

RODRIGO BRUNO

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Publications: Google Scholar

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Address: Office 534, R. Alves Redol 9, 1000-029 Lisbon, Portugal

Research Interests: Language Runtimes; Cloud Computing; Systems; Programming Languages

EDUCATION

ETH Zurich , Switzerland Postdoc, Systems Group Mentored by Prof. Gustavo Alonso	<i>2018 - 2020</i>
Instituto Superior Técnico, University of Lisbon , Portugal PhD in Information Systems and Computer Engineering Thesis: novaVM: Enhanced Java Virtual Machine for Big Data Applications Advised by Prof. Paulo Ferreira	<i>2014 - 2018</i> Pass with Distinction and Honour
Instituto Superior Técnico, University of Lisbon , Portugal Msc in Information Systems and Computer Engineering Thesis: freeCycles: Efficient Data Distribution for Volunteer Computing Advised by Prof. Paulo Ferreira	<i>2012 - 2014</i> Final Grade: 18/20
Instituto Superior Técnico, University of Lisbon , Portugal BSc in Information Systems and Computer Engineering	<i>2009 - 2012</i> Final Grade: 17/20

PROFESSIONAL EXPERIENCE

Visiting Scholar , Imperial College London, UK	(3 months) 2023
Visiting Scholar , Purdue University, West Laffayette, USA	(3 months) 2023
Assistant Professor , Instituto Superior Técnico, University of Lisbon, PT	2021 - present
Senior Researcher , INESC-ID Lisbon, PT	2021 - present
Senior Researcher , Oracle Lab Zurich, CH	2020 - 2021
Research Intern , Google, Munich, DE	(3 months) 2018
Jelastic Research Collaboration (remote)	(3 months) 2017
Research Intern , Microsoft Research, Cambridge, UK	(3 months) 2017
Feedzai Research Collaboration , Lisbon, PT	(3 months) 2016
SysAdmin , RNL, Instituto Superior Técnico, University of Lisbon, PT	2013 - 2015
Research Intern , INESC-ID Lisbon, PT	(3 months) 2011

PUBLICATIONS

CONFERENCE PAPERS:

Off-the-shelf Data Analytics on Serverless

Conference on Innovative Data Systems Research (CIDR) 2024
Michael Wawrzoniak, [Rodrigo Bruno](#), Ana Klimovic, Gustavo Alonso

Pronghorn: Effective Checkpoint Orchestration for Serverless Hot-Starts

International European chapter of ACM SIGOPS (EuroSys) 2024
Sumer Kohli, Shreyas Kharbanda, [Rodrigo Bruno](#), Joao Carreira, Pedro Fonseca

Heap Size Adjustment with CPU Control

International Conference on Managed Programming Languages & Runtimes (MPLR) 2023
Sanaz Tavakolisomah, Marina Simchenko, Erik Osterlunc, [Rodrigo Bruno](#), Paulo Ferreira, Tobias Wrigstad

CloudJIT: a Just-in-Time FaaS Optimizer

International Conference on Managed Programming Languages & Runtimes (MPLR) 2023
Serhii Ivanenko, [Rodrigo Bruno](#), Jovan Stevanovic, Vojin Jovanovic

EdgeEmu - Emulator for Android Edge Devices

International Conference on Distributed Applications and Interoperable Systems (DAIS) 2023
Lyla Vijouyeh, [Rodrigo Bruno](#), Paulo Ferreira

Selecting a GC for Java Applications

Norwegian Informatics Conference (NIK) 2021
Sanaz Tavakolisomah, [Rodrigo Bruno](#), Paulo Ferreira

Specializing Generic Java Data Structures

Managed Programming Languages and Runtimes (MPLR) 2021
Dan Graur, [Rodrigo Bruno](#), Gustavo Alonso

Naos: Serialization-free RDMA networking in Java

Annual Technical Conference (ATC) 2021
Konstantin Taranov, [Rodrigo Bruno](#), Gustavo Alonso, Torsten Hoefler

Compiler-Assisted Object Inlining with Value Fields

Programming Language Design and Implementation (PLDI) 2021
[Rodrigo Bruno](#), Vojin Jovanovic, Christian Wimmer, Gustavo Alonso

Boxer: Data Analytics on Network-enabled Serverless Platforms

Conference on Innovative Data Systems Research (CIDR) 2021
Michal Wawrzoniak, Ingo Mueller, [Rodrigo Bruno](#), Gustavo Alonso

Photons: Lambdas on a diet

ACM Symposium on Cloud Computing (SoCC) 2020
Vojislav Dukic, [Rodrigo Bruno](#), Ankit Singla, Gustavo Alonso

Runtime Object Lifetime Profiler for Latency Sensitive Big Data Applications

EuroSys 2019
[Rodrigo Bruno](#), Duarte Patrício, José Simão, Luís Veiga, Paulo Ferreira

Graviton: Trusted Execution Environments on GPUs

USENIX Symposium on Operating Systems Design and Implementation (OSDI) 2018
Stavros Volos, Kapil Vaswani, [Rodrigo Bruno](#)

Dynamic Vertical Memory Scalability for OpenJDK Cloud Applications

International Symposium on Memory Management (ISMM) 2018

Rodrigo Bruno, Paulo Ferreira, Ruslan Synytsky, Tetiana Fydorenchyk, Jia Rao, Hang Huang, Song Wu

POLM2: Automatic Profiling for Object Lifetime-Aware Memory Management for HotSpot Big Data Applications

ACM/IFIP Middleware 2017

Rodrigo Bruno, Paulo Ferreira

Locality-Aware GC Optimisations for Big Data Workloads

OTM Conferences – C&CT 2017

Duarte Patrício, Rodrigo Bruno, José Simão, Paulo Ferreira, Luís Veiga

NG2C: Pretenuring Garbage Collection with Dynamic Generations for HotSpot Big Data Applications

International Symposium on Memory Management (ISMM) 2017

Rodrigo Bruno, Luís Picciochi Oliveira, Paulo Ferreira

ALMA - GC-assisted JVM Live Migration for Java Server Application

ACM/IFIP Middleware 2016

Rodrigo Bruno, Paulo Ferreira

Asynchronous Complete Garbage Collection for Graph Data Stores

ACM/IFIP Middleware 2015

Luís Veiga, Rodrigo Bruno, Paulo Ferreira

Termite: Emulation Testbed for Encounter Networks

EAI International Conference on Mobile and Ubiquitous Systems 2015

Rodrigo Bruno, Nuno Santos, Paulo Ferreira

WORKSHOP PAPERS:

Imaginary Machines: A Serverless Model for Cloud Applications

Workshop on SErverless Systems, Applications and MEthodologies (SESAME) 2024

Michael Wawrzoniak, Rodrigo Bruno, Ana Klimovic, Gustavo Alonso

Pay-as-you-Go Resource Isolation

Workshop on SErverless Systems, Applications and MEthodologies (SESAME) 2024

Miguel Loureno, Marios Kogias, Rodrigo Bruno

Evicting for the greater good: The Case for Reactive Checkpointing in serverless computing

Workshop On Resource Disaggregation and Serverless Computing (WORDS) 2023

Rafael Alexandre, Rodrigo Bruno, Joo Barreto, Rodrigo Rodrigues

Ephemeral Per-query Engines for Serverless Analytics

Workshop on Serverless Data Analytics (SDA) 2023

Michael Wawrzoniak, Rodrigo Bruno, Ana Klimovic, Gustavo Alonso

Bridging language- and hardware-based isolation for scalable and secure serverless runtimes

Workshop on SErverless Systems, Applications and MEthodologies (SESAME) 2023

Rodrigo Cidra, Rodrigo Bruno, Pedro Fonseca

From Warm to Hot Starts: Leveraging Runtimes for the Serverless Era

Workshop on Hot Topics in Operating Systems (HotOS) 2021

Joao Carreira, Sumer Kohli, Rodrigo Bruno, Pedro Fonseca

Hermes: Enabling efficient large-scale simulation in MATSim

ABMTRANS 2021

Dan Graur, Rodrigo Bruno, Joschka Bischoff, Marcel Rieser, Wolfgang Scherr, Torsten Hoefler, Gustavo Alonso

Serverless Clusters: The Missing Piece for Interactive Batch Applications?

Systems for Post-Moore Architectures (SPMA) 2020

Ingo Mueller, Rodrigo Bruno, Ana Klimovic, John Wilkes, Eric Sedlar, Gustavo Alonso

Towards High Performance Mobility Simulations

Swiss Transport Research Conference (STRC) 2019

Rodrigo Bruno, Michel Mueller, Gustavo Alonso, Torsten Hoefler

Improving JVM Application Migration and Profiling with Checkpoint/Restore

Checkpoint-Restore Microconference 2017

Rodrigo Bruno, Paulo Ferreira,

NG2C: Pretenuring Garbage Collection with Dynamic Generations for HotSpot Big Data Applications

International Workshop on Cloud Data and Platforms (CloudDP) 2016

Rodrigo Bruno, Paulo Ferreira

SCADAMAR: scalable and data-efficient internet MapReduce

CrossCloud Brokers (CCB) 2014

Rodrigo Bruno, Paulo Ferreira

freeCycles: efficient data distribution for volunteer computing

International Workshop on Cloud Data and Platforms (CloudDP) 2014

Rodrigo Bruno, Paulo Ferreira

JOURNAL PAPERS:

BestGC: An Automatic GC Selector

IEEE Access, 2023

Sanaz Tavakolisomah, Rodrigo Bruno, Paulo Ferreira

A study on Garbage Collection Algorithms for Big Data Environments

ACM Computing Surveys, 2017

Rodrigo Bruno, Paulo Ferreira

freeCycles - Efficient Multi-Cloud Computing Platform

Springer Journal of Grid Computing, 2017

Rodrigo Bruno, Paulo Ferreira

THESES:

novaVM: Enhanced Java Virtual Machine for Big Data Applications

PhD Thesis

Advised by Prof. Paulo Ferreira

freeCycles: Efficient Data Distribution for Volunteer Computing

MSc Thesis

Advised by Prof. Paulo Ferreira

INVITED TALKS

Language Runtimes for Scalable, Elastic, and Heterogeneous Cloud Applications in Huawei Memory Technologies Summit 2024, June 2024

WEE: a WebAssembly Execution Environment for Elastic, Scalable, and Efficient Cloud Applications in the ETH Zurich, June 2024

Language Runtimes for the new Cloud Era in the University of Oslo, May 2024

Language Runtimes for the new Cloud Era in Dynamic Languages Symposium (DLS'23) 2023

Slashing the Virtualization Tax in Serverless Clouds in the University of Edinburgh, June 2023

Scalable and Secure Serverless Runtimes in Second International Workshop on Serverless Computing Experience (WOSCx2) 2023

TEACHING

Management and Administration of It Infrastructures and Services

DEI, Instituto Superior Técnico, University of Lisbon

Fall 2022, Fall 2023

Computer Systems Engineering

DEI, Instituto Superior Técnico, University of Lisbon

Fall 2021, Fall 2022, Fall 2023

Cloud Computing and Virtualization

DEI, Instituto Superior Técnico, University of Lisbon

Spring 2021, Spring 2022

Big Data for Engineers - Head Teaching Assistant

D-INFK, ETH Zurich

Spring 2020

Advanced Systems Labs - Teaching Assistant

D-INFK, ETH Zurich

Fall 2019

Mobile Computing - Teaching Assistant

DEI, Instituto Superior Técnico, University of Lisbon

Spring 2016, Spring 2017, Spring 2018

Mobile Computing - Teaching Assistant

SISE, INESC-ID Lisbon

Fall 2015, Fall 2016

Advanced Programming - Teaching Assistant

DEI, Instituto Superior Técnico, University of Lisbon

Spring 2015

Operating Systems - Teaching Assistant

DEI, Instituto Superior Técnico, University of Lisbon

Fall 2014, Fall 2016

Software Engineering - Teaching Assistant

DEI, Instituto Superior Técnico, University of Lisbon

Fall 2014

SERVICE

PROGRAM COMMITTEE:

2025: ASPLOS'25

2024: ASPLOS'24, EuroSys'24 (Fall PC), NSDI'24, ISMM'24, ATC'24, EuroDW'24, MoreVMs'24

2023: ASPLOS'23, SoCC'23, VMIL'23, WORDS'23, SESAME'23,

2022: OSDI'22, NSDI'22 (ERC) MoreVMs'22

2021: Middleware'21 (ERC)

ORGANIZING COMMITTEE:

SESAME'24, SESAME'23, MPLR'23, MoreVMs'22, SINFO XIX

JOURNAL REVIEWER:

Journal of Science Computer Programming (2019), Journal of Grid Computing (2019)

OTHER:

SOSP'21 Artifact Evaluation Committee, EuroSys'20 Shadow Program Committee

MENTORING

António Elias Topic: Serverless Machine Learning MSc in Instituto Superior Técnico, University of Lisbon	2022 - 2023
Serhii Ivanenko Topic: Serverless Persistent Resources MSc in Instituto Superior Técnico, University of Lisbon	2022 - 2023
Diogo Santos Topic: Multi-step Function-as-a-Service Application Optimizer MSc in Instituto Superior Técnico, University of Lisbon	2022 - 2023
Jorge Godinho Topic: Java Network Virtualization MSc in Instituto Superior Técnico, University of Lisbon	2022 - 2023
Roman Babynyuk Topic: Thin Serverless Functions with GraalVM Native Image MSc in Instituto Superior Técnico, University of Lisbon	2021 - 2023
Filipe Sousa (co-advised with Luís Veiga) Topic: Performance Isolation of Colocated Serverless Functions MSc in Instituto Superior Técnico, University of Lisbon	2021 - 2022
David Nunes (co-advised with Luís Veiga) Topic: Cgroup Caching @ GraalVM MSc in Instituto Superior Técnico, University of Lisbon	2020 - 2023
David Frickert (co-advised with Luís Veiga) Topic: Photons@Graal - Enabling Efficient Function-as-a-Service on GraalVM MSc in Instituto Superior Técnico, University of Lisbon	2020 - 2022
Sanaz Tavakoli (co-advised with Paulo Ferreira) Topic: Garbage Collection for Modern JVMs PhD in University of Oslo	2020 - 2024

Domantas Lionas (co-advised with Paulo Ferreira) Topic: Garbage Collection for the Graal Virtual Machine MSc in University of Oslo	2020 - 2021
Sutao Wang (co-advised with Ingo Mueller and Gustavo Alonso) Topic: Fine-grain isolation of Servcerless Functions MSc in ETH Zurich	2020 - 2021
Fernando Moreira (co-advised with Paulo Ferreira) Topic: Supporting Encounter Based Apps MSc in Instituto Superior Técnico, University of Lisbon	2019 - 2020
Carlos Oliveira (co-advised with Paulo Ferreira) Topic: A Performance Comparison of Modern Garbage Collectors for Big Data Environments MSc in Instituto Superior Técnico, University of Lisbon	2018 - 2020

AWARDS & HONOURS

Awarded the "excellence" recognition for teaching Management and Administration of It Infrastructures and Services (Fall 2022);

Awarded "Best Young Researcher 2022" by INESC-ID Lisbon;

Awarded the "excellence" recognition for teaching Cloud Computing and Virtualization (Spring 2022);

PhD thesis awarded with "Pass with Distinction and Honour";

Awarded the "excellence" recognition for teaching Mobile Computing (Spring 2018);

Awarded 2nd place in the Fraunhofer Portugal Challenge 2018 in the PhD category;

Awarded the Doctoral Student Merit Award 2017 by the Distributed Systems Group, INESC-ID Lisboa;

Awarded the "excellence" recognition for teaching Operating Systems (Fall 2016);

Awarded the "excellence" recognition for teaching Operating Systems (Fall 2014);

PhD Research Scholarship (Fundação para a Ciência e Tecnologia);

Merit Award from EJEJA, given to the top three students finishing high school.