Tesla Zhang

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Education

The Pennsylvania State University, PA, US 08/2018 – Present

Major: Computer Science (Undergraduate), Anticipated Date of Graduation: 01/2023 GPA 3.23/4.00

Work Experience

JetBrains Research, Remote 01/2020 – 12/2020

(HoTT and Dependent Types) Arend Team Intern

- Improved the language/IDE, such as sections, hygiene macros, optimized `Fin` type, semantic highlighting, etc.
- Created a debugger for inspecting bidirectional type-checking and REPL in both CLI and IDE.

PLCT Lab, Remote 12/2020 – Present

(Implementation of Dependent Types) Types team lead

- Leading the types team to explore modern techniques in dependent type implementation, such as pattern unification of implicit variables, type checking of pattern matching, termination check of recursive definitions, etc.

PingCAP Inc., Remote 08/2018 – 08/2019

(Distributed Storage Systems) TiKV Intern - Ecosystem Team

- Improved many TiKV-relevant libraries, like optimizing the performance of grpcio, adding new features to procinfo.

Sourcebrella Inc. (now Ant Financial Code Insight), Shenzhen, China 02/2018 – 07/2018

(Static Analysis) Developer Intern

Personal Projects

Aya https://github.com/aya-prover/aya-dev

Practical implementation of a dependent type system (role: project leader)

- Supports dependent types, dependent pattern matching with confluence check for overlapping cases, higher inductive types, GADTs, and implicit arguments.
- Supports visualization of the type checking traces and exporting elaboration result to HTML or LaTeX.

IntelliJ Pest https://github.com/pest-parser/intellij-pest

A Pest grammar language plugin for IDEs based on the IntelliJ Platform

- Semantic-based highlighting, completion, navigation, definition extraction/inlining, and Rust plugin integration.
- Provides live preview – test grammar files by dynamically highlighting user code according to the grammar on the fly. These highlighted code could be exported to HTML.

Skills

- **Program Language**: **multilingual** (not limited to any specific language), especially experienced in Java Kotlin Rust C# Agda Haskell Arend, comfortable with Dart C C++ F# F⋆ Idris Perl (in random order).
- **Compiler**: understand various program representations such as CFG, ANF, (P)HOAS, etc.
- **Kotlin/Java**: **4 years** of experience, familiar with JNI, Gradle, and Swing, understand Contract DSL and Kotlin coroutines, did some code analysis with Kotlin's compiler.
- **Type Theory**: understand Martin-Löf type theory, coinduction, Homotopy type theory and Cubical type theory, familiar with Idris, Agda (**3 years** of experience, contributor), Arend (past member) and some F⋆/Coq.
- **IDE Tooling**: **3 years** of experience, familiar with the IntelliJ Platform infrastructure (created Julia, DTLC, Pest, etc.), also have experience with Eclipse/SonarQube/VSCode plugin development.
- **Development Tool**: can adapt to any editors/OSs, usually use JetBrains IDEs and Emacs under Ubuntu.

Miscellaneous

- Some profile links (please use a PDF reader with hyperlink support): Bintray profile (for publishing JVM libraries), Crates.io profile (for publishing Rust libraries), IntelliJ Plugin developer profile, Research Statement
- Languages: English - fluent (TOEFL 100), Chinese - native speaker
- Opensource Contributions: https://ice1000.org/opensource-contributions contributed to agda, Arend, KaTeX, shields.io, grpc-rs, intellij-solidity, intellij-haskell, intellij-rust, TeXiFy-IDEA, rust-analyzer and other projects
- StackOverflow: https://tinyurl.com/y5cmw3dz 5000+ reputations, also active on other StackExchange sites
- Latest one-page version of this resume: https://tinyurl.com/y8xdlfug
- Latest complete version of this resume: https://tinyurl.com/y2v59t36
- **1 dan** on CodeWars, ranked #59 on the whole site (Top 0.021%), primarily in Haskell, Agda and Idris