Marcelo André Barbosa de Sousa

Rue de Carouge 36BIS
1205 Geneva, Switzerland

Date of Birth: August 17, 1988
Citizenship: Portuguese
Email: marceloabsousa@gmail.com

Education

DPhil. Computer Science, University of Oxford, United Kingdom.

Duration: January 2013 - 2018

Advisors: Prof. Daniel Kroening, and Prof. Luke Ong

Dissertation

Title: Abstractions and Independence
Examiners: Prof. Marta Kwiatkowska and Prof. Parosh Aziz Abdulla

MSc. Computing Science, Universiteit Utrecht, The Netherlands.

Duration: September 2009 - August 2012

Advisors: dr. Wishnu Prasetya and Prof. Alper Şen

Thesis

Title: A Framework for Formal Verification of Concurrent Software
Examiners: Prof. Doaitse Swierstra and Prof. Alper Şen

Final GPA: 4.0/4.0

Erasmus: MSc. Computer Engineering, Boğaziçi Üniversitesi, Turkey.

BSc. Informatics Engineering, Universidade do Minho, Portugal.

Duration: September 2006 - July 2009

Thesis

Title: Determining readability levels in text analysis for content quality
Examiners: Prof. Maarten de Rijke

ECTS Grade: A

Erasmus: MSc. Computer Science, Universiteit van Amsterdam, The Netherlands.

Industrial Experience

SonarSource, Geneva

Static Analysis Scientist, February 2018-
Principal designer of generic information flow security analysis.
Principal designer of DSLs for language-agnostic static analysis.

DiffBlue, Oxford

Research Engineer Consultant, February 2016–2017
Dynamic analysis of concurrent programs based on partial order reductions.

Google Inc., Mountain View

Software Engineer Intern, Vijay D'Silva, Domagoj Babic, August 2015– December 2015.
One order of magnitude speed-up of call graph construction for Android applications.

Microsoft Research Cambridge

Research Intern, Isil Dillig, Byron Cook, September 2013– November 2013.
Designed program consolidation, a program optimisation to scale massively paralel applications.
Implemented a prototype of program consolidation in the context of queries written in C# LINQ.

MarketPsych Data

Haskell Consultant, Richard L. Peterson, January 2012– September 2013.
Implementation of the Thomson Reuters MarketPsych Indices.

CERN - European Organization for Nuclear Research

Summer Student, Fons Rademakers, July– September 2011.
ROOT I/O Plugins for Amazon S3 and Google Storage.

IBM Toronto Laboratories

Co-op XlC Front-End, Jeffrey Heath, March-September 2010.
Software engineering and research in the XlC Front-end – part of the IBM XL Compiler organization.

Academic Experience

Merton College, Oxford

Undergraduate Tutor

Imperative Programming I, Hilary Term 2015.

Object Oriented Programming, Michaelmas Term 2014.

Imperative Programming II, Hilary Term 2014, Hilary Term 2015.

St John's College, Oxford

Undergraduate Tutor

Imperative Programming II, Trinity Term 2015.

Worcester College, Oxford

Undergraduate Tutor

Compilers, Trinity Term 2015.

University of Oxford, Department of Computer Science

Teaching Assistant, MSc in Software Engineering

Robust Programming, July 2015.
eXtensible Markup Language, March 2015.

Class Tutor

Software Verification, Hilary Term 2015.
Computer-Aided Formal Verification, Michaelmas Term 2014.
Object Oriented Programming, Michaelmas Term 2014.
Principles of Programming Languages, Michaelmas Term 2014.

Practicals Demonstrator

Imperative Programming I, Hilary Term 2014.

Boğaziçi Üniversitesi, Department of Computer Engineering of the Faculty of Engineering

Research Assistant, Alper Şen, February 2012 – October 2012.
Formal Verification of Concurrent Software

Universiteit van Amsterdam, Intelligent Systems Lab Amsterdam, Informatics Institute

Research Assistant, Maarten de Rijke,Valentin Jijkoun, October– 2009.
Sentimental Analysis for Philips User Generated Content

Universidade do Minho, Physics Center, Physics Department

Junior Researcher, Ricardo Mendes Ribeiro, October 2008 - 2009.
Implementation of parallel software for solid state physics simulations

Research

Students

Sarah Sallinger (co-supervised with Prof. Viktor Kuncak)
Scalable declarative static analysis
MSc. Computer Science, EPFL, 2019 (expected)

Quentin Jaquier (co-supervised with Prof. Viktor Kuncak and Dinesh Bolkensteyn)
Belief-style checkers over universal abstract syntax trees
MSc. Computer Science, EPFL, 2019 (expected)

Alberto Sadde (co-supervised with Prof. Daniel Kroening)
Consolidation of Haskell Programs: Semantic Fusion of maps, filters and folds
MSc. Computer Science, University of Oxford, 2016

Peer-Reviewed Publications

Marcelo Sousa, Isil Dillig, Shuvendu Lahiri
Verified Three-way Program Merge
Object-Oriented Programming, Systems, Languages And Applications, November 2018.

Huyen T. T. Nguyen, Cesar Rodriguez, Marcelo Sousa, Camille Coti, Laure Petrucci
Quasi-Optimal Partial Order Reduction
Computer Aided Verification, July 2018.

Marcelo Sousa, Cesar Rodriguez, Vijay D'Silva, Daniel Kroening
Abstract Interpretation with Unfoldings
Computer Aided Verification, July 2017.

Vijay D'Silva, Marcelo Sousa, Daniel Kroening
Independence Abstractions and Models of Concurrency
Verification, Model Checking, and Abstract Interpretation, January 2017.

Vijay D'Silva, Marcelo Sousa
Complete Abstractions and Subclassical Modal Logics
Verification, Model Checking, and Abstract Interpretation, January 2017.

Marcelo Sousa, Isil Dillig
Cartesian Hoare Logic for Verifying k-Safety Properties
Programming Language Design and Implementation, June 2016.

Cesar Rodriguez, Marcelo Sousa, Subodh Sharma, Daniel Kroening
*Unfolding-based Partial Order Reduction (**Best Paper Award**)*
International Conference on Concurrency Theory, September 2015.

Marcelo Sousa, Isil Dillig, Dimitrios Vytionitis, Thomas Dillig, Christos Gkantsidis
Consolidation of Queries with User-Defined Functions
Programming Language Design and Implementation, June 2014.

Marcelo Sousa, Alper Sen
LLVMVF: A Generic Approach for Verification of Multicore Software
Journal of Electronic Testing: Theory and Applications, September 2013.

Marcelo Sousa, Alper Sen
Generation of TLM Testbenches Using Mutation Testing
International Conference on Hardware/Software Codesign and System Synthesis, October 2012.

Scientific Software

SafeMerge: Verification of Conflict Freedom in Program Merges (2018).

APOET: Abstract Interpreter with Unfoldings (2017).

DESCARTES: Cartesian Hoare Logic Verifier for Java (2015).

POET: Partial Order Execution Tools (2015).

LLVMVF: LLVM Verification Framework for Concurrent Software (2012).

Amazon S3 and Google Storage Plugins for ROOT (CERN) (2011).

Readability for Dutch, A tool for readability analysis of Dutch texts (2009).

Deposition, A Fortran MPI program for generic thin films deposition simulation, with Ricardo Mendes Ribeiro (2009).

Research Visits

Dagstuhl Seminar on Program Equivalence, April 2018.

Seminar on Automata, Logic and Games, IMS Singapore, September 2016.

Cesar Rodriguez, Paris 13, France, March 2016.

Isil Dillig, University of Texas at Austin, USA, May 2015.

Selected Presentations

Verified Three-way Program Merge
Object-Oriented Programming, Systems, Languages And Applications, November 2018.

Event Structures and Applications to Program Equivalence
Dagstuhl Seminar on Program Equivalence, April 2018.

Causality-Based Abstract Interpretation = Super-Optimal DPOR + Abstraction
EPFL Seminar, October 2017.

Abstract Interpretation with Unfoldings
Computer Aided Verification, July 2017.

Independence Abstractions and Models of Concurrency
Verification, Model Checking, and Abstract Interpretation, January 2017.

Partial Order Reduction, Unfoldings and SAT solvers
IMS Singapore, September 2016.

Redundancy-aware Reasoning of Concurrent Programs
Google, Mountain View, August 2016.

Cartesian Hoare Logic for Verifying k-Safety Properties
Programming Language Design and Implementation, June 2016.

Consolidation of Queries with User-Defined Functions
Programming Language Design and Implementation, June 2014.

Type Systems for Low-level Safety
Princeton University, August 2013.

Generation of TLM Testbenches Using Mutation Testing,
CODES+ISSS 2012, Tampere, Finland, October 2012.

Professional Activities

PC Member: CAV 2019, CAVAEC 2016.

External Reviewer: TOPLAS, CAV 2018, POPL 2018, FMCAD 2016, ISSTA 2016, CAV 2015, VMCAI 2015, ESOP 2014, FMCAD 2014, ICCD 2014, ICECCS 2014, VMCAI 2014, VSTTE 2014, ICCD 2013.

Organizer: ICFP Contest 2014.

Honors and Awards

Google PhD Fellowship in Programming Languages and Software Engineering, 2016.

Best Paper Award at CONCUR, September 2015.

One Year Grant to Innovative Enterpreneurs, IAPMEI Portugal, September 2013-2014.

Featured IBM DB2 Student Ambassador, April 2009.

FCT (Portuguese Foundation for Science and Technology) Computational Physics Scholarship, October 2008-2009.

Third Prize – National contest organized by Fundação da Juventude (Portuguese Youth Foundation) in Traffic Collision, January 2009.

Last updated: January 6, 2019