Rafael Keller Tesser

Curriculum Vitae

Software Developer | Researcher | Ph.D. in Computer Science

37 years old, Brazilian, resides in Porto Alegre, RS, Brazil

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I'm a software developer and researcher from Brazil. Having finished my Ph.D. last year, I am now looking forward to contributing to innovative and stimulating work, which allows me to improve my knowledge, while providing valuable real-world experience. I'm interested in a healthy work environment, with excellent career advancement opportunities.

Experience

- Experience in software development in the academic environment:
  - 15+ years of C programming experience;
  - Basic knowledge of Java and C++;
  - Good knowledge of shell-script and R;
  - Concurrent programming using PThreads and Objective-C threads;
  - Parallel programming with OpenMP and MPI.
- *10+ years of experience in parallel and distributed computing.*
- 15+ years of experience with the Linux operating system (installation, configuration, and utilization)
- Basic knowledge of administration of Linux servers.
- Experience in using parallel systems with shared and distributed memory (clusters).
- Filtering, processing, analysis, and visualization of data using shell-script and R.
- Experience in international cooperation efforts.

Previous work

- Modified and evaluated the use of assembly calls to improve a parallel application tracing library (C and PThreads).
- Developed a multi-thread version of the TRIVA visualization tool, to support asynchronous updates at execution time (Objective-C).
- Developed a hierarchical mechanism to collect distributed monitoring data for TRIVA (Objective-C on Linux).
- Modified the Ondes3D geophysics application to support dynamic load balancing through Adaptive MPI (AMPI). This resulted in up to 36% performance improvement on a 288-core cluster.
- Designed, implemented and evaluated a novel simulation workflow to estimate the benefits of dynamic load balancing, at low cost (based on the SimGrid simulator, using C and C++).
- Contributed to international research projects, such as HPC-GA and HPC4e.
- International collaboration with French institutions: INRIA Grenoble / LIG and BRGM (in his Ph.D. research).

Other experience

- Participated on the organization of courses, lectures, workshops, and conferences.
- Wrote papers published in recognized conferences and journals.
- Presented his work in several conferences and workshops, both in Portuguese and in English.
- Conducted three workshops on parallel programming, two of them providing direct assistance to the students, and a third one as the lecturer (part of the Intel Modern Code Partner Project at UFRGS).
- Mandatory teaching internships at UFRGS (20h each) on *Operating Systems* (2008) and *Advanced Computer Architectures* (2013).
- Was a teaching assistant on the *Data Structures* course at UFSM (2005).
- Taught short courses on subjects such as *Introduction to Linux,* and *Basic PHP*.

Academic education

Ph.D. in Computer Science (2018)

Universidade Federal do Rio Grande do Sul, UFRGS, Porto Alegre, Brazil

Sandwich Doctorate Internship in France (11-months, from June 2015 to April 2016), at *INRIA Grenoble / Laboratoire d'Informatique de Grenoble* (LIG)**.**

Thesis: *"A Simulation Workflow to Evaluate the Performance of Dynamic Load Balancing with Over-decomposition for Iterative Parallel Applications".*

Master's degree in Computer Science (2011)

Universidade Federal do Rio Grande do Sul, UFRGS, Porto Alegre, Brazil

Thesis: "*Monitoramento On-line em Sistemas Distribuídos: Modelo Hierárquico Para Coleta de Dados"* (Translation: *Online Monitoring of Distributed Systems: A Hierarchical Data-collection Model*).

Bachelor's degree in Computer Science (2007)

Universidade Federal de Santa Maria, UFSM, Santa Maria, Brazil

Final Monograph: *"Aperfeiçoamento da biblioteca libRastro de geração de rastros de execução de programas"* (Translation: *Improvements to the libRastro execution trace recording library*).

Skills and competencies

Experience in: computer programming; parallel programming; high-performance computing; instrumentation/tracing of parallel applications; performance analysis; performance modeling; simulation of distributed systems; cluster computing; processing, analysis and visualization of performance data; using shared parallel systems (e.g., Grid'5000); scientific research; scientific writing; presentation of scientific papers; organization of events.

Programming languages: C (advanced), shell-script (good), R (good), C++ (basic), Java (basic)

Tools, frameworks, libraries: MPI, OpenMP, PThreads, Adaptive MPI (AMPI), GNU R, Git, SVN, LaTeX, Linux, MS Windows, SimGrid, SSH, OAR (cluster resource allocation), Kadeploy (system image deployer)

Portfolio

Programas: https://bitbucket.org/rktesser | ***Datasets e scripts:*** https://zenodo.org/record/1289969

Languages

English	Understands Well, Speaks Well, Writes Well, Reads Well
French	Understands Little, Speaks Little, Writes Little, Reads Reasonably
Portuguese	Native speaker

Participation in Research Projects

[2018-2018] Intel Modern Code Partner UFRGS: The goals are to conduct Workshops on high-performance computing, to produce scientific research and to publish white-papers.

[2017-2018] GREEN-CLOUD *(in progress)*: It aims to create a cloud infrastructure for academic research, with support for high-performance computing. It's design must be sensitive to demands for rational energy usage.

[2016-2018] HPC4e - HPC for Energy*:* Brazil-Europe collaboration project., which aimed to apply the new exascale HPC techniques to energy industry simulations.

[2012-2013] LAGClima Project: Continuation of the AMSUD-GBRAMS project, aiming to build upon the previous results, using the Grid between the international partners to compute a climatology of the Río de La Plata.

[2012-2014] HPC-GA - High-Performance Computing for Geophysics Applications: International cooperation project between UFRGS (Brazil), INRIA (France), BCAM (Spain), UNAM (Mexico), aimed at developing and porting geophysics applications for heterogeneous environments (with multicore processors and GPU accelerators), and elaborate proposals for efficient scheduling and intelligent data distribution in such platforms.

[2010-2012] CLIMARS - Impactos no Clima do Rio Grande do Sul devido a Mudança de Uso do Solo e Consequências nos Ciclos Agrícola e Hidrológico: Evaluation of the impact of climatic change in the state of Rio Grande do Sul, and study of the dispersion of pollutants under different climatic conditions. ***Funding:*** FINEP/Brazil.

[2009-2010] Projeto Atmosfera Massiva: This project had the objective of studying the impact of multicore architectures and multilevel parallelism in meteorological an environmental models.

[2007-2007] Java WSPAD: Development of a Java system for environments with multi-clusters and a web-server based manager for launching (executing) applications. This was a cooperation between UFRGS and COPPE/UFRJ.

Bibliographic production

- 1 paper in the international scientific journal *Concurrency and Computation: Practice and Experience* (2018)
- 3 papers in international scientific events (CLCAR 2010, PDP 2012, PDP 2014, and Euro-Par 2017)
- 1 extended abstract in a Brazilian scientific event (WSCAD-CTIC 2018)

Courses taught

- **Curso básico de PHP** (Basic PHP course), at UFSM. 2006. Duration: 9 hours.
- **Curso de Introdução ao GNU/Linux** (Introduction to GNU/Linux), at UFSM, 2006. Duration: 6 hours.
- Workshop: **Introdução à Programação Paralela e Vetorial para Arquiteturas Intel**, on the Academic Week of the Computation Course (SEMAC/UFRGS), 2018. Duration: 4 hours.

Organization of events

Member of the organizing committee of *CLCAR 2010* (international conference) and *I Expansão: Ciclo de Palestras Integradas (multidisciplinary event, local to UFSM)*. Besides several project-related workshops.

Participation in events

- Oral presentation of scientific papers at CLCAR 2010, PDP 2012, PDP 2014, Euro-Par 2017.
- Attendee at SBAC-PAD 2007, 2008, 2010, and 2011.