Real-time Systems and their Analysis (ERSA) 2022

Journal Reviews

- *Journal on Systems Research (JSYS)* 2021
- *IEEE Robotics and Automation Letters (RA-L/IROS)* 2021
- *IEEE Embedded Systems Letters (ESL)* 2021
- *IEEE Transactions on Aerospace and Electronic Systems (TAES)* 2021
- *Springer Design Automation for Embedded Systems (DAEM)* 2019, 2020
- *ACM Transactions on Architecture and Code Optimization (TACO)* 2020
- *International Journal of Computers and Applications (IJCA)* 2020
- *ACM Computing Surveys (ACM CSUR)* 2018, 2021
- *Public Library of Science ONE (PLoS ONE)* 2018
- *IEEE Transactions on Computers (TC)* 2017, 2018, 2019, 2021, 2022, 2023
- *Springer Real-Time Systems Journal (RTSJ)* 2016, 2017, 2018, 2019, 2021, 2022, 2023
- *ACM Transactions on Cyber-Physical Systems (TCPS)* 2016, 2020
- *ACM Transactions on Embedded Computing Systems (TECS)* 2017, 2018, 2021, 2022, 2023
- *ACM Transactions on Modeling and Performance Evaluation of Computing Systems (TOMPECS)* 2018

Secondary Reviewer

- *Springer Real-Time Systems Journal (RTSJ)* 2016
- *ACM Transactions on Embedded Computing Systems (TECS)* 2014
- *IEEE Transactions on Industrial Informatics (TII)* 2013, 2017
- *ACM/IEEE Symposium on Embedded Systems For Real-Time Multimedia (ESTIMedia)* 2012, 2013, 2014
- *IEEE International Conference on Cyber-Physical Systems (ICCP)* 2013, 2015, 2016, 2017
- *ACM Conference on Languages, Compilers, and Tools for Embedded Systems (LCTES)* 2015
- *IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS)* 2013, 2014, 2016
- *IEEE Real-Time Systems Symposium (RTSS)* 2014, 2015
- *IEEE Intl. Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA)* 2016, 2017
- *Euromicro Conference on Real-Time Systems (ECRTS)* 2014
- *Design Automation Conference (DAC)* 2017
- *IEEE Emerging Technologies Factory Automation and Applications Symposium (ETF)* 2017

Internal Services

Comittee Member at Boston University.....

- *STEM Research Committee* *Fall 2022—Spring 2023*
College-level committee to improve support for externally-funded STEM research.
- *Ph.D. Thesis Defense – Faculty Committee Member* *Spring 2023*
Candidate: Ali Raza
- *Ph.D. Thesis Defense – Faculty Committee Member* *Spring 2023*
Candidate: Showan Asyabi
- *Ph.D. Depth Exam – Faculty Committee Member* *Fall 2022*
Candidate: Shahin Roozkhosh
- *Ph.D. Depth Exam – Faculty Committee Member* *Fall 2022*
Candidate: Parul Sohal
- *Ph.D. Depth Exam – Faculty Committee Member* *Fall 2022*
Candidate: Bassel El Mabsout
- *Ph.D. Thesis Proposal – Faculty Committee Member* *Summer 2022*
Candidate: Showan Asyabi
- *Ph.D. Thesis Defense – Faculty Committee Member* *Summer 2022*
Candidate: Ahmad (Sanan) Golchin
- *Ph.D. Thesis Defense – Faculty Committee Member* *Summer 2022*
Candidate: Soham Sinha
- *Ph.D. Thesis Defense – Faculty Committee Chair* *Spring 2022*
Candidate: Siddharth Mysore
- *Ph.D. Thesis Defense – Faculty Committee Member* *Spring 2022*
Candidate: Emine Ugur Kaynar
- *Ph.D. Thesis Proposal – Faculty Committee Member* *Spring 2022*
Candidate: Golsana Ghaemi
- *Ph.D. Thesis Proposal – Faculty Committee Member* *Spring 2022*
Candidate: Siddharth Mysore
- *Ph.D. Depth Exam – Faculty Committee Member* *Spring 2022*
Candidate: Yara Awad
- *Faculty Search Committee Member* *Fall 2021*
- *Ph.D. Depth Exam – Faculty Committee Member* *Fall 2021*
Candidate: Showan Asyabi
- *Ph.D. Depth Exam – Faculty Committee Member* *Fall 2021*
Candidate: Ali Raza
- *Ph.D. Oral Exam – Faculty Committee Member* *Fall 2021*
Candidate: Siddharth Mysore
- *Ph.D. Thesis Proposal – Faculty Committee Member* *Fall 2021*
Candidate: Ahmad (Sanan) Golchin
- *Ph.D. Thesis Proposal – Faculty Committee Member* *Fall 2021*
Candidate: Soham Sinha
- *PhD Student Search & Filtering Engine* *Fall 2019*
- *Extension for BU Faculty Link to Assess Course Prerequisite of Students in CS Courses* *Fall 2019*
- *Ph.D. Depth Exam – Faculty Committee Member* *Fall 2019*
Candidate: Ahmad (Sanan) Golchin
- *Ph.D. Thesis Proposal – Faculty Committee Member* *Fall 2019*
Candidate: Emine Ugur Kaynar
- *Ph.D. Thesis Defense – Faculty Committee Member* *Fall 2019*
Candidate: Wil Koch
- *Graduate Initiation Seminar (co-organizer)* *Spring 2019*

- *Ph.D. Depth Exam – Faculty Committee Member* *Fall 2018*
Candidate: Soham Sinha
- *Ph.D. Thesis Proposal – Faculty Committee Member* *Fall 2018*
Candidate: Wil Koch
- *Ph.D. Thesis Defense – Faculty Committee Member* *Fall 2018*
Candidate: Zhuoqun (Tom) Cheng
- *Faculty Search Committee Member* *Fall 2018*
- *PhD Admissions Committee Member* *Fall 2018*
- *PhD Admissions Committee Member* *Fall 2017*

Professional Experience

- **Co-founder** **Boston, MA**
Minerva Systems SRL *2021-Present*
 - Innovative startup for the design and simplified deployment of predictable AI-enabled, multiple-criticality applications on next-generation embedded systems
 - More info available at: <http://minervasys.tech/>
- **Co-founder** **Urbana, IL**
AI Volo LLC. *2016-Present*
 - Development of fully integrated data acquisition and sensor fusion system for UAVs
 - Performed custom PCB, firmware and OS development
 - Developed browser-based configuration interface to simplify in-the-field deployment
 - More info available at: <http://www.alvolo.us>
- **Ph.D. Intern** **Pisa, Italy**
Evidence Inc. *June-Aug. 2014*
 - Porting of RTOS to new-generation multi-core micro-controller (Freescale MPC5777M)
 - Augmented RTOS to support DMA-assisted task loading and scheduling
 - Evaluation of achievable performance and timing properties of augmented RTOS
- **Co-founder and CIO** **Rome, Italy**
ShowOn LLC. *2012-2013*
 - Ground-up development of a vertical social networking platform with LAMP platform
 - System administration, development team recruitment, task assignment and progress assessment
 - Data analysis of the highly segmented user base – about 30000 users
 - Design of interaction with existing services via APIs to centralize content management

Technical skills

- **Programming/Scripting:** C, C++, ASM (IA32, AMD64, PowerPC, ARM), Java, Bash, Python, Makefile
- **Experienced in Linux Kernel development,** ARM-based and PowerPC-based platforms, Xilinx Zynq-7000 & UltraScale+, Microchip PIC18/32, Freescale MPC56xx and MPC57xx, Arduino, ArduPilot, TI MSP
- **Hardware Debugging:** Lauterbach PowerDebug & PowerTrace, GreenHills SuperTrace Probe, Xilinx Integrated Logic Analyzer
- **Hardware Design:** Verilog, VHDL
- **Web Development:** PHP, SQL, JavaScript, Node.js, Handlebars, AngularJS

Language Skills

Italian: Native speaker
English: Fluent
Turkish: Intermediate

References

References available upon request.