Juan A. Colmenares, Ph.D.

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Education

- **Post-doctoral Scholar**. University of California, Berkeley. (September 2009 – July 2012)
  Advisor: Prof. John D. Kubiatowicz.
- **Ph.D. in Electrical and Computer Engineering**. University of California, Irvine. (March 2009)
  Dissertation: Derivation of Service-time Bounds of Methods in Time-triggered Message-triggered Objects.
  Advisor: Prof. Kwang-Hae (Kane) Kim†
- **M.S. in Applied Computing**. University of Zulia (LUZ), Venezuela. (November 2001)
  Thesis: Development of an Efficient Bayesian Global Optimization Algorithm and its Integration into a Distributed Computing Environment.
  Advisor: Prof. Salvador Pintos.
- **B.S. in Electrical Engineering**. University of Zulia (LUZ), Venezuela. (December 1997)
  Ranking: #1 among 58 graduates.

Research Interests

- Data management and analytics
- Scalable and latency-sensitive systems
- Operating and distributed systems
- Edge and cloud computing
- Adaptive resource allocation
- Networked cyber-physical systems

Work Experience

Staff Software Engineer (April 2018 – Present)

LinkedIn (Sunnyvale, CA)

- Develops a new distributed graph database for LinkedIn's Economic Graph, designed to serve declarative queries at high throughput and with low latency.

Senior Staff Research Engineer (June 2012 – April 2018)

Samsung Research (Mountain View, CA)

- Was the **tech lead** of a team of eight high-caliber research engineers working on systems for Smart Homes, the Internet of Things (IoT), and Edge and Cloud Computing.
- Researched:
  - **Storage platforms for IoT data** (e.g., time series and multi-dimensional sensor data) with emphasis on acceleration of data ingestion and data analytics workloads.
  - **Systems software for multi-/many-core platforms** with focus on scalability, QoS guarantees, and adaptive resource management.
  - **Power consumption models for virtualized workloads on Cloud infrastructures**.
- Developed **Tera-Triple**, a large-scale factual knowledge base. The project's goals were: 1) fast and scalable data ingestion, and 2) low query latency to maintain an acceptable quality of experience for users.
- Developed **KV-Cache**, a scalable high-performance web-object caching solution. Based on a micro-kernel operating system, it offers scalability and performance that significantly exceeds those of its Linux-based counterpart (Memcached).
- Designed and implemented a scalable object-recognition application to demonstrate a micro-kernel OS prototype.
- In 2013, was an industrial researcher for Samsung in the Ubiquitous Swarm Lab at UC Berkeley.

- Supervised 5 Ph.D. student interns.

Postdoctoral Scholar (September 2009 - June 2012)

Parallel Computing Laboratory (Par Lab). EECS Department. University of California, Berkeley

- Developed **Tessellation OS**, a new many-core operating system focused on enforcing resource guarantees for client applications. The primary goal was to provide adequate support for a simultaneous mix of high-throughput parallel, real-time, and interactive applications.
  - Implemented time multiplexing support for resource partitions, including a gang scheduling algorithm and lock-free inter-partition communication channels.
  - Incorporated support for user-level preemptive and cooperative scheduling (within partitions).
  - Developed a windowing system capable of exploiting task parallelism and providing response time guarantees.
  - Built Tessellation's adaptive resource-management architecture.
- Worked on **computer music parallel applications** with stringent real-time requirements, a collaborative effort with Prof. David Wessel[†] and the Center for New Music and Audio Technologies (CNMAT) at UC Berkeley.
  - Developed **concert-oriented, live-performance music applications** on top of Tessellation OS. These real-time applications involved computationally-intensive audio synthesis, sound reproduction through speaker arrays, and rich responsive gestural input.
- Co-supervised 2 Ph.D. students, 3 undergraduate students, and 1 visiting researcher.

Senior Software Engineer (February 2009 - September 2009)

Candelis, Inc. (Irvine, CA)

- Led the design and implementation of the new administration tool set for the ImageGrid PACS, the Candelis storage system for medical digital images.
- Implemented the server-side components of the auditing sub-system of the ImageGrid PACS.
- Integrated the Candelis DICOM viewer with Allscripts, an Electronic Medical Record (EMR) system.

Graduate Student Researcher (September 2004 - December 2008)

EECS Department. School of Engineering. University of California, Irvine

Research

- Developed a **multi-party video-conference application**, which is able to tolerate changes in network conditions and provide the best possible quality of service (QoS) under such a variable environment.
- Built a **QoS-support software architecture**, based on the TMO (Time-triggered Message-Triggered Object) programming scheme, for facilitating development of QoS-aware real-time distributed applications.
- Implemented a **wireless digital music ensemble system**. It consists of 4 distributed and highly synchronized player nodes that detect the listener's location when she claps, and compensate the propagation delays and attenuation of sound in the air to make the music reach the listener in a well synchronized and equalized form.
- Devised **lock-free inter-thread communication mechanisms for various producer-consumer scenarios**. The mechanisms are adaptations of the *Non-Blocking Buffer* (NBB), which is a variation of the traditional circular buffer that enables data passing between a single producer thread and a single consumer thread without causing any party to experience blocking.
- Proposed a hybrid approach that combines static analysis and measurements for **deriving tight execution-time bounds of program segments**, and developed supporting prototype tools for Linux.
- Participated in the development of **RTZen**, a CORBA implementation on real-time Java (RTSJ).

Teaching

- In Spring 2008, taught several class sessions of the **graduate course in Distributed Software Architecture and Design** (EECS 219). Gave lectures on CORBA, Real-time CORBA, and Web Services. Also prepared and graded the mid-term exam, final exam, and homework assignments.
- In Winter 2008, prepared and graded the mid-term exam, final exam, and homework assignments for the **graduate course in Real-time Systems** (EECS 223).

- Coordinated and taught a **course on TMO programming** to graduate students from Sogang University, Korea (June 2008) and Konkuk University, Korea (July 2007). The course duration was 20 hours and included lectures and laboratory sessions.

Faculty Member (1998 - 2009)

Applied Computing Institute. School of Engineering. University of Zulia (Venezuela)

Positions

- Associate Professor, 2006 - 2009 (in absentia).
- Director, 2003 - 2004 (as for 2004, the youngest director in the School's history).
- Aggregate Professor, 2003 - 2006 (in absentia since September 2004).
- Assistant Professor 2002 - 2003.
- Instructor and Research Assistant, 1998 - 2002.

Research (1998 - 2004)

- Designed and implemented a **component-based software architecture for developing industrial automation applications in the oil industry**.
- Developed a **Bayesian global optimization algorithm** and applied it to the estimation of the distributions of permeability and porosity in heterogeneous and multiphase petroleum reservoirs by matching the static and dynamic data available.
- Developed a **CORBA-based software framework** for the analysis and optimal design of complex engineered systems.
- Implemented Java class libraries of **combinatorial algorithms**, **local and global optimization algorithms, and evolutionary multi-objective optimization algorithms**.

Teaching (1998 - 2004)

- Between 2001 and 2004, taught in the **M.S. Program in Applied Computing** and had full responsibility for all aspects of the following courses: a) *Data Structures and Algorithms* (2 semesters), b) *Distributed Systems* (2 semesters), c) *Non-Linear Programming* (1 semester), and d) *Introduction to Neural Networks, Genetic Algorithms, and Fuzzy Logic* (1 semester).
- In 2003, was a **member of the committee for the accreditation of the M.S. Program in Applied Computing** and participated in the reformulation of the program's curriculum. Thanks to this effort, the Ministry of Higher Education accredited the program in 2005.
- Co-formulated, co-managed, and was an instructor in the **extension program** "***Integration Platforms for the Oil and Gas Exploration and Production Industry***." The program consisted of 6 modules and targeted professionals working in control, automation, and informatics in the Venezuelan oil and gas industry. In 2003 and 2004, 50+ professionals from different regions of the country participated in the program.
- Co-formulated and taught the **module** "***System Integration in the Oil and Gas Exploration and Production Industry***" of the instructional extension program "*Integrated Oil Reservoir Management for Automation, Informatics, and Telecommunication Professionals*".
- In 2003, taught an **introductory course on Unix** to Venezuelan young researchers participating in the *Research Training Program in Genetics of Common Heritable Disorders in Venezuela* (Columbia Genome Center and University of Zulia).
- In 2000, completed the **Teaching Development Program** of the School of Humanities and Education at the University of Zulia. The program consisted of the following 36-hour courses: a) *Teaching and Learning Process*, b) *Instructional Strategies and Media*, c) *Assessment and Evaluation of Student Learning*, d) *Curriculum Design*, e) *Introduction to Higher-Education Management*, and f) *Strategic Planning in Higher Education*.
- Supervised 1 M.S. student and 5 undergraduate students.
- Participated in 4 Master's thesis committees.

Consulting (1998 - 2004)

While employed at the Applied Computing Institute, participated in the following projects:

- EJB-based synthetic build-up test application: design, implementation, and deployment. Client: PDVSA. 2004.

- Implementation of EJB components for accessing the PI System® (an operational database system from OSI Software, Inc.). Clients: PDVSA and INTESA. 2002.
- Visualization of oil production data using mobile devices: design and implementation. Clients: PDVSA and INTESA. 2002.
- Design and implementation of a smartcard based pre-payment system for students' public transportation. Client: Ministry of Infrastructure (Venezuela). 1999.
- Integration of voice, video and data over TCP/IP networks for traffic supervision at the Lake Maracaibo Bridge: system design and deployment. Client: Government of the State of Zulia (Venezuela). 1998.

Notes:

- PDVSA (Petróleos de Venezuela, S.A.) is the Venezuelan state-owned petroleum company.
- INTESA was a joint venture between PDVSA and SAIC (Science Applications International Corporation), created in 1996 and ended in 2004.

Publications

Refereed Papers

1. **Voice enabling mobile applications with UIVoice**. Ahmad Bisher Tarakji, Jian Xu, Juan A. Colmenares, and Iqbal Mohomed. In Proc. of the 1st Int'l Workshop on Edge Systems, Analytics and Networking (EdgeSys'18). Co-located with ACM MobiSys'18. Munich, Germany. June 2018.
2. **A single-node datastore for high-velocity multidimensional data**. Juan A. Colmenares, Reza Dorrigiv, and Daniel G. Waddington. In Proc. of the 2017 IEEE Int'l Conference on Big Data (Big Data 2017). Boston, MA, USA. December 2017.
3. **Power consumption models for multi-tenant server infrastructures**. Matteo Ferroni, Andrea Corna, Andrea Damiani, Rolando Brondolin, Juan A. Colmenares, Steven Hofmeyr, John D. Kubiatowicz, and Marco D. Santambrogio. ACM Transactions on Architecture and Code Optimization (TACO). Volume 14 (4). 2017
4. **Efficient detection of points of interest from georeferenced visual content**. Ying Lu and Juan A. Colmenares. In Proc. of the 6th ACM SIGSPATIAL Int'l Workshop on Analytics for Big Geospatial Data (BigSpatial 2017). Los Angeles Area, CA. November 2017.
5. **Time-sharing redux for large-scale HPC systems**. Steven Hofmeyr, Costin Iancu, Juan A. Colmenares, Eric Roman and Brian Austin. In Proc. of the 18th IEEE Int'l Conference on High Performance Computing and Communications (HPCC 2016). Sydney, Australia. December 2016.
6. **Enabling power-awareness for the Xen Hypervisor**. Matteo Ferroni, Juan A. Colmenares, Steven Hofmeyr, John D. Kubiatowicz, and Marco D. Santambrogio. In Proc. of the 2016 Embedded Operating System Workshop (EWiLi'16). Co-located with the Embedded Systems Week. Pittsburgh, PA, USA. October 2016.
7. **Enabling performance exploration and analysis for multi-parametric systems**. Younghwan Go and Juan A. Colmenares. In Proc. of the 2016 Embedded Operating System Workshop (EWiLi'16). Co-located with the Embedded Systems Week. Pittsburgh, PA, USA. October 2016.
8. **NbQ-CLOCK: A non-blocking queue-based CLOCK algorithm for web-object caching**. Gage Eads and Juan A. Colmenares. In Proc. of the 2014 Int'l Conference on Internet Computing and Big Data (ICOMP'14). Las Vegas, Nevada, USA. July 2014.
9. **A scalable high-performance web-object cache for manycore**. Daniel G. Waddington, Juan A. Colmenares, Jilong Kuang, and Fengguan Song. In Proc. 6th IEEE/ACM Int'l Conference on Utility and Cloud Computing (UCC 2013). Dresden, Germany. December 2013. [**Runner-up for the Best Paper Award**]
10. **Tessellation: Refactoring the OS around Explicit Resource Containers with Continuous Adaptation** (Invited Paper). Juan A. Colmenares, Gage Eads, Steven Hofmeyr, Sarah Bird, Miquel Moretó, David Chou, Brian Gluzman, Eric Roman, Davide B. Bartolini, Nitesh Mor, Krste Asanović, and John Kubiatowicz. In Proc. of the 50th Annual Design Automation Conference (DAC 2013). Special Session: The Future of Operating Systems for Embedded Systems and Software. Austin, Texas, USA. June 2013.
11. **Juggle: Addressing extrinsic load imbalances in SPMD applications on multicore computers.** Steven Hofmeyr, Juan A. Colmenares, Costin Iancu, and John Kubiatowicz. Cluster Computing, 16(2), pp. 299-319. 2013.

12. **A multi-core operating system with QoS guarantees for network audio applications.** Juan A. Colmenares, Nils Peters, Gage Eads, Ian Saxton, Israel Jacques, John D. Kubiatowicz, and David Wessel. Journal of the Audio Engineering Society, 61(4), pp.174-184. 2013.
13. **A soft real-time, parallel GUI service in Tessellation many-core OS.** Albert Kim, Juan A. Colmenares, Hilfi Alkaff, and John Kubiatowicz. In Proc. of the 27th Int'l Conference on Computers and Their Applications (CATA 2012). Las Vegas, Nevada, USA. March 2012. [**Best Paper Award**]
14. **Real-time music applications on an experimental operating system for multi-core processors**. Juan A. Colmenares, Ian Saxton, Rimas Avizienis, Eric Battenberg, Nils Peters, Krste Asanović, John Kubiatowicz, and David Wessel. In Proc. of the 2011 Int'l Computer Music Conference (ICMC'11). Huddersfield, England. July 2011.
15. **Juggle: Proactive load balancing on multicore computers**. Steven Hofmeyr, Juan A. Colmenares, Costin Iancu, and John Kubiatowicz. In Proc. of the 20th Int'l ACM Symposium on High-Performance Parallel and Distributed Computing (HPDC-20). San Jose, CA, USA. June 2011.
16. **Real-time multicast and memory replication channels with delay bound error detection and retry capabilities**. Jing Qian, Kane Kim, Zhen Zhang, Juan A. Colmenares, Kyung-Deok Moon, Jun-Hee Park, Doo-Hyun Kim, and Kee-Wook Rim. In Proc. of the 14th IEEE Int'l Symposium on Object/Component/Service-oriented Real-time Distributed Computing (ISORC 2011). Newport Beach, CA, USA. March 2011.
17. **Resource management in the Tessellation Manycore OS**. Juan A. Colmenares, Sarah Bird, Henry Cook, Paul Pearce, David Zhu, John Shalf, Krste Asanović, and John Kubiatowicz. In Proc. of the 2nd USENIX Workshop on Hot Topics in Parallelism (HotPar'10). Berkeley, CA, USA. June 2010.
18. **Real-time component based software architecture for QoS-adaptive networked multimedia applications**. Juan A. Colmenares, K. H. (Kane) Kim, Chaedeok Lim, Zhen Zhang, and Doo-Hyun Kim. In Proc. of the 13th IEEE Int'l Symposium on Object/Component/Service-oriented Real-time Distributed Computing (ISORC 2010). Parador de Carmona, Seville, Spain. May 2010.
19. **Experimental evaluation of a hybrid approach for deriving service-time bounds of methods in real-time distributed computing objects**. Juan A. Colmenares, K. H. (Kane) Kim, and Doo-Hyun Kim. In Proc. Int'l Embedded Systems Symposium 2009 (IESS 2009). Schloß Langenargen, Germany. September 2009.
20. **Incorporation of security mechanisms into the TMO scheme for real time distributed computing**. K. H. (Kane) Kim, Juan A. Colmenares, Moon-Cheol Kim, Zhen Zhang, Qian Zhou, Doo Hyun Kim, and Stephen S. Yau. In Proc. of the First Int'l Workshop on Software Technologies for Future Dependable Distributed Systems (STFSSD 2009). Tokyo, Japan. March 2009.
21. **Realization of an adaptive distributed sound system based on global-time-based coordination and listener location**. Emmanuel Henrich, Juan A. Colmenares, Keizo Fujiwara, Chansik Im, K. H. (Kane) Kim, and Liangchen Zheng. In Proc. of the 11th IEEE Int'l Symposium on Object/Component/Service-oriented Real-time Distributed Computing (ISORC 2008). Orlando, Florida, USA. May 2008.
22. **Measurement techniques for using a hybrid approach in deriving tight execution time bounds of program segments in fully-featured processors**. Juan A. Colmenares, Chansik Im, K. H. (Kane) Kim, Raymond Klefstad, and Chae-Deok Lim. In Proc. of the 14th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS 2008), St. Louis, MO, USA. April 2008.
23. **Compadres: a lightweight component middleware framework for composing distributed, real-time, embedded systems with real-time Java**. Jie Hu, Shruti Gorappa, Juan A. Colmenares, and Raymond Klefstad. In Proc. of the ACM/IFIP/USENIX 8th Int'l Middleware Conference (Middleware 2007). Newport Beach, CA, USA. November 2007.
24. **Efficient adaptations of the Non-Blocking Buffer for event message communication between real-time threads**. K. H. (Kane) Kim, Juan A. Colmenares, and Kee-Wook Rim. In Proc. of the 10th IEEE Int'l Symposium on Object/Component/Service-oriented Real-time Distributed Computing (ISORC 2007). Satorini Island, Greece. May 2007.
25. **Identification and removal of program slice criteria for code size reduction in embedded systems**. Mark Panahi, Trevor Harmon, Juan A. Colmenares, Shruti Gorappa, and Raymond Klefstad. In Proc. Int'l Embedded Systems Symposium 2007 (IESS 2007). Irvine, California, USA. May 2007.
26. **Maximizing concurrency and analyzable timing behavior in component-oriented real-time distributed computing application systems**. K. H. (Kane) Kim and Juan A. Colmenares. KIISE Journal of Computing Science and Engineering, 1(1), 2007.
27. **A software architecture for the development of industrial automation high-level applications in the petroleum industry**. Guido Urdaneta, Juan A. Colmenares, et al. Computers in Industry, 58(1), 2007, pp. 35-45.

28. **Recent additions on the application programming interface of the TMO Support Middleware**. K. H. (Kane) Kim, Juan A. Colmenares, Liangchen Zheng, Sheng Liu, Qian Zhou and Moon-Cheol Kim. In Proc. of the Monterey Workshop 2006. LNCS 4888. Paris, France. October 2006.
29. **A component framework for real-time Java**. Juan A. Colmenares, Shruti Gorappa, Mark Panahi, and Raymond Klefstad. In Proc. of the 12th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS 2006). Work-in-Progress Session. San Jose, California, USA. April 2006.
30. **RTZen: highly predictable, real-time Java middleware for distributed and embedded systems**. Krishna Raman, Yue Zhang, Mark Panahi, Juan A. Colmenares, Raymond Klefstad and Trevor Harmon. In Proc. of the ACM/IFIP/USENIX 6th Int'l Middleware Conference (Middleware 2005). Grenoble, France. December 2005.
31. **Patterns and tools for achieving predictability and performance with real-time Java**. Krishna Raman, Yue Zhang, Mark Panahi, Juan A. Colmenares, and Raymond Klefstad. In Proc. of the 11th IEEE Int'l Conference on Real-Time and Embedded Computing Systems and Applications (RTCSA 2005). Hong Kong, China. August 2005.
32. **Tool-based configuration of real-time CORBA middleware for embedded systems**. Shruti Gorappa, Juan A. Colmenares, Hojjat Jafarpour, and Raymond Klefstad. In Proc. of the 8th IEEE Int'l Symposium on Object-oriented Real-time Distributed Computing (ISORC 2005). Seattle, Washington, USA. May 2005.
33. **Efficient global optimization algorithm with coupled additive model**. Juan Colmenares Diaz and Salvador Pintos Mantegani. Ciencia, 13(2), 2005, pp.193-204. [**in Spanish**]
34. **Component-based software development**. Jonas A. Montilva, Nelson Arapé, and Juan A. Colmenares. In Proc. 4th Congress of Automation and Control (CAC 2003). Mérida, Venezuela. November 2003. [**in Spanish**]
35. **On the development of an enhanced least-loaded strategy for the CORBA load balancing and monitoring service**. Nelson Arapé, Juan A. Colmenares and Nestor V. Queipo. In Proc. of the ISCA 16th Int'l Conference on Parallel and Distributed Computing Systems (PDCS 2003). Reno, Nevada, USA. August 2003.
36. **A wireless production data visualization system for the oil and gas industry**. Guido Urdaneta, Juan A. Colmenares, Nelson Arapé, Nestor V. Queipo, Carlos Arévalo, Carlos Gonzalez and José Quintero. In Proc. of the 6th Int'l Conference on Petroleum Data Integration e-Commerce and Data Management. Houston, Texas, USA. April 2002.
37. **A CORBA and web technology based framework for the analysis and optimal design of complex systems in the oil industry**. Carlos Arévalo, Juan A. Colmenares, Nestor V. Queipo, Nelson Arapé and Jorge Villalobos. *Enterprise Information Systems III*. J.Filipe, B. Sharp and P. Miranda (Editors). Kluwer Academic Publishers, Dordrecht, The Netherlands. April 2002. ISBN: 1-4020-0563-6.
38. **Surrogate modeling-based optimization for the integration of static and dynamic data into a reservoir description**. Nestor V. Queipo, Salvador Pintos, Nestor Rincón, Nemrod Contreras and Juan A. Colmenares. Journal of Petroleum Science and Engineering, 35(3-4), 2002, pp.167-181.
39. **Component-based automation architecture for continuous process industries**. Guido Urdaneta, Juan Colmenares, Carlos Arévalo, Nestor V. Queipo, Jorge Villalobos and Seida Angel. In Proc. of the 5th EDA Int'l Conference on Engineering Design and Automation. Las Vegas, Nevada, USA. August 2001
40. **A CORBA and web technology based framework for the analysis and optimal design of complex systems**. Carlos Arévalo, Juan A. Colmenares, Nelson Arapé and Nestor V. Queipo. In Proc. of the 12th IASTED Int'l Conference on Parallel and Distributed Computing and Systems. Las Vegas, Nevada, USA. November 2000.
41. **Integration of voice, video, and data over TCP/IP networks for traffic supervision and control applications at the Maracaibo Lake Bridge**. Carlos Arévalo, Juan A. Colmenares, Gustavo Oquendo, Nestor V. Queipo and Cosimo Stufano. In Proc. of the 5th National Congress of Multimedia and Videoconference. Maracaibo, Zulia, Venezuela. October 1999. [**in Spanish**]

Technical Reports

1. **Building an adaptive operating system for predictability and efficiency**. Gage Eads, Juan A. Colmenares, Steven Hofmeyr, Sarah Bird, Davide Bartolini, David Chou, Brian Gluzman, Krste Asanović, and John D. Kubiatowicz. EECS Department. University of California, Berkeley. Technical Report No. UCB/EECS-2014-137. July 7, 2014.
2. **A scalable high-performance in-memory key-value cache using a microkernel-based design**. Daniel G. Waddington, Juan A. Colmenares, Jilong Kuang, and Reza Dorrigiv. Computer Science Laboratory. Samsung Research America - Silicon Valley. Technical Report No. TR-SRA-SV-CSL-2014-1. January 31, 2014.

Patents

1. **Caching architecture for packet-form in-memory object caching**. Jilong Kuang, Daniel G. Waddington and Juan Colmenares. Patent US9860332B2. January 2018.
2. **Non-blocking queue-based CLOCK algorithm for web-object caching.** Gage W. Eads and Juan A. Colmenares. Patent US9665658B2. May 2017.

Invited Presentations

1. **Ingestion, indexing and retrieval of high-velocity multidimensional sensor data on a single node**. Seminar Series of the CS Department at the University of California, Irvine. January 12, 2018.
2. **Will Computer Systems with Performance Guarantees Ever Go Mainstream? Keynote Speech**. The 15th IEEE Int'l Symposium on High Assurance Systems Engineering (HASE 2014). Miami, FL, USA. January 2014.
3. **Refactoring the OS around Explicit Resource Containers with Continuous Adaptation.** End of the Par Lab. University of California, Berkeley. May 30, 2013.
4. **Tessellation OS: Building a real-time, responsive, high-throughput client OS for many-core architectures.**
   - Samsung Research America (SRA). February 2012.
   - Computing Sciences Seminars. Lawrence Berkeley National Laboratory (LBNL). February 2012.
   - Department of Computer Science and Engineering. University of North Texas. March 2012.
5. **Communication-avoiding gang scheduling for multi-core resources in Tessellation OS**. Summer 2011 UC Berkeley Par Lab Retreat. Chaminade Resort & Spa, Santa Cruz, CA. June 2011.
6. **Tessellation OS: Present and future**. Winter 2011 UC Berkeley Par Lab Retreat. Granlibakken Resort. Tahoe City, CA. January 2011.
7. **Tessellation OS: Design principles and resource management**. Workshop on OS and Runtimes for Highly Threaded Systems, UPCRC Symposium. Microsoft Research. Redmond, WA. August 2010.
8. **Resource management in Tessellation many-core OS**. Summer 2010 UC Berkeley Par Lab Retreat. Chaminade Resort & Spa. Santa Cruz, CA. May 2010.
9. **Real-time programming via time-triggered and service functions**. Workshop on OS and Runtimes for Highly Threaded Systems, UPCRC Symposium. Jones Farm Conference Center. Intel Campus. Hillsboro, OR. August 2009.
10. **Time-triggered message-triggered objects and an adaptive distributed sound system**.
    - Parallel Computing Laboratory. University of California, Berkeley. April 2009.
    - School of Electrical Engineering and Computer Science. University of Central Florida. April 2009.
11. **The time-triggered message-triggered object (TMO) programming scheme and a hybrid approach for deriving service-time bounds of methods in real-time distributed computing objects**. Department of Electrical and Computer Engineering. University of Texas, El Paso. March 2009.
12. **Data models and business objects in the oil and gas industry**. PDVSA. Puerto La Cruz, Venezuela. February 2004.
13. **An integrated software architecture for automation applications in the production oil industry**. PDVSA. Maracaibo, Venezuela. December 2003.

Research and Professional Awards

- **2014 Samsung Outstanding Achievement Award**.
- **2013 Samsung Best Paper Award (Gold Medal)**.
  - Our submission was selected as the best paper in the software field among about 350 submissions from all Samsung branches, and it is one of the 9 gold medal winners out of over 1,700 submissions in different technical fields.
- **Runner-up for the Best Paper Award**. The 6th IEEE/ACM Int'l Conference on Utility and Cloud Computing (UCC 2013). Dresden, Germany. December 2013.
- **Best Paper Award**. The 27th Int'l Conference on Computers and Their Applications (CATA 2012). Las Vegas, Nevada, USA. March 2012.
- **Research Promotion Program Award** (PPI #5003). Ministry of Science and Technology (Venezuela).
  - Level-1 Researcher (2008, 2006) and Candidate Researcher (2002)

Academic Honors

- Excellence Award. MARAVEN, S.A. (currently PDVSA). 1997 and 1996.
- Recognition of Extraordinary Academic Performance. 50th Anniversary of the School of Engineering at the University of Zulia. 1996.
- Honors List Diploma. School of Engineering. University of Zulia. 1996, 1995, and 1994.

Fellowships

- Dissertation Fellowship. EECS Department, UC Irvine. March 2008.
- Graduate Studies Fellowship. University of Zulia (Venezuela). 1999-2001.
- Undergraduate Studies Fellowship. MARAVEN, S.A (currently PDVSA). 1992-1997.

Professional Activities and Service

- Served as a Program Committee member of:
  - ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD 2017, 2018)
  - IEEE Int'l Symposium on Real-time Computing (ISORC 2016, 2015, 2014, 2013, 2011, 2010)
  - Workshop on Systems for Future Multi-core Architectures (SFMA 2013, 2011), co-located with the European Conference on Computer Systems (EuroSys)
  - 2nd Int'l Workshop on High Performance Big Graph Data Management, Analysis, and Mining (2015 BigGraphs), co-located with the 2015 IEEE Int'l Conference on Big Data.
- Served as a Program Committee Co-chair of:
  - IEEE Int'l Workshop on Object/component/service-oriented Real-time Networked Ultra-dependable Systems (WORNUS 2011, 2010)
- Reviewed journal submissions for:
  - Communications of the ACM, 2017
  - ACM Transactions on Embedded Computing Systems (TECS), 2009, 2017
  - ACM Transactions on Storage (TOS), 2017
  - IEEE Transactions on Computers, 2012, 2013
  - International Journal on Applied Mathematics and Information Sciences (Natural Sciences Publishing), 2013
  - Journal of Software: Practice and Experience (John Wiley & Sons), 2012
  - "Ciencia." The Scientific Journal of the Experimental Faculty of Sciences, University of Zulia, 2009
  - The Scientific Journal of the School of Engineering, University of Zulia, 2007
- Reviewed conference submissions for:
  - IEEE/ACM 7th Int'l Conference on Utility and Cloud Computing (UCC 2014)
  - 7th Int'l Workshop on Java Technologies for Real-time and Embedded Systems (JTRES 2009)
  - 27th IEEE Int'l Symposium on Reliable Distributed Systems (SRDS 2008)
  - 7th Heinz Nixdorf Symposium (2008)
  - 26th IEEE Int'l Symposium on Reliable Distributed Systems (SRDS 2007)
  - 2007 IFIP Int'l Conference on Embedded and Ubiquitous Computing (EUC 2007)
  - IEEE Int'l Conference on Sensor Networks, Ubiquitous, and Trustworthy Computing (SUTC'06)
- As an assistant editor for the International Embedded Systems Symposium 2007 (IESS'07), was responsible for editing the position statements presented in the panel discussion on "Modeling of Software-Hardware Complexes"
- In 2003, coordinated a national program for encouraging the interaction between Venezuelan public universities and PDVSA in the areas of automation, informatics, and telecommunication.

Professional Memberships

- Association for Computing Machinery (ACM)

- Institute of Electrical and Electronics Engineers (IEEE)
- USENIX Association

Languages Competencies

Spanish: full proficiency

Work Authorization

U.S. Permanent Resident (Green Card holder).