

Personal Data

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Academic Background

2010 - PhD in Computer Science
Current (estimated conclusion March 2014)
 Universidade Federal do Rio Grande do Sul (UFRGS), Porto Alegre, Brazil

2004 – 2009 Bachelor in Computer Science
 Universidade Federal do Rio Grande do Sul (UFRGS), Porto Alegre, Brazil

Awards and Nominations

2009 Young Researcher Award in Exact Sciences (UFRGS)

2009 Best Work Award at the XXI Undergraduate Research Symposium (UFRGS)

2008 Nominated to the ACM Student Research Prize at OOPSLA (ACM SIGPLAN and Microsoft Research)

2007 Best Work Award at the XIX Undergraduate Research Symposium (UFRGS)

2007 Nominated to the Young Researcher Award in Exact Sciences, UFRGS (most prestigious award at my University)

2007 Best poster award at the *Genomics, Sequence Analysis, Evolution and Phylogeny session*, during the X-Meeting, Brazilian Association for Bioinformatics and Computational Biology

Languages

English Reading, writing and conversation: fluent

Portuguese Native speaker

French Intermediate (A2 Level): 3 years of Alliance Française plus five months living in France

Technology, Programming Languages and Tools

Language C# .NET 2.0 and Windows Forms – Windows CE 6.0 Platform Builder and Driver writing, .NET Compact Framework

Languages Java J2SE (since 2007), Perl (2 years, but out of contact 3 years from now), and C

UML 2.0 modeling (sequence, classes, use cases, activities, and interaction overview diagrams). XMI and SysML 1.1 modeling.

Formal method Alloy (1,5 year)

IDE environments Visual Studio 2008 Professional and Eclipse

CASE tools MagicDraw UML and TOPCASED

Attended Trainings

03/2009 SIMULINK for Aerospace System Design (training program offered by AIRBUS France, taught by The MathWorks company) 24 hours of training.

Past and Current Research & Development Projects

03/2010 - Embedded Systems Lab, Institute of Informatics, Federal University of Rio
Current Grande do Sul (UFRGS), Porto Alegre, Brazil

Role PhD Student

Project Hardware transient fault detection by software techniques.

Technologies Used ANSI C, Matlab, CUDA, LLVM compiler.

Results My PhD thesis investigates software techniques of fault tolerance against hardware transient faults. I have published three conference articles so far (DSD 2010, DFT 2011, IOLTS 2011), and a book chapter for the book "Adaptive Systems", which will be published by Springer-Verlag in 2012.

09/2009 – Allevo Genetics Ltda, Porto Alegre, Brazil
09/2011

Role Software Engineer & Project Manager – Company Co-founder

Project Equipment for automated DNA analysis.

Technologies Used C and C#, Visual Studio 2008, Windows CE 6, Platform Builder, Matlab, Windows CE driver writing in C, Microsoft Project

Results As a start-up company co-founder I was in charge of several activities in addition to the software-related ones. I was the project leader of a project founded by public investment in an order of R\$ 200,000.00 (around 129,000.00 USD) and by private investors in an order of R\$ 100,000.00 (around 65,000.00 USD). I was in charge of writing the founding proposal, deciding the expenses, being in contact with suppliers, and so on. In the software-related activities I was in charge of embedded software design for ARM-based platforms with Windows CE under the .NET Compact Framework, also in charge of the design of the algorithms for biological data processing based on image and signal processing. We have filled two patents during this period of time. I have a share summing 10% of Allevo Genetics.

03/2009 – Avionics Simulation Products Department, AIRBUS France S. A. S., Usine de
07/2009 Saint-Martin, Toulouse, France.

Role Research & Technology Intern on Systems Engineering

Project Development of new process and tools for embedded aircraft equipment design and simulation based on a model-based approach.

Technologies Used SysML, UML, Meta Object Facility (MOF), Query/View/Transformation (QVT), TOPCASED Tool, Eclipse, Java, ANSI C, SCADE.

<i>Results</i>	Semiformal integration and traceability between equipment design and simulation via SysML diagrams, changing the current approach based on semi-structured textual documents. Simulation activity was leveraged to the Application level of abstraction, instead of physical network messages inside equipment. Modeling of Aircraft systems, not only equipment signals, demonstrating good scaling-up provided by my project. C Code generation from SysML models to the AIRBUS equipment simulation platform. This project has shown the feasibility of using SysML models to large scale aircraft equipment modeling and specification, and the feasibility of code generation of a specified simulation from high level SysML models. I have developed a prototype tool chain to implement the proposed methodology, summing around 25.000 lines of Java code.
05/2007 – 03/2009	Embedded Systems Lab, Institute of Informatics, Federal University of Rio Grande do Sul (UFRGS), Porto Alegre, Brazil.
<i>Role</i>	Undergraduate Research Scholar of the Brazilian Science Council (CNPq)
<i>Project</i>	My research seeks Software Engineering techniques and their development for the embedded software domain. My former project was the coding of an Alloy formal model translator to Java code. I was studying context-oriented and prototype-based object-oriented languages targeting wireless sensor networks. The main goal was to enable easy software evolution and code deployment during runtime, in the scenario where the sensor node does not know the new software components interface.
<i>Technologies Used</i>	Language Java/J2SE, environment Eclipse. Modeling Language UML 2.0. Formal method Alloy. Metrics of Software Engineering. Theory and constructs of object-oriented languages (class and prototype-based ones). CUP and JFlex (Yacc and Flex implementations for Java). SUN's Squawk Java Virtual Machine.
<i>Results</i>	I have developed an Alloy model translator to Java code, written also in Java, summing around seven thousand lines of code. The aim was to synthesize correct-by-construction embedded software from formal Alloy models. My research was accepted to the Student Research Competition at the OOPSLA conference (the most prestigious conference on programming), held in November 2008 in Nashville/USA (this acceptance nominated my research to the ACM Student Prize). I have received the Excellence Award on Undergrad Research at my University, and I was nominated to the Young Research Prize at Exact Sciences at my University also. Finally, I have published a book chapter to a book on Embedded Software Engineering.
08/2004 – 01/2007	Center for Genomic and Molecular Biology (CBGM), Pontific Catholic University of Rio Grande do Sul (PUCRS), Porto Alegre, Brazil.
<i>Role</i>	Undergraduate Research Scholar of the Brazilian Science Council (CNPq)
<i>Project</i>	Design and development of applications for Bioinformatics (biological data analysis only) with C#. Design and implementation of algorithms in Perl and C for data processing generated in the Brazilian Genome Project. Integration of existing bioinformatics tools with Perl.
<i>Technologies</i>	Language C# over .NET 2.0 framework with Windows Forms. Environment

<i>Used</i>	Visual Studio 2005 Professional. Language Perl for scripting text processing of files with size of giga bytes.
<i>Results</i>	The developed software was called TraceViewer, and can be downloaded at http://traceviewer.sourceforge.net . In addition, I have developed around 20 Perl scripts and small C programs; they are not available for download because they are properties of the Brazilian Genome Project. I have published and attended to Genomics and Bioinformatics conferences, where at one of them I have received a best poster award.
01/2010 – 03/2010	Bullb Software
<i>Role</i>	Web Software Developer – Summer Job
<i>Techonologies Used</i>	Java (J2EE), Tomcat, PHP, MySQL, and CodeIgnitor PHP Framework
<i>Results</i>	This company is a recent start-up, thus I have contributed in prototyping their new products in order to present them to venture capitalists and potential clients. Recently, Bullb Software received an investment of R\$ 300.000,00 (around 159.000,00 USD) of venture capitalists based on the software prototype I have worked with.

Conferences Attended

2010	13 th Euromicro Conference on Digital System Design (DSD), Lille, France.
2009	Brazilian Symposium on Formal Methods (SBMF), Gramado, Brazil (I was on the organizing committee)
2008	ACM Conference on Object-Oriented Programming, Systems, Languages and Applications (OOPSLA), Nashville, United States
2007	3 rd International Conference of the Brazilian Association for Bioinformatics and Computational Biology (X-Meeting-AB3C), São Paulo, Brazil
2007	Microchip Road Show 16Bits, Porto Alegre, Brazil
2006	Workshop on Graph Theory and Applications, Porto Alegre, Brazil
2005	Brazil Agents School, Porto Alegre, Brazil
2005	First IFIP Academy on the State of Software Theory and Practice, Porto Alegre, Brazil
2005	4 th Latin American Network Operations and Management Symposium, Porto Alegre, Brazil
2005	51 st Brazilian Congress on Genetics, Águas de Lindóia, Brazil

Main Publications

FERREIRA, RR; MOREIRA, AF; CARRO, L. *Matrix Control-Flow Algorithm-Based Fault Tolerance*. In: 17th International On-line Test Symposium (IOLTS 2011), Athens. IEEE Computer Society Press, p. 43-48, 2011.

FERREIRA, RR; MOREIRA, AF; CARRO, L. *System Level Hardening by Computing with Matrices*. In: 13rd Euromicro Conference on Digital System Design (DSD 2010), Lille. IEEE Computer Society Press, p. 373-379.

ARGYRIDES, C; FERREIRA, RR; LISBOA, C; CARRO, L. *Decimal Hamming: A Novel Software-Implemented Technique to Cope with Soft Errors*. In: International Symposium on Defect and Fault Tolerance (DFT 2011), Vancouver. IEEE Computer Society, p. 37-42.

FERREIRA, RR; BRISOLARA, L; MATTOS, J; SPECHT, E; COTA, E; CARRO, L. *Engineering Embedded Software: from Application Modeling to Software Synthesis*. Behavioral Modeling for Embedded Systems and Technologies: Applications for Design and Implementation, Hershey: IGI Global Publisher, USA, chapter 10, ISBN 978-1-60566-750-8, p. 245-270, 2009.

OLIVEIRA, M.F.S.; FERREIRA, R.R.; NASCIMENTO, F.A.; RAMMIG, F.; WAGNER, F. *Exploiting the Model-Driven Engineering Approach to Improve Design Space Exploration of Embedded Systems*. In: 22nd IEEE/ACM Symposium on Integrated Circuits and System Design (SBCCI 2009), 2009, Natal. Proceeding of the 22nd IEEE/ACM SBCCI 2009. New York : ACM Press, 2009. (to appear in September 2009).

FERREIRA, RR. *Automatic code generation and solution estimate for object-oriented embedded software*. In: 23rd ACM Conference on Object-Oriented Programming Systems, Languages and Applications (OOPSLA 2008) Student Research Competition Session, 2008, Nashville. Companion to the 23rd ACM OOPSLA 2008. New York : ACM Press, 2008. p. 909-910.

FERREIRA, R.R.; GRAZZIOTIN, F.G.; FAGUNDES, N.J.R.; KANITZ, R.; BONATTO, S.L. *TraceViewer: Leveraging the Analysis of Multiple Chromatograms*. In: 3rd International Conference of the Brazilian Association for Computational Biology and Bioinformatics (X-Meeting AB3C 2007). Proceedings of the 3rd AB3C X-Meeting, 2007, São Paulo.