Roberto Silveira Silva Filho

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EDDUCATION

University of California, Irvine (UCI), CA, USA
- Ph.D., Information and Computer Sciences, Summer 2009
  Dissertation: Analysis of Versatility Trade-offs of Publish/Subscribe Infrastructures
  Advisor: David F. Redmiles. *GPA*: 3.975/4.0.

- M.Sc., Information and Computer Sciences, 2003
  Concentration Area: Software Engineering. GPA: 3.906/4.0.

University of Campinas (UNICAMP), Campinas, Brazil
- M.Sc., Computer Science, 2000
  Thesis: Distributed Software Architectures for Large-scale Workflow using CORBA.
  Advisor: Jacques Wainer. GPA: 3.850/4.0.

- B.Sc., Computer Engineering, 1997. GPA: 0.748/1.0.

HONNORS AND AWARDS

Bren School Summer Dissertation Fellowship, Summer 2007.
Best Master's Thesis Award (second place): VIII CLEI-UNESCO Latin American Master's Thesis
    Context, Sep. 2001.
Scholarship to support M.Sc. Studies from FAPESP (Sao Paulo State Research Foundation), Brazil,
    Jun. 1998 - Apr. 2000.
Scholarship to support M.Sc. Studies from CNPq (Brazilian Research Council), Brazil,
    Mar. 1998 - Jun. 1998.

PROFESSIONAL EXPERIENCE

Post-Doctoral Fellow, Fall 2009 – Present
SIEMENS Corporate Research, Princeton, NJ
    Managers: Marlon Vieira and Daniel Paulish.
    Software Quality Assurance, Model-Driven Development and Testing

Graduate Research Assistant, 2002 – 2009
University of California, Irvine, CA

Research Intern, Summer, 2004
IBM T. J. Watson Research Center, Cambridge, MA
    Mentor: Werner Geyer, Manager: David Millen.
    Conducted an empirical study (benchmark) where the scalability, performance and integration
    trade-offs of a contextual collaboration server were analyzed.

Server Administration, 2002-present
University of California, Irvine
    Conducted maintenance and administration of a UNIX/Linux research group server (Apache,
    Samba, Wiki, Plone, CVS, MySQL, Subversion and other services).

Research Intern, Aug-Dec 1997
Renato Archer Information Technology Research Center (CTI), Campinas, Brazil
    Developed a distributed architecture for a VRML-based airship simulator, using Java and
    CORBA.

Software Engineer, Apr 1996 - Apr 1997
CONPEC Jr. Company, Campinas, Brazil
> Analyzed and developed a decision support system for the regional management office of Brazilian Oil Company (PETROBAS) using MS-FoxPro and SQL.

IT Analyst/Support, 1992-2000
IMPETROL Chemicals, Salvador, Brazil
> Conducted IT support (hardware and software installation and management) on a medium-sized corporative network (approximately 10 workstations and 2 servers) running Windows and Linux.

RESEARCH
EXPERIENCE

POST-DOC

Model-Driven Regression Testing and Prioritization
> Working with the SIEMENS Systems Development Technologies group on extending a UML-Based testing environment to support regression testing and prioritization of test cases based on a flexible set of user criteria including: change impact, features, risk, and other concerns. The tool is being applied in industrial-strength projects throughout SIEMENS Corporation.

PH. D. DISSERTATION

Analysis of Versatility Trade-offs of Publish/Subscribe Infrastructures
> I've designed benchmarks, developed different case studies, defined software metrics and analyzed how versatility design decisions such as: generality, configurability and extensibility inter-relate, and how they affect the middleware reusability, API usability, maintainability and performance from the points of view of infrastructure developers and consumers. The results will be published in forthcoming software engineering conferences.

YANCEES: Adding Versatility to Publish/Subscribe Infrastructures
> Developed YANCEES, a versatile (highly configurable and extensible) publish/subscribe infrastructure. YANCEES has been used in support of different projects, including: usable security (Impromptu/Swirl), software usability monitoring, contextual collaboration, and others [DEBS'03, SEM'05, JUCS'08].

M.Sc. THESIS

WONDER: Distributed Architecture for Large-Scale Workflow
> Developed and evaluated a highly scalable distributed workflow management system, based on autonomous mobile software agents. This work demonstrated the scalability benefits, and the security and fault-tolerance overheads of a highly decentralized agent-based peer-to-peer architecture in the support for large-scale workflow [ISADS'99, IJCIS'03].

PREVIOUS PROJECTS

Bridging the aspect-oriented programming usability gap
> I've designed and conducted user studies to evaluate the benefits of in-line edit-time code weaving as a way to reduce context-switching and errors related to the evolution of base and aspect-code in aspect-oriented software [ASE'08].

Continuous Coordination: Combining Formal and Informal Coordination Approaches in Collaborative Distributed Software Engineering Environments
> Continuous Coordination unifies and integrates the formerly opposed strategies of formal and informal coordination into a single concept by leveraging on awareness and synchronous collaboration tools. In this project, I have worked in the development of event-driven

infrastructures in support of this integration [Wirtschaftsinformatik'07].

Effective Security Through Visualizations

Validated the hypothesis that by providing users with a technical infrastructure which makes visible the configuration, activity, and implications of available security mechanisms, users can make informed choices about their behavior; yielding more effective, more secure system use [IJHCS'05, SOUPS'05, SOUPS'06].

Analysis of Performance and Scalability Trade-offs of Blending Synchronous and Asynchronous Contextual Collaboration Services

Contextual collaboration seamlessly integrates existing Groupware technologies into a uniform user experience that combines synchronous and asynchronous multi-media interactions. In this project, I have developed a benchmarked and analyzed the performance and scalability trade-offs of a family of infrastructures developed according to different architectural strategies [JUCS'08].

xADL Extensible Software Architecture Description Language

Developed configuration management and runtime change extensions for xADL, an extensible architecture description language (ADL) based on XML, as a way to support architecture-based software evolution. (Collaborators: Eric Dashofy and André van der Hoek).

Aurora (Autonomous Unmanned Remote Monitoring Robotic Airship) Project

Developed a distributed architecture for a VRML-based airship simulator, using Java and CORBA. The goal of this project was to study and evaluate architectural approaches to support the distributed visualization of the airship simulator. (Collaborators: Josué Ramos and Samuel Bueno).

Distributed Object Domain Management API

Developed a Distributed Domain Facility management framework based on CORBA as part of my undergraduate conclusion thesis. The goal of this project was to support developers and system administrators in visualizing and monitoring the behavior of distributed component-based applications [SBRC'98].

TEACHING EXPERIENCE

Guest Lecturer, Spring 2009
Software Architecture and Distributed Systems (undergraduate-level). UC, Irvine (UCI)
Taught a class on Publish/Subscribe Middleware Versatility

Guest Lecturer, Winter 2006
Software Engineering (graduate-level). UC, Irvine (UCI)
Taught a class on Event-Based Architectures and Applications.

Teaching Assistant, Fall 2001- Spring 2002
Introduction to Computer Science II. UC, Irvine (UCI)
For 3 quarters, prepared and thought discussion sections, tutored students during lab hours, graded programs and assignments for a group of 40 students.
<u>Topics</u>: Data Structures, Software Complexity, Java and Scheme programming.

Teaching Assistant, Fall 2000
Introduction to Software Engineering. UC, Irvine (UCI)
Lectured, graded assignments and programs; lead discussion sessions (class teaching) and tutored a group of 120 students.
<u>Topics</u>: Software Engineering fundamentals and processes.

PUBLICATIONS

JOURNAL PUBLICATIONS (REFEREED)

J.1. Geyer, W., Silva Filho, R. S., Brownholtz B., Redmiles, D. F. **The Trade-Offs of Blending Synchronous and Asynchronous Communication Services to Support Contextual Collaboration**. Journal of Universal Computer Science (JUCS) - *Special Issue on Groupware: Issues and Applications with a selection of papers presented at 12th International Workshop on Groupware.* Vol 14, No. 1, pp. 4-26, March 2008.

J.2. Redmiles, D. F., Van der Hoek, A., Al-Ani, B., Hildenbrand, T., Quirk, S., Sarma, A., Silva Filho, R. S., De Souza, C. R. B., Trainer, E.. **Continuous Coordination: A New Paradigm to Support Globally Distributed Software Development Projects**. In: Wirtschaftsinformatik -*Special Issue on the Industrialization of Software Development*, Vol. 49, Issue 3, pp. S28-S38, Vieweg Publishers, 2007.

J.3. DePaula, R., Ding, X., Dourish, P., Nies, K., Pillet, B., Redmiles, D. F., Ren, J., Rode, J., and Silva Filho, R. S.. **In the Eye of the Beholder: A Visualization-based Approach to Information System Security**. International Journal of Human-Computer Studies (IJHCS) - *Special Issue on HCI Research in Privacy and Security*, Vol. 63, Issue 1-2, pp. 5-24. July 2005.

J.4. Silva Filho, R. S., Wainer, J., Madeira, E. R. M. **A Fully Distributed Architecture for Large-scale Workflow Enactment.** International Journal of Cooperative Information Systems (IJCIS). Vol. 12, No. 4 (2003), pp. 411-440. December 2003.

J.5. Silva Filho, R. S., Wainer, J., Madeira, E. R. M., Ellis, C. **CORBA Based Architecture for Large Scale Workflow.** IEEE/IEICE Transactions on Communications - *Special Issue on Autonomous Decentralized Systems.* Tokyo, Japan, Vol. E83-B, No. 5, pp.988-998., May 2000.

BOOK CHAPTERS (REFEREED)

B.1. Sarma, A., Al-Ani, B., Trainer, E., Silva Filho, R. S., da Silva, I. A., Redmiles, D. F., van der Hoek, A.. **Continuous Coordination Tools and their Evaluation**. Collaborative Software Engineering. Springer, 2009 (in press).

MAGAZINE ARTICLES (REFEREED)

M.1 Naslavsky, L., Silva Filho, R. S., **Fazendo Doutorado nos Estados Unidos**. SBC Horizontes. (Brazilian Computer Society Magazine on Computer Science Career). Vol. 1, No. 1, pp. 46-49. December 2008.

CONFERENCE PUBLICATIONS (REFEREED)

C.1. Ruegmee, W., Silva Filho, R. S., Bajracharya, S. K., Lopes, C. V. and Redmiles, D. F.. **XE (eXtreme Editor) – Bridging the Aspect-Oriented Programming Usability Gap.** Proceedings of the 23rd IEEE/ACM International Conference on Automated Software Engineering (ASE'08). pp. 435-438. L'Aquila, Italy, September 15-19, 2008.

C.2. Silva Filho, R. S. and Redmiles, D. F. **Managing Feature Interaction by Documenting and Enforcing Dependencies in Software Product Lines.** Proceedings of the 9th International Conference on Feature Interactions in Software and Communication Systems (ICFI'07). pp.33-48, Grenoble, France, September 3-5, 2007.

C.3. Silva Filho, R. S., Redmiles, D. F. **Towards the use of Dependencies to Manage Variability in Software Product Lines.** Presented at the Workshop on Managing Variability for Software Product Lines: Working with Variability Mechanisms, co-located with the 10th International Software Product Line Conference (SPLC'06). pp. 10-15, Baltimore, MD, August, 21-24th, 2006.

C.4. Silva Filho R. S., Geyer, W., Brownholtz, B., Redmiles, D. F. **Understanding the Trade-offs of Blending Collaboration Services in Support of Contextual Collaboration**. Proceedings of the 12th International Workshop on Groupware (CRIWG'06). Published in Lecture Notes in Computer Science, Vol. 4154, pp. 270-285, 2006.

C.5. Silva Filho, R. S., Redmiles, D. F. **Extending Desktop Applications with Pocket-size Devices**. Presented in the Symposium on Usable Privacy and Security (SOUPS'06). Pittsburgh, PA, July 12-14, 2006.

C.6. Rode, J., Johansson, C., DiGioia, P, Silva Filho, R. S., Nies, K., Nguyen, D. H., Ren, J., Dourish, P., Redmiles, D. F. **Seeing Further: Extending Visualization as a Basis for Usable Security**. Proceedings of the Symposium on Usable Privacy and Security (SOUPS'06). pp. 145-155. Pittsburgh, PA. July 12-14, 2006

C.7. Silva Filho, R. S., Redmiles, D. F. **Striving for Versatility in Publish/Subscribe Infrastructures**. Proceedings of the 5th International Workshop on Software Engineering and Middleware (SEM'05), co-located with the ACM ESEC/FSE Conference. pp. 17-24. Lisbon, Portugal. September, 5th-6th, 2005.

C.8. DePaula, R., Ding, X., Dourish, P., Nies, K., Pillet, B., Redmiles, D. F., Ren, J., Rode, J., and Silva Filho, R. S.. **Two Experiences Designing for Effective Security**. Proceedings of the Symposium On Usable Privacy and Security (SOUPS'05). pp. 25-34. Pittsburgh, PA. July 6-8, 2005.

C.9. Van der Hoek, A., Redmiles, D. F., Dourish, P., Sarma, A., Silva Filho, R. S., De Souza, C. R. B. **Continuous Coordination: A New paradigm for Collaborative Software Engineering Tools**. Proceedings of the Workshop on Directions in Software Engineering Environments (WoDiSEE'04), co-located with the 26th ICSE. pp. 29-36. Edinburgh, UK, May 25th, 2004.

C.10. Naslavsky, L., Silva Filho, R. S., De Souza, C. R. B., Dias, M., Richardson, D., Redmiles, D. F. **Distributed Expectation-Driven Residual Testing.** Presented in the Second International Workshop on Remote Analysis and Measurement of Software Systems (RAMSS'04), co-located with the 26th ICSE. Edinburgh, UK, May 24th, 2004.

C.11. Silva Filho, R. S., De Souza, C. R. B., Redmiles, D. F. **The Design of a Configurable, Extensible and Dynamic Notification Service**. Proceedings of the Second International Workshop on Distributed Event-Based Systems (DEBS'03), co-located with The ACM SIGMOD/PODS Conference, San Diego, CA, pp.1-8, June 8th, 2003.

C.12. Silva Filho, R. S., Slabyak, M., Redmiles, D. F. **Web-based Infrastructure for Awareness Based on Events**. Presented in the Workshop on Network Services for Groupware, co-located with the ACM Conference on Computer Supported Cooperative Work (CSCW'02). New Orleans, LA, November 16-20, 2002.

C.13. Silva Filho, R. S., Wainer, J., Madeira, E. R. M. **A Distributed Architecture for Large-scale Workflow**. Proceedings of the XXVII Latino American Informatics Conference. September 24-26th, 2001. Mérida, Venezuela. **Best master's thesis award: second place in the VIII Master's Thesis Contest CLEI - UNESCO 2001.**

C.14. Silva Filho, R. S., Wainer, J., Madeira, E. R. M., Ellis, C. **CORBA Based Architecture for Large Scale Workflow**. Proceedings of the 4th International Symposium on Autonomous Decentralized Systems (ISADS'99). Tokyo, JAPAN. pp. 276-283. March 20-23, 1999. ISBN 0-7695-0137-0. IEEE Computer Society Eds.

C.15. Silva Filho, R. S., Wainer, J., Madeira, E. R. M., Ellis, C. **Wonder: A Distributed Architecture for Large Scale Workflow Using CORBA**. Presented in the 17th Brazilian Symposium on Computer Networks - (SBRC'99) - Salvador, BA, Brazil. May 25-28, 1999. pp. 379-380.

C.16. Queiroz, J. A. G., Silva Filho, R. S. and Madeira, E. R. M. **Facilidade de Domínios em um Ambiente de Gerência CORBA.** Proceedings of the 16th Brazilian Symposium on Computer Networks (SBRC'98). Rio de Janeiro, RJ, Brazil - May, 1998, pp. 765.

TECHNICAL REPORTS

TR.1. Silva Filho, R. S., and Redmiles, D. F.. An **Analysis of Publish/Subscribe Middleware Versatility.** Technical Report UCI-ISR-09-3. University of California, Irvine, CA, August 2009.

TR.2. Reugme, W., Silva Filho, R. S., Bajracharya, S. K., Lopes, C. V., Redmiles, D. F. **XE (Extreme Editor) - Tool Support for Evolution in Aspect-Oriented Programming.** Technical Report UCI-ISR-08-1. University of California, Irvine. Irvine, CA, June 2008.

TR.3. Silva Filho, R. S., Geyer, W., Brownholtz, B., Guy, I., Redmiles, D. F., Millen, D. R.. **Architectural Trade-Offs for Collaboration Services Supporting Contextual Collaboration**. IBM T. J. Watson Technical Report RC23756. Cambridge, MA, October 2005.

TR.4. Silva Filho, R. S., Redmiles, D. F. **A Survey on Versatility for Publish/Subscribe Infrastructures**. Technical Report UCI-ISR-05-8. UC, Irvine, May 2005.

TR.5. Silva Filho, R. S., Redmiles, D. F. **Preserving Versatility in Event-based Middleware**. Technical Report UCI-ISR-04-7. UC, Irvine, October 2004.

TR.6. Silva Filho, R. S., De Souza, C. R. B., Redmiles, D. F. **Design and Experiments with YANCEES, a Versatile Publish-Subscribe Service**. TR-UCI-ISR-04-1. UC, Irvine, April 2004.

TR.7. Silva Filho, R. S., Queiroz, J. A. G., Madeira, E. R. M.. **Distributed Object Domains for a CORBA Based platform**. Technical Report. Institute of Computing, Campinas, São Paulo, Brazil 1997.

THESIS AND DISSERTATIONS

D.1. **Ph.D. Dissertation**: Analysis of Versatility Trade-offs in Publish/Subscribe Middleware. – expected defense date: Summer 2009.

D.2. **Master's Thesis**: A CORBA Based Architecture for Large Scale Workflow. Portuguese tittle: "*Uma Arquitetura Baseada em CORBA para Workflow de Larga Escala*" - June 2000.

STUDENT SUPERVISION

As part of my Ph.D. duties, I assisted on the supervision of the following students:

S.1 Wiwat Ruengmee (PhD. Student UC, Irvine. Current).

S.2 David Bentolia (M.Sc. Student, Federal University of Pará, Brazil. Current).

GRANT PROPOSAL PREPARATION

I contributed significantly in the writing and preparation of the following grant proposals:

G.1 Towards a Socio-technical Dependency Visualization Infrastructure for Jazz. IBM Eclipse Innovation Award. October 2008, with a budget of US$20,000

G.2 Unifying Formal and Informal Collaboration through Continuous Coordination. NSF Award number 0534775. 2005-2008, with a budget of US$681,402.

G.3 Study of Scalability Trade-offs of Large-Scale Workflow. FAPESP (São Paulo State Research Foundation, Brazil) award # 98/06648-0, Jun.1998 - Apr. 2000 with a budget of: R$22,000 approximately US$10,000.

PRESENTATIONS & DEMOS	P.1 **June 2009,** Siemens Corporate Research, Princeton, NJ
	P.2 **September 2007,** International Conference on Feature Interaction, Grenoble, France.
	P.3 **August 2006,** Workshop on Managing Variability in Software Product Lines, 10th International Software Product Line Conference, Baltimore, MD.
	P.4 **July 2006,** Symposium on Usable Privacy and Security (SOUPS'06), Pittsburgh, PA.
	P.5 **September 2005,** Fifth International Workshop on Software Engineering and Middleware (SEM'2005). ACM ESEC/FSE Conference, Lisbon, Portugal.
	P.6 **September 2004,** *The Trade-offs of Blending Synchronous and Asynchronous Services in a Collaboration Infrastructure*. IBM T.J. Watson, Cambridge, MA.
	P.7 **June 2003,** Second International Workshop on Distributed Event-Based Systems (DEBS'03), ACM SIGMOD/PODS Conference, San Diego, CA.
	P.8 **November 2002,** Workshop on Network Services for Groupware. CSCW2002. New Orleans, LA.
	P.9 **July 1-4, 2002,** Awareness Gauges, *Formal Tool Demonstration, DARPA - DASADA Demo Days,* Baltimore, MD.
	P.10 **September 2001,** XXVII Latino American Informatics Conference. Mérida, Venezuela.
	P.11 **June 2000,** University of Campinas, Campinas, SP, Brazil.
	P.12 **May 1999,** 17th Brazilian Symposium on Computer Networks - (SBRC'99)
	P.13 **December 1997,** Renato Archer Information Technology Research Center (CTI), Campinas, SP, Brazil.

SOFTWARE

SW.1. **Impromptu**: A collaborative P2P file sharing tool and
Tiny-Impromptu: JavaME thin clients for PocketPC, 2005.

SW.2. **IC contextual collab. server prototype and client simulator**, IBM Cambridge, 2004.

SW.3. **YANCEES** : A versatile publish/subscribe infrastructure, 2003.

SW.4. **WONDER**: A distributed workflow management system based on software agents, 2000.

SERVICE TO THE RESEARCH COMMUNITY

PROGRAM COMMITTEE MEMBER
- PESOS'2010. Intl. Workshop on Principles of Engineering Service-Oriented Systems (2010)
- SBSC'2006**.** Brazilian Symposium on Collaborative Systems (2006).

REVIEWER
- Primary: Journal of Management & Engineering Integration (2009)
- Secondary: ACM Transactions on Software Engineering and Methodology (2009)
- Primary: Elsevier Journal of Systems and Software (2006).

STUDENT VOLUNTEER
- 20th IEEE/ACM Conference on Automated Software Engineering (ASE'2005), Nov. 7-11, 2005.
- Artwork designer for both the proceedings cover and the conference program booklet for the ASE'2005 conference, Fall 2005.
- OOPSLA 2003 conference, Anaheim, CA, October 36-30, 2003.

PROFESSIONAL AFFILIATIONS

Member of the ACM (Association of Computer Machinery)

LANGUAGES

Fluent read, write and speak: English and Portuguese (native).
Functional Spanish speaker.

COMPUTER

SKILLS

PROGRAMMING LANGUAGES
Java, LISP, Pascal, x86 Assembly, Xbase, SQL, Basic, Prolog, C, C++, others.

TECHNOLOGIES
Event-based Middleware (notification servers), Distributed Objects (RMI, CORBA), Software Product Line Engineering, Object-Oriented UML Modeling, Software Architecture and ADLs (xArch), Design Patterns, Databases, Internet Programming, XML and XMLSchema, Eclipse plug-in development with SWT and GEF.

OPERATING SYSTEMS
Linux and Win32 administration.

TOOLS
Eclipse, CVS, Subversion, Ant, Maven, others.

REFERENCES

David F. Redmiles (Ph.D. Dissertation Advisor)
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Bren School of Information and Computer Sciences
Department of Informatics
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Irvine, CA, USA 92697-3440
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Jacques Wainer (M.Sc. Thesis Advisor)
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Universidade Estadual de Campinas
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Campinas, SP Brazil 13083-970
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Cleidson de Souza
Associate Professor, Department of Informatics
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