Roberto S. Silva Filho, Ph.D.

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EXPERTISE

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

EDUCATION

2003 – 2009. University of California, Irvine (UCI), CA, USA
Ph.D. Information and Computer Sciences, 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

2000 – 2003. University of California, Irvine (UCI), CA, USA
M.Sc. in Information and Computer Sciences, GPA: 3.906/4.0
Concentration area: **Software Engineering**

1998 – 2000. University of Campinas (UNICAMP), Brazil
M.Sc. in Computer Science, GPA: 3.857/4.0
Thesis Title: Distributed Software Architectures for Large-scale Workflow using CORBA

1993 – 1998. University of Campinas (UNICAMP), Brazil
B.S. in **Computer Engineering,** GPA: 0.748/1.0

EMPLOYMENT

2013 – present. **GE Global Research,** San Ramon, CA
Lead Scientist, Intelligent Industrial Experiences Lab.
Areas: Full stack R&D of industrial intelligent software systems. Applying UX, IoT, AI & Software Engineering techniques to empower industrial workers with insights, simplifying and optimizing their work across different GE businesses. Development of web-based, mobile & wearable computing apps, distributed simulation platforms and UX concepts. 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.
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 practices. Development and user-validation of mobile and wearable apps used to automate field workers tasks. Connecting people to insights as they perform their work. Automation of data capture 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.

Knowledge Discovery. User-driven IDE & middleware for multi-source data exploration & analysis.
Distributed Simulation Platform. Used to implement UX concepts in transportation domain.
Natural language interfaces. Development of speech-driven apps.
Technologies: **UI**: JavaScript/Android/Natural language; **Server**: 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 system specification, at a fraction of time of conventional manual testing approaches.
Role: Product developer and manager of a small team of interns working on Tedeso/UML IDE.
Technologies Java, Eclipse RCP, GEF, model-based testing, Subversion, Ant, Cobertura, Cruise Control.

2007 – 2009. UC, Irvine (UCI). **Analysis of Flexibility Trade-offs in Publish/Subscribe Infrastructures**: Developed benchmarks and conducted empirical quantitative and qualitative evaluation of 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.
Technologies: 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, React, Polymer; Distributed Systems: REST Web Services, Event-based middleware, Distributed Network Objects (RMI, CORBA); Mobile computing: Android, Cordova; 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: Rational Unified Process, Agile Methods and Object-Oriented design principles and metrics.
Operating Systems: Unix and Win32 administration.

PATENTS & PUBLICATIONS

Available at the website: http://www.ics.uci.edu/~rsilvafi