Roberto S. Silva Filho

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EXPERTISE

Experienced researcher and practitioner in the areas of Software Engineering & Groupware. Development of industrial Web, mobile and wearable apps. Research contributions to: automated and collaborative software engineering, software architecture, model-driven systems development & testing, event-driven middleware, workflow management systems and groupware. Production of patents & research papers.

WORK EXPERIENCE

2013 – present. **GE Global Research,** San Ramon, CA
    Lead Scientist, Human Systems Interaction Lab.
    Full stack R&D of industrial applications applying UX, IoT, AI services & Software Engineering techniques to automate and optimize industrial workflows.
    Keywords: Web, mobile & wearable industrial apps, distributed simulation platforms and UX.

2009 – 2013**. SIEMENS Corporate Technology,** Princeton, NJ
    Software Engineer/Researcher, Software Architecture Development Lab.
    Full stack R&D of advanced software engineering tools & methods for the automation and optimization of industrial systems across SIEMENS businesses.
    Keywords: Software Architecture Analysis and Improvement, Software Quality Assurance, Model-Driven Development & Testing, Workflow Automation.

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

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

EDUCATION

2009. **Ph.D. Information and Computer Sciences**. UC, Irvine, CA, USA. GPA: 3.974/4.0
    Concentration areas: **Empirical Software Engineering, Event-Based Middleware, CSCW**
    Dissertation Title: An Empirical Study of Publish/Subscribe Middleware Versatility
2003. **M.Sc. Information and Computer Sciences.** UC, Irvine, CA, USA. GPA: 3.906/4.0
    Concentration area: **Software Engineering**
2000. **M.Sc. 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. Computer Engineering.** University of Campinas (UNICAMP), Brazil**,** GPA: 0.748/1.0

SELECTED PROJECTS

2014 – present. GE Global Research.
- **Digital Ghost.** Developed the Web app used to visualize cyber-attacks on industrial assets. Built the infrastructure to log and analyze high-frequency time series data produced by the Digital Ghost agents, allowing users to rapidly detect and respond do cyber threats to critical industrial infrastructure.[GE'20]
- **Distributed Platform for Rapid Simulation Prototyping**. Developed a event-driven services coordination framework to facilitate the development of next generation train handling and controls. Used the framework to develop human-in-the-loop remote train handling simulator [WSC'17].
- **Machining Cost Optimization**. Developed Web app to optimize CNC drilling & milling tools, allowing aviation workshop workers to and share their expertise throughout the organization & reduce workshop operational costs.

- **Fieldwork Automation**: Developed mobile apps used by GE Power field engineers as a single point of access to all their information needs including: project management, time keeping, schematics & documents, reporting, and collaboration. Implemented server-side API gateway and offline disconnected operation. [MS'15] [HCII'15]
- **Model-based robotic inspection**. Implemented middleware connecting UI and drone controls, allowing supervised semi-autonomous robotic inspections of industrial assets.
- **Wearables@GE**. Applied speech-driven wearable computing in support of hands-free workflow applications including: wireless measurements, photo documentation, real-time video communication.

2009 – 2013. SIEMENS Corporate Research.

IDE for model-based test automation: Project manager & developer for TEDESO/UML, a model-based testing IDE. Lead, for 4 years, a small team of interns in the development of extensions and core capabilities including requirements-driven regression and prioritization of tests and workflow-driven UI. 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 [ASE'13].
Technologies: 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 YANCEES, a versatile pub/sub middleware evaluating it against different research and industrial message-oriented middleware, measuring and comparing their performance, maintainability, reusability, usability and flexibility. Produced different versatile software design principles and best practices. [ISR09]
Technologies: Java, CORBA-NS, JMS, JavaSpaces, Siena, YANCEES, OO metrics and analysis.

1998 – 2000. University of Campinas, São Paulo, Brazil (UNICAMP): **Agent-based Workflow on Distributed Environment**: Developed and evaluated a scalable peer-to-peer workflow automation framework with more traditional centralized approaches. Discussed the scalability, performance, security and management trade-offs of each approach. [ISADS'99]
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, SQL, C#, Python, Go, LISP, Pascal, Prolog, C, C++, others.
Technologies: UI frameworks: Polymer, Vue.js, React, AngularJS; 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, 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 US patents and 12 technical reports.
More details at the website: https://rsilvafi.github.io/publications.html