# DANIEL TISDALL

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## EXPERIENCE

**DYMENSION** (blockchain L1 rollup launchpad - open source) Spain
*Senior Blockchain Software Engineer* March 2024 - Present

Feature and end-to-end (research to finished product) team lead of small engineering teams (2-5) for several security sensitive features for Rollup launchpad and DeFi platform ($500 million market cap in 2024), including:

- A novel trust-minimized bridge between Dymension L1 (Cosmos SDK, Proof of Stake, Go) and Kaspa (Proof of Work, Rust) DAG network with off-chain components (validators, relayer) in Rust and on-chain components in Go.
- Integration of Hyperlane bridge tech (to Kapa, Ethereum, Base, Solana) with additional novel forwarding functionality (Go), modifications to Solidity contracts and Solana programs (Rust), with off-chain parts in Rust and tooling in Typescript.
- Extensions to IBC bridge protocol (Go) with novel rollback and hard fork functionality required for optimistic rollup faults and version upgrades.
- A TEE-based (trusted execution environment) optimistic rollup fast-finalization scheme using GCP confidential computing ('space').

Additionally, independently contributed numerous patches or smaller features to various parts of the stack including DeFi AMM call and swap, rollup sequencing and mempool, bridge relayers, and L1 rollup sequencer bond management and fraud/dispute/fork.

Tech: Rust (incl. Tokio), Go, Kaspa (+Bitcoin), Cosmos SDK, Solidity, Hyperlane, IBC, Typescript, Solidity, EVM, Ethereum, GCP (Google Cloud Platform), TEE, Python, Solana.

**MUZZ** (social mobile app scaleup (YC) with 13 million global users - closed source) UK
*Backend Software Engineer* Jan 2023 - March 2024

Wrote platform wide shared GRPC services following Google Cloud API Design guide including

- App-wide A/B testing and experiment/flag config service
- One-directional WebSocket notifications system based on Netflix architecture
- Rate limiter
- Custom protoc (protobuf compiler) plugin for code-gen for core data repo builds

Individual contributor and backend authority for user acquisition flows:

- Overhaul of SMS OTP system to include WhatsApp, Twilio, AWS SNS
- Facial recognition banning (AWS Rekognition)
- Refer-a-friend with non-fungible real world prizes (coupon codes)
- User phone contact book blocking of other users
- Dual-vendor user selfie liveness check
- QR code user pairing

Tech: Go, AWS (ECS, Lambda, Dynamo NoSQL, SQS, Kinesis, EventBridge etc), MariaDB SQL, Terraform, Redis, OTel, Prometheus, Grafana, gRPC. All cloud native IaC, cost effective.

**INFORMAL SYSTEMS** (blockchain R&D and consulting - open source) UK
*Research Software Engineer* July 2021 – Jan 2023

Contributed feature work to Replicated Security project for the Cosmos Hub (Cosmos SDK, Proof of Stake, Go) blockchain, in particular the validator key rotation [1,2] component, and random seed testing for the whole project via an ABCI and IBC simulator. Applied formal methods tools based on TLA+ and TLC and Apalache model checkers. Wrote TLA+ specs [example] and models for protocol components. Consulted for Agoric platform and developed models for verification of their Javascript smart contract platform. Gave talks at TLA+ Conf 2021, HackAtom 2022.

Tech: Go, Cosmos SDK, Rust, Tendermint ('Comet') Byzantine Consensus, TLA+, model checkers, Typescript, Python.

## EDUCATION

**UNIVERSITÀ DELLA SVIZZERA ITALIANA** Switzerland
*MSc Software Engineering* Sept 2019 - July 2021
Grade: 94.7% - summa cum laude, merit scholarship (best grade) recipient.
Thesis (100%): Designing Concurrent Trees, Model Checking Concurrent Tree Data Structures with TLA+ *[article,pdf,code]*

Designed, verified, and implemented novel concurrent shared-memory AVL tree data structures in Java: developed a multi-reader-single-writer 'chunked' AVL tree. Gave arguments for deadlock and starvation freedom, following Herlihy. Verified linearizability and quiescent tree balance properties using TLA+ and the TLC model checker. Tested implementation using LinCheck. Model checked algorithm from highly influential paper and discovered invariant violations. Demonstrated the bug in several open source implementations. Used model checker traces and a hand built trace visualisation tool to determine flaws in algorithm design.

Areas: formal verification, databases and data engineering, distributed systems, concurrent data structures.

Tech: Java/JVM (including concurrency), Kotlin, C++ (17), Python, React, Typescript, TLA+, Postgres, Neo4j.

**RIJKSUNIVERSITEIT GRONINGEN (+ Erasmus at TECHNISCHE UNIVERSITÄT MÜNCHEN)** Netherlands
*BSc Mathematics* Sept 2016 - June 2019
Grade: 78%.

Areas: algebra, analysis, numerical mathematics, probability and statistics, geometry. Graduate courses: approximation algorithms, convex optimization, discrete optimization, deep (machine) learning.

Tech: C++ (17), C, Python, Matlab.

**HIGH SCHOOL** UK
A* Maths, A Further Maths. UK Maths Trust Silver Award. Sept 2008 - July 2016

## ADDITIONAL

Algorithm competitions (Codeforces 1600 rating in pre-AI era, using C++ 17), algorithm and data structure problems (Leetcode, CSES). Earned $18,000 in Cosmos SDK HackerOne bug bounties (incl. chain halt). AI tool (e.g. Claude Code) power user. Cycling enthusiast.