Benjamin Mariano

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Education

University of Texas at Austin **Sep. 2019 – Dec. 2024**
PhD, Department of Computer Science with advisor Işil Dillig *Austin, Texas*

University of Maryland, College Park **Sep. 2017 – May 2019**
M.Sc., Department of Computer Science with advisor Jeff Foster *College Park, Maryland*

University of Maryland, College Park **Sep. 2013 – May 2017**
B.Sc., Department of Computer and Electrical Engineering *College Park, Maryland*

Research Experience

University of Texas at Austin **Sep. 2019 – Dec. 2024**
Research Assistant with Işil Dillig *Austin, Texas*

- Designed system for automatically deobfuscating software using program synthesis
- Created neural-guided program synthesizer for automatically translating functional code to imperative code
- Performed large-scale study of common loop semantics summaries in smart contracts
- Helped design type system for detecting overflow vulnerabilities in smart contracts
- Worked on tool for automatically translating Apache Spark RDD programs to SQL
- Helped create SmartLTL, a tool for automatically verifying liveness properties in smart contracts

Max Planck Institute **May. 2019 – Sep. 2019**
Research Intern with Maria Christakis *Kaiserslautern, Germany*

- Designed optimization methodology for balancing precision and scalability in abstract interpretation
- Performed empirical study on real-world programs to measure precision/performance tradeoffs

University of Maryland, College Park **Sep. 2017 – May 2019**
Research Assistant with Jeff Foster *College Park, Maryland*

- Developed and tested new models of the Java Standard Library for synthesis optimization
- Experimented with new axiomatic programming paradigms for program synthesis

Industry Experience

Veridise **May 2022 – Present**
Vice President of Research and Development *Austin, Texas*

- Leading fuzzing team aimed at developing automated testing software for DeFi applications
- Acting as project lead on multiple audits of client smart contract and blockchain code
- Overseeing design and development of Chainsaw, a coverage-guided fuzzer for blockchain protocols which has found over a dozen critical bugs in production-level software to date.
- Serving as project lead for OrCa, an oracle-guided fuzzer for testing smart contracts against user-provided logical specifications.

Intel **Oct. 2021 – May 2022**
Research Engineer with Justin Gottschlich *Austin, Texas*

- Worked in the Machine Programming team developing automated techniques for learning syntax-driven code translators
- Designed technique using enumerative program synthesis for discovering succinct code translation rules

Prime Solutions **Summer 2015, Summer 2016**
Software Engineering Intern *Columbia, Maryland*

- Designed, developed, and tested simulation of malicious protocols in C and Python
- Automated analysis of local WiFi traffic to determine device-specific information

Teaching Experience

University of Texas at Austin **Jan. 2022 – May 2022**
Teaching Assistant for Automated Logic and Reasoning with Işil Dillig *Austin, Texas*

University of Texas at Austin **Sep. 2019 – Dec. 2019**
Teaching Assistant for Discrete Math with Işil Dillig *Austin, Texas*

University of Maryland, College Park **Jan. 2018 – May 2018**
Co-teacher for Functional Pearls with Cameron Moy *College Park, Maryland*

University of Maryland, College Park **Sep. 2017 – Dec. 2017**
Teaching Assistant for Advanced Functional Programming with Niki Vazou *College Park, Maryland*

Awards and Service

PLDI 2022 Artifact Evaluation Committee **2022**
POPL 2019 PLMW Travel Scholarship **2019**
University of Maryland Honor's College Member **2013-2017**
University of Maryland Dean's Scholarship **2013-2017**
University of Maryland Dean's List **2013-2017**

Publications

Control-Flow Deobfuscation using Trace-Informed Compositional Program Synthesis. Benjamin Mariano, Ziteng Wang, Shankara Pailoor, Christian Collberg, Işil Dillig **OOPSLA 2024**

Automated Translation of Functional Big Data Queries to SQL. Guoqiang Zhang, Benjamin Mariano, Xipeng Shen, Işil Dillig **OOPSLA 2023**

Automated Transpilation of Imperative to Functional Code Using Neural-Guided Program Synthesis. Benjamin Mariano, Yanju Chen, Yu Feng, Shuvendu K. Lahiri, Işil Dillig **OOPSLA 2022**

SolType: Refinement Types for Arithmetic Overflow in Solidity. Bryan Tan, Benjamin Mariano, Shuvendu K. Lahiri, Işil Dillig, Yu Feng **POPL 2022**

Automatically Tailoring Abstract Interpretation to Custom Usage Scenarios. Muhammad Numair Mansur, Benjamin Mariano, Maria Christakis, Jorge A. Navas, Valentin Wüstholz **CAV 2021**

SmartPulse: Automated Checking of Temporal Properties in Smart Contracts. Jon Stephens, Kostas Ferles, Benjamin Mariano, Shuvendu K. Lahiri, Işil Dillig **S&P 2021**

Demystifying Loops in Smart Contracts. Benjamin Mariano, Yanju Chen, Yu Feng, Shuvendu K. Lahiri, Işil Dillig **ASE 2020**

Program Synthesis with Algebraic Library Specifications. Benjamin Mariano, Josh Reese, Siyuan Xu, ThanhVu Nguyen, Xiaokang Qiu, Jeffrey S. Foster, Armando Solar-Lezama **OOPSLA 2019**