# Roberto S. Silva Filho, Ph.D.

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## EXPERTISE

Experienced software engineering researcher and practitioner. Full stack development of software tools and collaborative applications connecting people, machines and insights, applying novel Web technologies, IoT, mobile and wearable computing. Research contributions to: automated and collaborative software engineering, software architecture, model-driven systems testing, event-driven middleware, workflow management systems and groupware.

## EDUCATION

2009. **Ph.D.** Information and Computer Sciences. UC, Irvine, CA, USA. GPA: 3.974/4.0
*Concentration areas*: **Empirical Software Engineering, Extensible Event-Based Middleware, CSCW**
*Dissertation Title*: An Empirical Study of Publish/Subscribe Middleware Versatility

2003. **M.Sc.** in Information and Computer Sciences. UC, Irvine, CA, USA. GPA: 3.906/4.0
*Concentration area*: **Software Engineering**

2000. **M.Sc.** in Computer Science. University of Campinas (UNICAMP), Brazil, GPA: 3.857/4.0
*Thesis Title*: Distributed Software Architectures for Large-scale Workflow using CORBA

1998. **B.Sc.** in **Computer Engineering.** University of Campinas (UNICAMP), Brazil**,** GPA: 0.748/1.0

## EMPLOYMENT

2013 – present. **GE Global Research,** San Ramon, CA
**Lead Scientist,** Human Systems Interaction Lab.
*Areas*: Full stack R&D of industrial intelligent software systems. Applying UX, IoT, AI services & Software Engineering techniques to empower industrial workers with insights, automating and optimizing their workflow. Development of web-based, mobile & wearable computing apps, distributed simulation platforms and UX concept prototypes. Production of patents & research publications.

2009 – 2013**. SIEMENS Corporate Technology,** Princeton, NJ
**Software Engineering Researcher**, Software Architecture Development Lab.
*Areas*: Developing and applying advanced software engineering tools & methods in the automation and optimization of industrial problems. Software Architecture Analysis and Improvement, Software Quality Assurance, Model-Driven Development & Testing, Workflow Automation. Production of patents & research publications.

Summer 2004. **IBM T. J. Watson Research Center (Collaborative User Experience Group),** Cambridge, MA
**Research Intern:** Developed, benchmarked and compared different architectural approaches for the construction of contextual collaboration servers used within IBM products.
*Technologies*: Java, RMI, contextual collaboration servers, performance simulation and benchmarking.

2000 – 2009. **University of California,** Irvine, CA
(2002-2009): **Graduate Research Assistant**
(2000-2002): **Teaching Assistant**

## SELECTED PROJECTS

2014 – present. GE Global Research.
**Automation and optimization of industrial work.** Development and user-validation of mobile and wearable apps used to automate field workers activities. Connecting people to insights as they perform their work. Automation of data capture, analysis and reporting during maintenance and inspection of industrial assets. Interfacing with industrial machines and robots using IoT protocols including Bluetooth, MQTT, and ROS. Integration with corporate information systems via JDBC and REST.
Example:
**Knowledge Discovery.** Develop IDE & middleware for multi-source data exploration & analysis.
**Distributed Simulation Platform**. Developed platform to speed up the development of new UX concepts in transportation domain.

**Natural language processing (NLP)**. Apply NLP to optimize control of industrial assets, and the user capture & access of information.
*Technology stack*: **UI**: JavaScript/Android/Natural language Processing; **Server**: Docker, Java, REST, OSGi, JDBC, SemTK, ROS.

2009 – 2013. SIEMENS Corporate Research.
**Software Tools for test automation and software quality analysis**: Extended Tedeso/UML, a model-based testing IDE with novel features and capabilities including requirements-driven regression and prioritization of tests. Tedeso can achieve high degrees of test coverage, by automatically generating tests based on UML system specification, at a fraction of time of conventional manual testing approaches.
*Main Role*: Product developer & manager of a small team of interns working on Tedeso/UML IDE.
*Technology stack:* Java, Eclipse RCP, GEF, UML, model-based testing, Jenkins, Cruise Control.

2007 – 2009. UC, Irvine (UCI). **Analysis of Flexibility Trade-offs in Publish/Subscribe Infrastructures**: Developed a versatile pub/sub middleware evaluating it against different research and industrial publish/subscribe infrastructures, measuring and comparing their performance, maintainability, reusability, usability and flexibility. Produced different versatile software design principles and best practices.
*Technologies*: Java and RMI, CORBA-NS, JMS, JavaSpaces, Siena, YANCEES, OO metrics and analysis.

2004 – 2007. UC, Irvine (UCI). **Effective Security Through Visualizations:** Developed software infrastructures, user interfaces and conducted user studies with Impromptu, an event-driven peer-to-peer file sharing workspace, which provides security awareness through visualizations. I also developed a thin client version of Impromptu for PocketPC. This project investigated the benefits of different security visualizations, running in different devices, in supporting ad-hoc collaboration.
*Main Role:* chief architect, coordinating the work of four students/developers.
*Technologies*: WebDAV Servlets, multicast DNS (Zeroconf), notification servers, Java ME for PocketPC.

1998 – 2000. University of Campinas, São Paulo, Brazil (UNICAMP): **Agent-based Workflow on Distributed Environment**: Developed and evaluated the scalability of a distributed architecture for large-scale workflow as part of my Master's Thesis. This work shows the scalability benefits of a peer-to-peer agent-based workflow management system and discusses extra security and management costs induced by the approach.
*Technology stack*: Java, JavaCC, CORBA, Workflow Management Systems, Mobile Agents, benchmarking.

## TEACHING EXPERIENCE

Fall 2001 – Spring 2002. Introduction to Computer Science II. UC, Irvine (UCI)
*Topics*: Data Structures, Software Complexity, Java and Scheme programming.
Fall. 2000. Introduction to Software Engineering. UC, Irvine (UCI)
*Topics*: Software Engineering fundamental principles, techniques and processes.

## HONORS AND AWARDS

2007. Bren School Summer Dissertation Fellowship, UC, Irvine, CA.
2001. **Best thesis award** (second place): VIII CLEI-UNESCO Latin American M.Sc. Thesis Context.
1998 – 2000. Scholarships to support M.Sc. Studies from FAPESP and CNPq, Brazil Research Agencies.

## SKILLS

**Programming Languages**: Java, JavaScript, C#, Python, GoLang, LISP, Pascal, SQL, Prolog, C, C++, others.
**Technologies**: UI frameworks: AngularJS, Polymer, React; Mobile computing: Android, Cordova; Distributed Systems: REST Web Services, Docker, Event-based middleware, Distributed Network Objects (RMI, CORBA); Software Engineering: Software Product Line Engineering, UML Modeling, Software Architecture and ADLs, Aspect-Oriented Programming, Database and Internet Programming. Others: XML, Eclipse RCP and OSGi.
**Processes**: Agile Methods and Object-Oriented design principles and metrics, Rational Unified Process.
**Operating Systems**: Unix/Linux and Windows administration.

## PATENTS & PUBLICATIONS

Author of more than 35 peer-reviewed publications; 6 patents and 12 technical reports.
Details Available at the website: http://www.ics.uci.edu/~rsilvafi