

Juan A. Colmenares, Ph.D.

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Education

- **Post-doctoral Training.** University of California, Berkeley. (September 2009 - present)
Mentor: Prof. John D. Kubiawicz.
- **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) Kim¹
- **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

- Operating systems for many-core architectures
- Distributed systems and middleware
- Multimedia applications
- Large-scale networked cyper-physical systems
- Software engineering
- Empirical studies

Research Experience

Postdoctoral Scholar

2009 - Present

Parallel Computing Laboratory. EECS Department. University of California, Berkeley

- Develops **Tessellation OS**, a new many-core operating system focused on enforcing resource guarantees for client applications. The primary goal is 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 communication-avoiding 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
 - Currently builds Tessellation's adaptive resource-management architecture
- Works 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.
 - Develops **concert-oriented, live-performance music applications** on top of Tessellation OS. These real-time applications involve computationally-intensive audio synthesis, sound reproduction through speaker arrays, and rich responsive gestural input.
 - Built an initial application prototype to demonstrate some of the advantages of Tessellation OS.

Graduate Student Researcher

2004 - 2008

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

¹ Deceased June 2, 2011.

- 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 (Collaborative project between UCI and ETRI, Korea).
- Implemented a **wireless digital music ensemble system**. The system consists of 4 distributed and highly synchronized player nodes that detect the listener's location when s/he claps, and compensate the propagation delays and attenuation of sound in the air to make the music sounds reach the listener in well synchronized and equalized form.
- Devised **lock-free inter-thread communication mechanisms for different 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.
- Refined 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).

Researcher and Faculty Member

1998 - 2004

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

- Designed and implemented a **component-based software architecture for developing industrial automation high-level applications in the oil industry**.
- Developed three variants of a **bayesian global optimization algorithm** and applied one of them 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**.

Ph.D. Dissertation

Derivation of Service-time Bounds of Methods in Time-triggered Message-triggered Objects

Advisor: Prof. Kwang-Hae (Kane) Kim

Summary

An essential requirement in real-time distributed computing (RTDC) is to obtain a high degree of assurance on the timeliness of critical actions taken by the systems. Hence, a desirable RTDC software engineering method must allow us to produce RTDC systems fast enough to meet market demands and to confidently determine service-time bounds of the developed RTDC systems.

The *Time-triggered Message-triggered Object* (TMO) programming scheme is a practical high-level component-based programming model that significantly reduces the amount of labor required in RTDC programming. The TMO, the central element of this scheme, is a syntactically simple and natural but semantically major RTDC extension of the basic object structure. The autonomous-action capability of TMO stems from the time-triggered methods, which are clearly separated from the message-triggered methods whose executions are activated by service request messages

from clients. The TMO Support Middleware (TMOSM) provides the execution support mechanisms for TMOs. The software constructs and execution rules defined by the TMO scheme as well as the structuring principles and execution mechanisms used in TMOSM facilitate the analysis of the major factors that contribute to the service times of TMO-based applications.

This dissertation presents a practical approach for deriving high-confidence tight upper bounds for service times of methods in TMOs. The proposed approach represents a fundamental step towards providing guarantees for timely services in large-scale TMO-based applications. A literature search revealed no previously published results in the area of service-time bound analysis of i) RTDC systems developed using high-level component-based programming models, in general, and ii) TMO-based applications, in particular.

The approach implements a systematic divide-and-conquer procedure that takes advantage of the features of the TMO scheme and TMOSM mentioned above. The procedure involves: i) the derivation of tight time bounds for the contributions of individual factors to the service times of methods in TMOs, and ii) the stepwise integration of those bounds into service-time bounds for the methods.

At each step of the procedure a reasonably safe and tight time bound for the considered factor or group of factors is derived through a hybrid method, which combines execution-time measurements and analytically derived loose bounds. Moreover, the bound integration occurs as the time bounds obtained at one step are used to derive the analytical bounds in the following steps.

The proposed approach was evaluated on a simple multimedia distributed application. Considering the results, the approach holds promise to be equally effective with more complex applications.

Publications

Refereed Journals and Book Chapters

1. **Juggle: Proactive load balancing on multicore computers (extended version)**. Steven Hofmeyr, Juan A. Colmenares, Costin Iancu, and John Kubiawicz. Accepted pending minor revisions in Cluster Computing: the Journal of Networks, Software Tools and Applications (Springer). December 2011.
2. **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.
3. **A software architecture for the development of industrial automation high-level applications in the petroleum industry**. Guido Urdaneta, Juan A. Colmenares, et al. Computer in Industry, 58(1), 2007, pp.35-45.
4. **Efficient global optimization algorithm with coupled additive model**. Juan Colmenares Diaz and Salvador Pintos Mantegani. Ciencia, 13(2), 2005, pp.193-204. [*in Spanish*]
5. **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.
6. **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.
Selected paper from the 3rd Int'l Conference on Enterprise Information Systems (ICEIS 2001), held in Sétubal, Portugal, July 2001.

Refereed Conferences and Workshops

1. **A soft real-time, parallel GUI service in Tessellation many-core OS**. Albert Kim, Juan A. Colmenares, Hilfi Alkaff, and John Kubiawicz. To be presented at the Int'l 27th International Conference on Computers and Their Applications (CATA 2012). Las Vegas, Nevada, USA. March 2012.
2. **Real-time music applications on an experimental operating system for multi-core processors**. Juan A. Colmenares, Ian Saxton, Rimantas Avizienis, Eric Battenberg, Nils Peters, Krste Asanović, John Kubiawicz, and

- David Wessel. In Proc. of the 2011 Int'l Computer Music Conference (ICMC'11). Huddersfield, England. July 2011.
3. **Juggle: Proactive load balancing on multicore computers.** Steven Hofmeyr, [Juan A. Colmenares](#), Costin Iancu, and John Kubiawicz. In Proc. of the 20th Int'l ACM Symposium on High-Performance Parallel and Distributed Computing (HPDC-20). San Jose, CA, USA. June 2011.
 4. **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.
 5. **Resource management in the Tesselation Manycore OS.** [Juan A. Colmenares](#), Sarah Bird, Henry Cook, Paul Pearce, David Zhu, John Shalf, Krste Asanović, and John Kubiawicz. In Proc. of the 2nd USENIX Workshop on Hot Topics in Parallelism (HotPar'10). Berkeley, CA, USA. June 2010..
 6. **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.
 7. **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.
 8. **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.
 9. **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.
 10. **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.
 11. **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.
 12. **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.
 13. **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.
 14. **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.
 15. **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.

16. **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.
17. **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.
18. **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.
19. **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*]
20. **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.
21. **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.
22. **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
23. **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.
24. **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*]

Posters

1. **Implementing the adaptive resource-allocation loop in Tessellation OS.** [Juan Colmenares](#), Steven Hofmeyr, Sarah Bird, Krste Asanović, and John Kubiatoicz. Winter 2012 Par Lab Retreat. Granlibakken Resort. Tahoe City, CA, January 2012.
2. **A real-time, parallel GUI service in Tessellation OS.** Albert Kim, [Juan Colmenares](#), Hilfi Alkaff, and John Kubiatoicz. Winter 2012 Par Lab Retreat. Granlibakken Resort. Tahoe City, CA. January 2012.
3. **Tessellation Operating System: Building a real-time, responsive, high-throughput client OS for many-core architectures.** [Juan A. Colmenares](#), Sarah Bird, Gage Eads, Steven Hofmeyr, Krste Asanović, John Kubiatoicz, et al. Symposium on High Performance Chips (Hot Chips 23). Stanford, CA. August 2011.
4. **Communication-avoiding gang scheduling for multi-core resources in Tessellation OS.** [Juan A. Colmenares](#) and John Kubiatoicz. Summer 2011 Par Lab Retreat. Chaminade Resort & Spa, Santa Cruz, CA. June 2011.
5. **Tessellation OS and a music application.** [Juan A. Colmenares](#), Ian Saxton, Rimas Avizienis, Eric Battenberg, Steven Hofmeyr, Krste Asanović, David Wessel, and John Kubiatoicz. Winter 2011 Par Lab Retreat. Granlibakken Resort. Tahoe City, CA. January 2011.
6. **Resource management in Tessellation many-core OS.** [Juan A. Colmenares](#), Sarah Bird, Henry Cook, Paul Pearce, John Shalf, Steven Hofmeyr, and Krste Asanović, and John Kubiatoicz. Summer 2010 Par Lab Retreat. Chaminade Resort & Spa, Santa Cruz, CA. May 2010.

7. **Tessellation OS: Partition management and two-level Scheduling.** Juan A. Colmenares, Sarah Bird, Paul Pearce, and John D. Kubiataowicz.
 - Winter 2010 Par Lab Retreat. Granlibakken Resort. Tahoe City, CA. January 2010.
 - Berkeley EECS Annual Research Symposium (BEARS 2010). Berkeley, CA. February 2010.

Invited Presentations

1. **Communication-avoiding gang scheduling for multi-core resources in Tessellation OS.** Summer 2011 Par Lab Retreat. Chaminade Resort & Spa, Santa Cruz, CA. June 2011.
 - Attendees: Microsoft, Intel, IBM, National Instruments, Nokia, NVIDIA, Samsung, Oracle, Xilinx.
2. **Tessellation OS: Present and future.** Winter 2011 Par Lab Retreat. Granlibakken Resort. Tahoe City, CA. January 2011.
 - Attendees: Microsoft, Intel, IBM, National Instruments, NEC, Nokia, NVIDIA, Samsung, Oracle, Xilinx.
3. **Tessellation OS: Design principles and resource management.** Workshop on OS and Runtimes for Highly Threaded Systems, UPCRC Symposium. Microsoft Research. Redmond, WA. August 2010.
4. **Resource management in Tessellation many-core OS.** Summer 2010 Par Lab Retreat. Chaminade Resort & Spa. Santa Cruz, CA. May 2010.
 - Attendees: Microsoft, Intel, Cisco, IBM, National Instruments, NEC, Nokia, NVIDIA, Samsung, Oracle, Xilinx.
5. **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.
6. **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.
7. **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.
8. **Data models and business objects in oil and gas industry.** PDVSA-LUZ Meeting. PDVSA campus, Puerto La Cruz, Anzoategui, Venezuela. February 2004.
9. **Integrated software architecture for automation applications in production oil industry.** PDVSA-LUZ Meeting. PDVSA campus, Maracaibo, Zulia, Venezuela. December 2003.

Teaching and Mentoring Experience

Postdoctoral Scholar

2009 - Present

Parallel Computing Laboratory. EECS Department. University of California, Berkeley

- Has co-supervised and worked with **2 Ph.D. students**, **3 undergraduate students**, and **1 visiting researcher**.

Teaching Assistant

2007 - 2008

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

- 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, the final exam, and homework assignments.

- In Winter 2008, prepared and graded the mid-term exam, the final exam, and homework assignments for the **graduate course in Real-time Systems** (EECS 223).
- Coordinated and was an instructor in a **course on TMO programming** taught to graduate students from Sogang University, Korea (in June 2008) and Konkuk University, Korea (in July 2007). The course duration was 20 hours and included lectures and laboratory sessions.

Faculty Member

2002 - 2004

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

- 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 actively participated in the reformulation of the program's curriculum. As result of this effort, the Ministry of Higher Education accredited the program in 2005.
- Participated in **4 Master's thesis committees**.
- Co-formulated, co-managed, and was an instructor in the **extension program "Integration Technological Platforms for Oil and Gas Exploration and Production Industry."** The program consisted of 6 modules and was for professionals working in control, automation, and informatics in the Venezuelan oil and gas industry. In 2003 and 2004, more than 50 professionals from different regions of the country participated in the program.
- Co-formulated and taught the **module "System Integration in 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 novel researchers participating in the *Research Training Program in the Genetics of Common Hereditary Disorders in Venezuela* (Columbia Genome Center - University of Zulia Grant).
- Supervised **1 M.S. student** and **5 undergraduate students**.

Instructor

1998 - 2001

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

- Prepared and facilitated a 3-hour discussion session per week, prepared and graded homework and exams, and held office hours for the **course "Introduction to Neural Networks, Genetic Algorithms, and Fuzzy Logic"** of the M.S. Program in Applied Computing (1 semester).
- 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*.

Professional Experience

Senior Software Engineering

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.

Consultant and Software Developer

1998 - 2004

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

While employed at the Applied Computing Institute, also participated as a consultant, designer or/and developer in a number industry projects, such as:

- *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 smart card-based pre-payment system for students' public transportation.* Client: National Urban Transportation Fund, 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.

Professional Activities and Service

- Served as a Program Committee Co-chair of:
 - IEEE Int'l Workshop on Object/component/service-oriented Real-time Networked Ultra-dependable Systems (2011, 2010)
- Served as a Program Committee member of:
 - IEEE Int'l Symposium on Object/Component/Service-oriented Real-time Distributed Computing (2011, 2010)
 - EuroSys 2011 Workshop on Systems for Future Multi-core Architectures (2011).
- Reviewed journal submissions for:
 - ACM Transactions on Embedded Computing Systems (TECS), 2009
 - "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:
 - The 7th Int'l Workshop on Java Technologies for Real-time and Embedded Systems (JTRES 2009)
 - The 27th IEEE Int'l Symposium on Reliable Distributed Systems (SRDS 2008)
 - The 7th Heinz Nixdorf Symposium (2008)
 - The 26th IEEE Int'l Symposium on Reliable Distributed Systems (SRDS 2007)
 - The 2007 IFIP Int'l Conference on Embedded and Ubiquitous Computing (EUC 2007)
 - The 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, co-coordinated a national program for encouraging the interaction between Venezuelan public universities and PDVSA in the areas of automation, informatics, and telecommunication.

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.

Academic Honors and Awards

- *Research Promotion Program Award* (PPI #5003). Ministry of Science and Technology (Venezuela)
 - Level-1 Researcher (2008, 2006) and Candidate Researcher (2002)
- *Excellence Award*. MARAVEN, S.A. (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).

Professional Memberships

- ACM, IEEE

Languages Competencies

- Spanish: full proficiency

References

John D. Kubiatowicz

Professor
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David Wessel

Professor
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