

Adrian Palacios

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WORK EXPERIENCE

Amazon Web Services

Aug. 2024 – Present

Applied Scientist

Arlington, VA

- Contributed to Cedar, an open-source policy language and authorization engine.
 - Formalized the datetime extension through mathematical proofs in Lean, enabling feature stabilization.
 - Established benchmarking infrastructure and drove performance optimizations across parsing and CST-to-AST conversion.
- Designed and implemented reliability features for a production automated reasoning service.
 - Built a load testing framework validating scalability to production requirements.
 - Delivered idempotency, request deduplication, and automated API security testing for a successful security review and multi-region launch.
- Launched and developed IAM Policy Autopilot, an open-source static analysis tool to generate baseline IAM policies from application code.
 - Designed an extensible framework for third-party library model support, enabling detection of AWS permissions through external libraries.
 - Built a generic async LSP client for Python type extraction, enabling more precise resolution of SDK service calls.

Amazon Web Services

Oct. 2020 – Aug. 2024

Applied Scientist

Boston, MA

- Launched and developed the Kani Rust Verifier, an open-source automated reasoning tool based on model checking for the verification of Rust programs.
 - Led various User Experience (UX) projects to make Kani more accessible and boost its adoption.
 - Contributed to the modeling, implementation and testing of over 200 Rust intrinsics in Kani.
 - Designed and implemented a new coverage feature based on LLVM source-based code coverage.

Amazon Web Services

Apr. 2019 – Jul. 2019

Software Development Engineer Intern

Boston, MA

- Developed machine-checked memory safety proofs using the C Bounded Model Checker (CBMC) for the real-time operating system FreeRTOS.
- Demonstrated memory safety of the Dynamic Host Configuration Protocol (DHCP) in the FreeRTOS kernel.
- Demonstrated memory safety of the 15 most-used functions in the Task Pool library in the FreeRTOS kernel.

Technical University of Valencia (Universitat Politècnica de València)

Apr. 2015 – Mar. 2019

Researcher

Valencia, SPAIN

- Conducted research on innovative techniques for testing and debugging programs in Erlang, a concurrent, functional programming language based on the actor model.
- Developed a causal-consistent replay debugger for Erlang that enables reversible debugging in concurrent programs using their traces, along with complementary tools for logging program traces.
- Developed a dynamic symbolic execution tool for Erlang programs.

National Research Council (Consiglio Nazionale delle Ricerche)

Sep. 2017 – Dec. 2017

Visiting Researcher

Rome, ITALY

- Conducted research on Constraint Logic Programming (CLP) and Property-Based Testing (PBT) under the supervision of Prof. Maurizio Proietti.

- Developed a tool implementing an efficient approach for automated test case generation using CLP techniques in a popular PBT framework for the functional programming language Erlang.

Nagoya University

Visiting Researcher

Sep. 2016 – Dec. 2016

Nagoya, JAPAN

- Conducted research on Term Rewriting Systems (TRS) and Reversible Computation (RC) under the supervision of Prof. Naoki Nishida.
- Developed and implemented a reversibilization procedure applicable to a broad class of TRS.

EDUCATION

Technical University of Valencia (Universitat Politècnica de València)

PhD in Computer Science

SPAIN

Feb. 2020

Valencia,

- Thesis: Formal Methods for Constraint-Based Testing and Reversible Debugging in Erlang.
- Advisor: Prof. German Vidal - Honors: Cum Laude.

Technical University of Valencia (Universitat Politècnica de València)

MSc in Artificial Intelligence, Pattern Recognition and Digital Imaging

SPAIN

Sep. 2014

Valencia,

Technical University of Valencia (Universitat Politècnica de València)

BE in Computer Science

Sep. 2012

Valencia, SPAIN

PUBLICATIONS

- I. Lanese, **A. Palacios**, G. Vidal. Causal-Consistent Replay Reversible Semantics for Message Passing Concurrent Programs. In *Fundamenta Informaticae* 2021.
- E. De Angelis, F. Fioravanti, **A. Palacios**, A. Pettorossi, M. Proietti. Property-Based Test Case Generators for Free. In *Proceedings of TAP 2019*.
- I. Lanese, **A. Palacios**, G. Vidal. Causal-Consistent Replay Debugging for Message Passing Programs. In *Proceedings of FORTE 2019*.
- E. De Angelis, F. Fioravanti, **A. Palacios**, A. Pettorossi, M. Proietti. Bounded Symbolic Execution for Runtime Error Detection of Erlang Programs. In *Proceedings of HCVS 2018*.
- F. J. Zamora-Martínez, S. España-Boquera, M. J. Castro-Bleda, **A. Palacios-Corella**. Fallback Variable History NNLMs: Efficient NNLMs by precomputation and stochastic training. In *PLoS One* 2018.
- I. Lanese, N. Nishida, **A. Palacios**, G. Vidal. A Theory of Reversibility for Erlang. In *Journal of Logical and Algebraic Methods in Programming* 2018.
- I. Lanese, N. Nishida, **A. Palacios**, G. Vidal. CauDER: A Causal-Consistent Reversible Debugger for Erlang. In *Proceedings of FLOPS 2018*.
- N. Nishida, **A. Palacios**, G. Vidal. Reversible Computation in Term Rewriting. In *Journal of Logical and Algebraic Methods in Programming* 2018.
- N. Nishida, **A. Palacios**, G. Vidal. A Reversible Semantics for Erlang. In *Proceedings of LOPSTR 2016*.
- N. Nishida, **A. Palacios**, G. Vidal. Reversible Term Rewriting. In *Proceedings of FSCD 2016*.
- **A. Palacios**, G. Vidal. Concolic Execution in Functional Programming by Program Instrumentation. In *Proceedings of LOPSTR 2015*.
- **A. Palacios**, G. Vidal. Towards Modelling Actor-Based Concurrency in Term Rewriting. In *Proceedings of WPTE 2015*.

PRESENTATIONS AND POSTERS

- Bounded Symbolic Execution for Runtime Error Detection of Erlang Programs. Talk at HCVS 2018 in Oxford,

United Kingdom.

- CauDEr: A Causal-Consistent Reversible Debugger for Erlang. Talk at FLOPS 2018 in Nagoya, Japan.
- Safe Sessions for Erlang. Talk & poster at PLDI 2017 Student Research Competition in Barcelona, Spain.
- A Reversible Semantics for Erlang. Talk at LOPSTR 2016 in Edinburgh, United Kingdom.
- Reversible Term Rewriting. Talk at FSCD 2016 in Porto, Portugal.
- Concolic Execution in Functional Programming by Program Instrumentation. Talk at LOPSTR 2015 in Sienna, Italy.
- Modelling Actor-Based Concurrency in Term Rewriting. Talk at WPTE 2015 in Warsaw, Poland.

SERVICE

- Artifact Evaluation Committee Member for PLDI 2021, PLDI 2022, ECOOP 2023, ISSTA 2024, ISSTA 2025
- Program Committee Member for LPAR 2020
- Reviewer for the Journal of Engineering Applications of Artificial Intelligence (2020)
- Reviewer for the conferences ICLP 2018, FSCD 2020, ECOOP 2023

SKILLS

- Languages: Rust, C/C++, Python, Erlang, Java, Prolog.