# Pedro Bruel | Researcher & Software Engineer

Performance Modeling & Optimization • Statistical Learning

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## Experience

**Jan '20 - Dec '20** — **Research & Project Management**
*University of São Paulo, Brazil*
*with Hewllett Packard Enterprise*
Developing Statistical Learning software in Julia, helping to manage 1 undergraduate and 4 masters students in applying modeling and optimization methods to diverse High Performance Computing domains

**Nov '19 - Jan '20** — **Visiting Researcher**
*Hewllett Packard Enterprise, Palo Alto*
Developing autotuners based on Statistical Learning for Neural Networks and Deep Learning hardware accelerators

**Nov '17 - Dec '20** — **Research & Software Engineering**
*Grenoble Informatics Laboratory*
*University of Grenoble Alpes, France*
Developing Design of Experiments Techniques for autotuning High-Performance Computing kernels and compilers on CPUs, GPUs and FPGAs

**Jan '15 - Aug '20** — **Research & Software Engineering**
*Software Systems Laboratory*
*University of São Paulo, Brazil*
Developing autotuners for High-Level Synthesis compilers for FPGAs and for the CUDA Compiler using Search Heuristics

**Jan '15 - Jan '16** — **Research & Software Engineering**
*University of São Paulo, Brazil*
*with Hewllett Packard Enterprise*
Developed an autotuner for the LegUp High-Level Synthesis compiler for Altera FPGAs using Search Heuristics

**Jan '12 - Jan '14** — **Research Internship**
*Computer Music Research Group*
*University of São Paulo, Brazil*
Maintained and developed a Multiagent System for music composition via agent interaction

## Select Publications

**Bruel, P.**, Quinito Masnada, S., Videau, B., Legrand, A., Vincent, J. M., and Goldman, A., **2019**. *Autotuning Under Tight Budget Constraints: A Transparent Design of Experiments Approach*. 19th IEEE/ACM International Symposium on Cluster, Cloud and Grid Computing (CCGRID).

**Bruel, P.**, Goldman, A., Chalamalasetti, S.R. and Milojicic, D., **2017**. *Autotuning high-level synthesis for FPGAs using OpenTuner and LegUp*. ReConFigurable Computing and FPGAs (ReConFig), International Conference.

**Bruel, P.**, Chalamalasetti, S.R., Dalton, C., El Hajj, I., Goldman, A., Graves, C., Hwu, W.M., Laplante, P., Milojicic, D., Ndu, G. and Strachan, J.P., **2017**. *Generalize or Die: Operating Systems Support for Memristor-based Accelerators*. IEEE International Conference on Rebooting Computing (ICRC).

**Bruel, P.**, Amarís, M. and Goldman, A., **2017**. *Autotuning CUDA compiler parameters for heterogeneous applications using the OpenTuner framework*. Concurrency and Computation: Practice and Experience.

## Education

**2015 – 2020** — **PhD in Computer Science**
*University of Grenoble Alpes, France*
*University of São Paulo, Brazil*
High-Performance Computing, Autotuning, Design of Experiments, Search Heuristics, Data Analysis

**2010 – 2014** — **BsC in Molecular Sciences**
*University of São Paulo, Brazil*
Multiagent Systems, Digital Signal Processing

## Languages

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|---|---|---|
| Portuguese | *CEFR C2* | Native |
| English | *CEFR C2* | Fluent |
| French | *CEFR C1* | Proficient |
| Spanish | *CEFR A2* | Basic |

## Skills

**Modeling & Optimization**
Search Heuristics, Optimal Design, Statistical Learning, Gaussian Process Regression, Sensitivity Analysis, ANOVA

**Software Engineering**
Python, Julia, R, Bash, Pytorch, C/C++, OpenMP, pthreads, MPI, CUDA C, Java, Automated Testing, Continuous Integration

**Tools and Infrastructure**
GNU/Linux, Git, Grid5000, GCE/AWS, LaTeX, Emacs, Vim, tidyverse, Jupyter