

# JOSÉ CAMPOS

## PERSONAL INFORMATION

*Was born in Portugal, 29 January 1986*

*email*      [jmcampos@uw.edu](mailto:jmcampos@uw.edu)  
*skype*      zecarlosdecampos  
*website*    <https://jose.github.io>  
*github*     <https://github.com/jose>  
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## RESEARCH EXPERIENCE

*Nov 2018–...*      Research Associate

*University of  
Washington*

Advance empirical methodologies and infrastructures, in particular DEFECTS4J; advance the state of the art in automated software debugging; and advance the state of the art in automated software testing and software vulnerability detection.

Reference: Dr. René JUST · [rjust@cs.washington.edu](mailto:rjust@cs.washington.edu)

*Sept 2014–Jan  
2017*      Teaching Assistant

*The University of  
Sheffield*

Supported master students on advanced software testing activities.

Reference: Dr. Gordon FRASER · [gordon.fraser@sheffield.ac.uk](mailto:gordon.fraser@sheffield.ac.uk) and Dr. Kirill BOGDANOV · [k.bogdanov@sheffield.ac.uk](mailto:k.bogdanov@sheffield.ac.uk)

*Jun 2012–  
Nov 2013*      Research Assistant

*University of Porto  
Faculty of  
Engineering*

Investigated the use of generic invariants in software projects, their relation with existing test oracles, and their runtime overhead.

Reference: Dr. Rui ABREU · [rui@computer.org](mailto:rui@computer.org)

*Feb–Jul 2010*      Teaching Assistant

*University of Porto  
Faculty of  
Engineering*

Helped and guided undergrad students at developing low level and embedded software.

Reference: Dr. Rui ABREU · [rui@computer.org](mailto:rui@computer.org)

## EDUCATION

*Dec 2013–Dec  
2017*      The University of Sheffield, United Kingdom

*Doctor of  
Philosophy (PhD)*

Search-based Unit Test Generation for Evolving Software

Description: This PhD thesis investigates the applicability of evolutionary algorithms at automatically generating unit test cases for object-oriented software. In summary, it answers the following questions: 1) Which coverage criteria should test generation algorithms use in order to produce the best test suites? 2) Which algorithms are more effective at generating test cases with high coverage and that are able to detect software faults? 3) How to scale up test generation algorithms and tools to software projects consisting of large numbers of components, evolving and changing frequently over time?

Supervisors: Dr. Gordon FRASER · [gordon.fraser@sheffield.ac.uk](mailto:gordon.fraser@sheffield.ac.uk) and Dr. Rui ABREU · [rui@computer.org](mailto:rui@computer.org)

*Set 2006–Fev  
2012*      University of Porto, Portugal

*Master in  
Informatics and  
Computing  
Engineering*

Regression Testing with GZOLTAR: Techniques for Test Suite Minimization, Selection, and Prioritization

Description: This thesis explores and proposes a new approach to reduce the effort of re-testing a software project.

Supervisor: Dr. Rui ABREU · [rui@computer.org](mailto:rui@computer.org)

## SCIENTIFIC PUBLICATIONS

- [1] José Campos, Yan Ge, Nasser Albusian, Gordon Fraser, Marcelo Eler, and Andrea Arcuri. An empirical evaluation of evolutionary algorithms for unit test suite generation. *Information and Software Technology*, 104:207–235, 2018.
- [2] José Campos, Yan Ge, Gordon Fraser, Marcelo Eler, and Andrea Arcuri. An Empirical Evaluation of Evolutionary Algorithms for Test Suite Generation **Distinguished Paper Award**. In Tim Menzies and Justyna Petke, editors, *Proceedings of the 9th International Symposium Search-Based Software Engineering (SSBSE)*, pages 33–48. Springer International Publishing, Cham, 2017.
- [3] Spencer Pearson, José Campos, René Just, Gordon Fraser, Rui Abreu, Michael D. Ernst, Deric Pang, and Benjamin Keller. Evaluating and improving fault localization. In *Proceedings of the 39th ACM/IEEE International Conference on Software Engineering, ICSE '17*, pages 609–620, Piscataway, NJ, USA, 2017. IEEE Press.
- [4] Sina Shamshiri, José Campos, Gordon Fraser, and Phil McMinn. Disposable Testing: Avoiding Maintenance of Generated Unit Tests by Throwing Them Away. In *Proceedings of the 39th ACM/IEEE International Conference on Software Engineering, ICSE '17*, pages 207–209, 2017.
- [5] Gordon Fraser, José Miguel Rojas, José Campos, and Andrea Arcuri. EvoSuite at the SBST 2017 Tool Competition. In *Proceedings of the 10th International Workshop on Search-Based Software Testing, SBST '17*, pages 39–42, 2017.
- [6] Andrea Arcuri, José Campos, and Gordon Fraser. Unit Test Generation During Software Development: EvoSuite Plugins for Maven, IntelliJ and Jenkins. In *Proceedings of the 2016 IEEE Ninth International Conference on Software Testing, Verification and Validation, ICST '16*, pages 401–408, Washington, DC, USA, 2016. IEEE Computer Society.
- [7] Ermira Daka, José Campos, Gordon Fraser, Jonathan Dorn, and Westley Weimer. Modeling Readability to Improve Unit Tests **ACM SIGSOFT Distinguished Paper Award**. In *Proceedings of the 2015 10th Joint Meeting on Foundations of Software Engineering, ESEC/FSE 2015*, pages 107–118, New York, NY, USA, 2015. ACM.
- [8] José Miguel Rojas, José Campos, Mattia Vivanti, Gordon Fraser, and Andrea Arcuri. Combining Multiple Coverage Criteria in Search-Based Unit Test Generation **Best Paper with industry-relevant SBSE results**. In Márcio Barros and Yvan Labiche, editors, *Proceedings of the 7th International Symposium Search-Based Software Engineering (SSBSE)*, volume 9275 of *Lecture Notes in Computer Science*, pages 93–108. Springer International Publishing, 2015.
- [9] José Campos, Gordon Fraser, Andrea Arcuri, and Rui Abreu. Continuous Test Generation on Guava. In Márcio Barros and Yvan Labiche, editors, *Proceedings of the 7th International Symposium Search-Based Software Engineering (SSBSE)*, volume 9275 of *Lecture Notes in Computer Science*, pages 228–234. Springer International Publishing, 2015.
- [10] Ermira Daka, José Campos, Jonathan Dorn, Gordon Fraser, and Westley Weimer. Generating Readable Unit Tests for Guava. In Márcio Barros and Yvan Labiche, editors, *Proceedings of the 7th International Symposium Search-Based Software Engineering (SSBSE)*, volume 9275 of *Lecture Notes in Computer Science*, pages 235–241. Springer International Publishing, 2015.
- [11] José Campos, Andrea Arcuri, Gordon Fraser, and Rui Abreu. Continuous Test Generation: Enhancing Continuous Integration with Automated Test Generation. In *Proceedings of the 29th ACM/IEEE International Conference on Automated Software Engineering, ASE '14*, pages 55–66, New York, NY, USA, 2014. ACM.
- [12] José Campos, Rui Abreu, Fraser Gordon, and Marcelo d'Amorim. Entropy-based Test Generation for Improved Fault Localization. In *Proceedings of the 28th IEEE/ACM International Conference on Automated Software Engineering, ASE 2013*, pages 257–267, New York, NY, USA, 2013. ACM.
- [13] Carlos Gouveia, José Campos, and Rui Abreu. Using HTML5 Visualizations in Software Fault Localization. In *Proceedings of the 1st IEEE Working Conference on Software Visualization (co-located with International Conference on Software Maintenance, ICSM), VISSOFT 2013*, pages 1–10, Washington, DC, USA, 2013. IEEE Computer Society.
- [14] Pedro Machado, José Campos, and Rui Abreu. MZoltar: Automatic Debugging of Android Applications.

In *Proceedings of the 1st International Workshop on Software Development Lifecycle for Mobile (co-located with European Software Engineering Conference and the ACM SIGSOFT Symposium on the Foundations of Software Engineering, ESEC/FSE)*, DeMobile 2013, pages 9–16, New York, NY, USA, 2013. ACM.

- [15] José Campos and Rui Abreu.  
Leveraging a Constraint Solver for Minimizing Test Suites.  
In *Proceedings of the The Symposium on Engineering Test Harness (co-located with QSIC)*, TSE-TH 2013, pages 253–259, Washington, DC, USA, 2013. IEEE.
- [16] José Campos and Rui Abreu.  
Encoding Test Requirements as Constraints for Test Suite Minimization.  
In *Proceedings of the 10th International Conference on Information Technology: New Generations*, ITNG 2013, pages 317–322, Washington, DC, USA, 2013. IEEE Computer Society.
- [17] José Campos, André Ribeiro, Alexandre Perez, and Rui Abreu.  
GZoltar: An Eclipse Plug-in for Testing and Debugging.  
In *Proceedings of the 27th IEEE/ACM International Conference on Automated Software Engineering*, ASE 2012, pages 378–381, New York, NY, USA, 2012. ACM.
- [18] André Ribeiro, Rui Rodrigues, Rui Abreu, and José Campos.  
Integrating Interactive Visualizations of Automatic Debugging Techniques on an Integrated Development Environment.  
*IJCICG*, 3(2):42–59, 2012.

#### EVENTS

<i>Conference</i>	<i>Aug 2019</i>	Program Committee	The 11th Symposium on Search-Based Software Engineering (SSBSE)
<i>Conference</i>	<i>Sept 2015</i>	Student Volunteer	The 10th Joint Meeting of the European Software Engineering Conference and the ACM SIGSOFT Symposium on the Foundations of Software Engineering (ESEC/FSE)
<i>Conference</i>	<i>May 2015</i>	Student Volunteer	The 37th International Conference on Software Engineering (ICSE)
<i>Summer School</i>	<i>Jun 2014</i>	Organising Committee	The 10th International Summer School on Training And Research On Testing (TAROT)
<i>Conference</i>	<i>Nov 2013</i>	Student Volunteer	The 28th IEEE/ACM International Conference on Automated Software Engineering (ASE)

#### CO-SUPERVISOR

<i>Institution</i>	<i>Sept 2014–Jul 2015</i>	A Multi-Objective Optimization Approach to Test Suite Reduction	University of Porto · Faculty of Engineering
<i>Degree</i>			Master in Informatics and Computing Engineering
<i>Student</i>			Jorge Costa
<i>Supervisor</i>			Dr. Rui ABREU · <a href="mailto:rui@computer.org">rui@computer.org</a>
<i>Institution</i>	<i>Sept 2013–Jul 2014</i>	Defining a Test Automation System for Mobile Apps	University of Porto · Faculty of Engineering
<i>Degree</i>			Master in Informatics and Computing Engineering
<i>Student</i>			Renato Rodrigues
<i>Supervisor</i>			Dr. Rui ABREU · <a href="mailto:rui@computer.org">rui@computer.org</a>
<i>Institution</i>	<i>Sept 2012–Jun 2013</i>	HTML5-based Visualizations to Support Software Fault Isolation	University of Porto · Faculty of Engineering
<i>Degree</i>			Master in Informatics and Computing Engineering
<i>Student</i>			Carlos Gouveia
<i>Supervisor</i>			Dr. Rui ABREU · <a href="mailto:rui@computer.org">rui@computer.org</a>
	<i>Sept 2012–Jun 2013</i>	Generating Asserts for Test Cases Efficiently	

*Institution* University of Porto · Faculty of Engineering  
*Degree* Master in Informatics and Computing Engineering  
*Student* Luís Pinho  
*Supervisor* Dr. Rui ABREU · [rui@computer.org](mailto:rui@computer.org)

Sept 2012– Jun 2013 Automatic Debugging of Android Applications

*Institution* University of Porto · Faculty of Engineering  
*Degree* Master in Informatics and Computing Engineering  
*Student* Pedro Machado  
*Supervisor* Dr. Rui ABREU · [rui@computer.org](mailto:rui@computer.org)

**PERSONAL SKILLS AND COMPETENCES**

*Mother tongue(s)* Portuguese

*Self-assessment* English

*Social skills and competences*

- Ability to work independently or as part of a team
- Good oral and written communication
- Ability to listen and understand the opinion of each element of the team
- Responsible, confident, conscience and sincere
- Ability to take initiative when necessary
- Determination and willingness to learn

*Organizational skills and competences*

- Ability to organize time and tasks
- Sense of responsibility

*Technical skills and competences*

Java	
★★★ Proficient	Designed and developed a framework called GZOLTAR which provides the infrastructure to automatically debug Java applications, and contributed to a tool called EvoSUITE which is able to automatically generate unit test cases for Java applications
Apache Maven, Apache Ant, and Jenkins CI	
★★☆ Good Knowledge	Developed GZOLTAR's Maven and Ant plugins, and EvoSUITE's Maven and Jenkins plugins
PHP	
★★☆ Good Knowledge	Created a web-based custom and lightweight MVC framework called PHPMvc
C/C++	
★☆☆ Basic Knowledge	Developed basic academic projects
JavaScript	
★☆☆ Basic Knowledge	Developed basic JavaScript code for the PHPMvc framework
SQL	
★★☆ Good Knowledge	Developed basic SQL code for the PHPMvc framework
Python	
★★☆ Good Knowledge	Developed a few python scripts of a couple of hundred lines of code to automate research experiments
Bash	
★★★ Proficient	Developed shell scripts for Unix systems to automate research experiments and/or daily tasks
R	
★★☆ Good Knowledge	Performed advanced statistic analysis for all scientific publications
L <sup>A</sup> T <sub>E</sub> X	
★★★ Proficient	Produced high quality documents (i.e., all scientific publications)

GZOLTAR project webpage, <http://www.gzoltar.com>  
 EvoSUITE project webpage, <http://www.evosuite.org>  
 PHPMvc project webpage, <http://github.com/jose/phpmvc>  
 All scientific publications can be found at <http://jose.github.io/publications>