Tomaz Gomes Mascarenhas

25 years old
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Education

Oct 2021 - Current | **MSc. in Computer Science (Formal Methods)**, *Universidade Federal de Minas Gerais*, Brazil
Develops a tool that aims to connect the SMT solver cvc5 with the Lean proof assistant. The goal is to, given a theorem to be proven in Lean, convert it into a SMT query, use it as input to cvc5, and reconstruct the proof given by the solver inside the proof assistant, so that it is accepted as a native proof in Lean.
Thesis: Proving Lean theorems via reconstructed SMT proofs **Advisor**: Haniel Barbosa

Ago 2016 - Mar 2021 | **BSc. in Computer Science and Mathematics**, *Universidade Federal de Minas Gerais*, Brazil
GPA: 86/100 **Thesis**: Formalization of Time Complexity of Sorting Algorithms using Lean

Industry Experiences

Apr 2021 - Sep 2021 | **Full Time Position**, *Imagine A.I.*, Compilers and Blockchain Researcher
Implementing smart contracts in Plutus
Key Achievements:
- Researched and implemented the first techniques for parallelizing transactions in Plutus
- Successfully built a smart contract (both On-Chain and Off-Chain code) for a client of the company

Competences: Haskell, Plutus, eUTxO model, Blockchain

Dec 2020 - Mar 2021 | **Internship**, *Imagine A.I.*, Compilers Researcher
Developing a compiler that could generate entire Node/Django projects from simple configuration files.
Key Achievements:
- Extended the compiler by implementing code generation for new frameworks
- Implemented a set of automated, randomized and sandboxed tests for the compiler
- Produced a blog post with part of the results: https://www.imagine.ai/blog/imagine-compiler-testing

Competences: Haskell, Compilers, DSLs, Tests, Hedgehog, Web frameworks

Academic Experiences

Aug 2022 | **Organization Team**, Federated Logic Conference (FLoC) 2022

Aug 2018 - May 2020 | **Undergraduate Research**, *UFMG*, Proof Assistants and Type Theory
Read, discussed and solved the exercises from the books Types and Programming Languages and Programming Language Foundations in Agda with the advisor. Formalized and verified properties of sorting algorithms and Lambda Calculus using Agda.

Awards

Apr 2022 | **Silver Medal (8th place)**, *ACM ICPC - Brazilian Finals*

May 2019 | **Silver Medal (5th place)**, *VIII Maratona Mineira de Programação*

Personal Projects

Haskell, Agda | **Lam**, Formally verified interpreter for lambda calculus. The main motivation is to study the implementation and formal semantics of features like polymorphism, type classes and dependent types. Source code: https://github.com/tomaz1502/lam

Rust | **Functional Text Editor**, Terminal-based text editor focused on functional programming languages (work in progress, early stages). Source code: https://github.com/tomaz1502/FunctionalEditor

Language Fluency

Native | Portuguese

Professional | English (IELTS C1)

Links

Github | https://github.com/tomaz1502

Linkedin | https://www.linkedin.com/in/tomaz-gomes/