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EXPERTISE

Industrial work automation and optimization through the combination of Web technologies, IoT, mobile and wearable computing. Automated software engineering: software architecture, model-driven development and testing, event-driven middleware, collaborative software development, 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
Position: Lead Scientist, Intelligent Industrial Experiences Lab.
Areas: Full stack R&D of industrial intelligent software systems. Applying UX, IoT, AI & Software Engineering techniques in the digitization and optimization of industrial work practices and problems within GE businesses. Development of mobile apps, wearable computing prototypes, simulation platforms and UX concepts; Web apps for collaboration, optimization and knowledge discovery. Production of patents & research publications.

2009 – 2013**. SIEMENS Corporate Technology,** Princeton, NJ
Position: Software Engineering Researcher, Software Architecture Development Lab.
Areas: 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. The goal of the research was to investigate the performance trade-offs of integrating synchronous and asynchronous collaboration modes in a single contextual collaboration model.
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**

1996 – 1997. **PETROBRAS** (Brazilian Oil Prospecting Company), Campinas, Brazil
Software Engineer Co-op: Develop a decision-making database for sales office in Campinas.

SELECTED PROJECTS

2014 – GE Global Research.
Fieldwork automation and optimization. Developed mobile and wearable apps for contextual information access and optimized data capturing during maintenance and inspection of industrial assets. Interfacing with industrial machines and robots using Bluetooth, MQTT protocols, and ROS. Integration

with corporate information systems via JDBC and REST APIs.
Knowledge Discovery. Semantic-Web middleware and UI for data integration and analysis.
Distributed Simulation. Software Infrastructure for Reduced Crew train operations. Developed a testbed and human-in-the-loop simulator for remote train operations. Natural language interfaces.
Technologies: **UI**: JavaScript/Android/Natural language; **Server**: Java, REST, OSGi, JDBC, SemTK, ROS.

2009 – 2013. SIEMENS Corporate Research.
Concern-Based Regression Testing and Prioritization in a Model-Driven Environment.: 10x improvement of test quality and coverage through automation. Extended Tedeso/UML, a model-based testing IDE with novel features and capabilities including requirements-driven regression and prioritization of tests.
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). **SWIRL – 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): **WONDER – 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.

PUBLICATIONS

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