

Work Experience

- Mar 2023– **Senior Researcher** | *Oracle Labs* | Zurich, Switzerland (Remote)
- Leading development of a project to automatically generate optimizing bytecode interpreters from Truffle AST node specifications, thereby reducing warm-up overhead of existing AST interpreters.
- May–Aug 2021 **Research Intern** | *Oracle Labs* | Zurich, Switzerland (Remote)
- Designed an on-stack replacement (OSR) API for Truffle bytecode interpreters
 - Integrated OSR API with Truffle's LLVM and JVM bytecode interpreters, reducing cold-start benchmark times by as much as 35× and 20× respectively
- Jun–Aug 2020 **Software Engineering Intern** | *Facebook* | Seattle, Washington (Remote)
- Developed a best-effort translator between Presto and Spark SQL to facilitate pipeline migration
 - Fully translated over 3000 memory-intensive Presto pipelines to Spark
- Sep–Dec 2019 **Software Engineering Intern** | *Facebook* | New York City, New York
- Designed a Python API for programmatically decoding and inspecting Android DEX files
 - Built a utility to generate semantic and structural diffs between Android APK files
 - Profiled and optimized diffing utility, reducing execution time by 90×
- Jan–Apr 2019 **Software Engineering Intern** | *Facebook* | Menlo Park, California
- Built a more reliable and robust VSCode extension for Pyre, Facebook's Python typechecker
 - Reduced Pyre's startup time by as much as 8× using a more efficient build process
- May–Aug 2018 **Software Engineering Intern** | *Snowflake Computing* | San Mateo, California
- Implemented compiler and client support for multi-statement query execution
 - Optimized SQL client's handling of array binds to protect the database from degraded performance

Education

- 2020–2023 **Master of Mathematics (Computer Science)** | *University of Waterloo*
- Thesis: Efficient Implementation of Parametric Polymorphism using Reified Types
- 2015–2020 **Bachelor of Software Engineering** | *University of Waterloo*
- Undergraduate Research Assistant (2019): Using static analysis to optimize TrueType font bytecode
 - Undergraduate Research Assistant (2016): Bazel and Java 9 integration for the Checker Framework

Publications

Matt D'Souza, James You, Ondřej Lhoták, and Aleksandar Prokopec. TASTyTruffle: Just-in-time Specialization of Parametric Polymorphism. *OOPSLA*, 2023 (to appear).

Matt D'Souza and Gilles Duboscq. Lightweight on-stack replacement in languages with unstructured loops. In *Proceedings of the 13th ACM SIGPLAN International Workshop on Virtual Machines and Intermediate Languages*, pages 4–13, 2021.

Interests

- Court & beach volleyball, long-distance running
- Acoustic guitar, keyboard
- Crosswords