

TESLA ICE ZHANG

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EDUCATION

The Pennsylvania State University, PA, US 08/2018 – Present
Major: Computer Science (Undergraduate), Anticipated Graduation Date: 06/2022, GPA 3.22/4.00

WORK EXPERIENCE

JetBrains Research, Remote 01/2020 – Present
(HoTT and Dependent Types) Theorem Prover Arend development Intern

- Used features like gradle composite build and buildSrc to reduce build time and improve automation.
- Designed and implemented syntax sugars and IDE features, such as the `___` syntax, subexpr visitor, etc.
- Created an extensible REPL framework, provided implementations in CLI (with context-based completion) and in IDE (interacts with the modules loaded in the opened project).

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.
- Helped to migrate the Protocol-Buffer library used by TiKV and its Raft implementation.
- Learned a lot about Rust programming, distributed system, working remotely, and databases.

Sourcebrella Inc., Shenzhen, China 02/2018 – 07/2018
(Static Analysis) Compiler Front-End, IDE Plugin Dev Intern

- Created IntelliJ/CLion/Eclipse plugin for the Pinpoint analyzer. Co-worked on the SonarQube plugin.
- Created a multi-threading cross Java/Kotlin source code indexer which can index Hadoop within 4 minutes.
- Learned a lot about Linux programming and the Clang/LLVM codebase.

PERSONAL PROJECTS

DevKt <https://github.com/ice1000/dev-kt>
Cross-platform lightweight code editor / Kotlin IDE

- Built-in Java/Kotlin highlights and completion, that can support other languages via plugins (transplantable from JetBrains IDE's). Has extra build & run support for Kotlin.
- Flexible architecture, decoupled high-level logic with UI, migration to other UI frameworks is easy.
- Provides fine-grained highlight color and keymap settings, supports hot reload.

Voile <https://github.com/owo-lang/voile-rs>
Experimental dependently-typed language with kind-based row-polymorphism

- Supports dependent types, meta variable unification, and non-dependent row-polymorphic record and variant.
- Supports cumulative universe levels and uses a universe lifting operation to get rid of $\text{Set}\omega$.
- Implements CLI parser/source code parser and interactive REPL with the help of Rust language's ecosystem.

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.
- Supports exporting the highlighted user code to HTML format.

External Tactics for Agda <https://github.com/ice1000/agda-mode>
A REPL interacts with Agda CLI interface, simulating Ltac in Coq

- Implements IO via tokio and serde along with the json interface in Agda compiler.
- Supports most actions available in the Emacs mode, like case-split, show expression and goal type, etc.

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 Control Flow Graphs and A-Normal Form. Familiar with most parser generators, understand layout syntax parsing.
- **Kotlin/Java: 4 years** of experience, 4 projects collected in Awesome Kotlin, familiar with JNI, Gradle, and Swing, understand Contract DSL and Kotlin coroutines, did some code analysis with Kotlin's compiler.

- **Type System:** understand Martin-Löf Type Theory, coinduction and Cubical Type Theory, currently studying Homotopy Type Theory, familiar with Idris, Agda (**2 years** of experience, contributor), F★, Arend and some Coq.
Source code studied: Agda, Idris, MiniAgda, Mini-TT, elaboration-zoo and Arend.
- **JetBrains MPS:** understand concepts and applications of **Language-Oriented Programming**.
- **IDE Tooling:** **3 years** of experience, familiar with the IntelliJ Platform infrastructure (created Julia, DTLC, Pest and many other plugins), also have experience with Eclipse/SonarQube plugin development.
- **Mobile Development:** **2 years** of experience, Android (Java, Kotlin (Anko)), Fuchsia (Flutter)
- **Development Tool:** can adapt to any editors/OSs, usually use JetBrains IDEs and Emacs under Ubuntu, have experience with team collaboration tools like YouTrack, Jira, GitHub, BitBucket, Coding.net, Tower, Slack, JetBrains Space.

MISCELLANEOUS

- Bintray profile: <https://bintray.com/ice1000>, for publishing useful JVM libraries
- Crates.io profile: <https://crates.io/users/ice1000>, for publishing interesting Rust libraries
- IntelliJ Plugin developer profile: <https://plugins.jetbrains.com/author/10a216dd-c558-4aaf-aa8a-723f431452fb>
- Research profile: <https://personal.psu.edu/yqz5714>
- Languages: English - fluent (TOEFL 100), Chinese - native speaker
- Opensource Contributions: <https://ice1000.org/opensource-contributions>
member of JuliaEditorSupport, agda, pest-parser, EmmyLua, arend-lang and more, contributed to agda, Arend, KaTeX, shields.io, raft-rs, grpc-rs, intellij-solidity, intellij-haskell, intellij-rust, intellij-arend, TeXiFy-IDEA, rust-analyzer and other projects (apart from organization ones)
- StackOverflow: <https://tinyurl.com/y5cmw3dz> 4500+ reputations, also active on other StackExchange sites
- Get the latest version of this resume: <https://tinyurl.com/y2v59t36>
- Get the Chinese version of this resume: <https://tinyurl.com/ya4urea8>
- Get the simplified version of this resume: <https://tinyurl.com/y8xdlfug>
- **1 dan** on CodeWars, ranked #42 on the whole site (Top 0.020%), solving and making new problems primarily in Haskell, Agda and Idris
- Love making friends