

# RUSTIN LIU

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## 🎓 EDUCATION

### Software Engineering Bachelor's Degree

Sep 2015 – June 2019

- Chongqing University of Technology

## ⚙️ SKILLS

- **Programming Languages:** Experienced in Go/Rust/JavaScript, **multilingual** (can adapt to any language)
- **Development Tools:** familiar with Linux-based programming, have experience with tools like Git, GitHub, Docker, Jenkins, Github Actions and Jira, etc.
- **Languages:** **English** (Can read, write and speak fluently), **Chinese** (Native speaker)

## 👤 WORK EXPERIENCE

### PingCAP Inc. - Database - Database Kernel R&D(Golang/Rust) August 2023 – Present

*Transferred from the data platform department to the kernel computing department and started to focus on the development of the optimizer of the distributed database TiDB.*

#### Responsibilities:

- Designed, implemented and maintained the optimizer of the distributed database TiDB.

#### Accomplishments:

- Optimized the update of statistics for millions of tables, reducing the update duration from 1.5 hours to about 10 seconds.
- Optimized statistics collection by implementing an in-memory priority queue, eliminating repeated queue rebuilding overhead, reducing CPU usage by one core and memory consumption by 99%.
- Designed and implemented the predicate columns feature to optimize statistics collection by only analyzing columns used in predicates, reducing auto analyze time by 50% in OLTP workloads and nearly 99% in partitioned wide table scenarios.
- Designed and implemented the priority queue for speed up the auto analyze process, significantly reducing the starvations of the auto analyze process.
- Added support for the LOCK STATS TABLE feature to allow users to lock statistics updates and generate stable execution plans.

### PingCAP Inc. - Database - Database Tools R&D(Golang/Rust) July 2021 – July 2023

*Transferred from the community department to the data platform department and started to focus on the development of data synchronization tools TiCDC.*

#### Responsibilities:

- Designed, implemented, and maintained core modules, focusing on Sink and Sorter, and managed daily project maintenance including issue tracking, code reviews, and on-call customer support.

#### Accomplishments:

- Changed push mode to pull mode to optimize memory management and data synchronization process, greatly improving OOM issues and synchronization lags.
- Modified the Sink module from synchronous to asynchronous mode to optimize code performance and improve throughput by 30% in incremental scenarios.
- Added multi-topic and OAuth authorization support for Kafka Sink, greatly reducing the operation and maintenance costs of multi-topic tasks.
- Added the ability to optimize the Lossy DDL from full table scan to not synchronizing any data, greatly reducing the impact of DDL on the system.
- Refactored all of TiCDC's CLI code to standardize the way commands are added and written, which greatly improved maintainability.

## PingCAP Inc. - Database - Full-Stack Engineer(Golang/JS)

Aug 2020 – July 2021

*Joined the community department to develop TiChi to support community collaboration based on the Kubernetes Community Prow project.*

### Responsibilities:

- Designed and implemented a project with collaborative robots on GKE using Prow, optimizing community collaboration processes for open source contributors.

### Accomplishments:

- Completed TiChi, which has become the company's CI/CD infrastructure, on time.
- Fixed bugs and added features for Prow, submitted 39 PRs.

## Morningstar, Inc. - Financial Services - Full-Stack Engineer(Java/JS) June 2019 – July 2020

*First job after graduation, responsible for writing and maintaining data presentation components, left after the company decided to start closing its China R&D center.*

### Responsibilities:

- Developed and optimized front and back-end components in Java and Vue, enhancing engineering efficiency and front-end infrastructure.

### Accomplishments:

- Independently developed components that are already online, with good stability and performance.
- Implemented a front-end tracking system that uses HeapIO to track user information, with an extensible interface to seamlessly switch to Google Analytics.
- Wrote automated Jenkins scripts for component and document releases, optimizing the release process from a manual 4-hour process to a fully automated 30-minute process.

## OPEN SOURCE PROJECTS

### Cargo(Rust) - Maintainer

260+ commits

*The Rust package manager. Cargo downloads your Rust package's dependencies, compiles your packages, makes distributable packages.*

- Implemented the 'cargo-info' subcommand to display detailed information about a Rust package.
- Improved various error prompts for Cargo commands and the Rust compiler to make errors to effective and clear.
- Added the `-crate-type` function and added related documentation for Cargo.
- Added support for automatic inheritance of the `[workspace.package]` fields for the `cargo new/init` commands.
- Added new syntax for Cargo build scripts to provide a foundation for future extensions to build scripts.
- Added `'target.'cfg(..).linker'` configuration option to allow users to specify the linker via `'cfg(..)'` conditions.
- Added `OR_PATTERNS_BACK_COMPAT` lint to help users migrate to the new `orpatterns` syntax.
- Made authors field optional in Cargo and `rustdoc`.

### crates.io(Rust/JS) - Maintainer

131+ commits

*The Rust package registry.*

- Helped implement RFC 3052 to allow crates.io to accept packages without author information.
- Added support for renaming packages with underscore prefixes to be published on crates.io.
- Aligned crates.io and Cargo on the naming rules for features and crates.
- Implemented token expiration notifications and one-click token copying to improve user experience.

### Rustup(Rust) - Previous Maintainer

110+ commits

### Ant Design(TypeScript) - Previous Maintainer

20+ commits