

Ata Caner Cetinkaya

London, UK | +44 7391 904514 | atacanercetinkaya@gmail.com
linkedin.com/in/atacanercetinkaya | github.com/Capataina

Open Source Contributions

burn, Rust Deep Learning Framework

Rust

- Implementing the A-FINE no-reference image-quality metric (PR #4894, issue #4312, arXiv 2503.11221) into burn-train with an inlined CLIP ViT backbone, five evaluator heads, PyTorch-weight loader, and reference-output regression tests; 1,864 lines across 10 files, in active review.
- Picked up the fold4d / col2im ONNX operator (issue #4519), the inverse of unfold4d. Around 460 LOC across 11 files; backward decomposes into already-differentiable primitives.
- Picked up the TensorContainer downcast panic in burn-backend (issue #3969 + #2924), backend-mismatch unwrap sites in container.rs; choice between Result-API and Backend-generic-TensorContainer refactor pending maintainer direction.
- Picked up the PytorchStore non-contiguous layer index bug (issue #4716) on the same burn-store surface as PR #4894.

tinygrad, Deep Learning Framework

Python

- Implementing the ONNX LSTM operator (PR #16119) supporting forward, reverse, and bidirectional modes; shared activation helper covering all 11 ONNX RNN activations; regression suite against ONNX Runtime. Rebuilt as a 14-line minimum implementation matching Silero VAD parity after PR #15453 closed on tinygrad's strict line-budget filter; in review.

alloy, Modern Rust Ethereum Library

Rust

- Picked up the JSON-RPC Response deserialisation recursion-limit fix in alloy-json-rpc (issue #1156); roughly a 30-LOC patch routing the user-side unbounded_depth feature through to the buried deserialiser.

Projects

Cernio: Local-First Job Discovery and Curation Engine

Rust, Tokio, Ratatui, SQLite

- Built a local-first job-discovery and curation engine that treats job search as a systems problem, scanning hundreds of companies across the major ATS providers, deduplicating against SQLite, and orchestrating AI agents grading every opportunity against a structured candidate profile on multiple fit dimensions through 9 native Claude Code skills.
- Built an interactive Ratatui terminal dashboard with vim-style search, grade-based sorting, pipeline kanban, multi-select bulk operations, markdown export, responsive layout, and real-time database refresh.

NeuroDrive: Biology-First RL Driving Simulator

Rust, Bevy

- Built a reinforcement-learning environment in Rust + Bevy with no external ML framework, deterministic 60 Hz multi-car simulation, custom observation space, and a handwritten PPO with clipped surrogate, asymmetric actor-critic, and AdamW. Cars learn end-to-end; fixed a 43x regression by flattening nested-Vec weights to row-major.
- Shipped a biologically-inspired learner running alongside PPO: a sparse graph network with three-factor plasticity, eligibility traces, reward neuromodulation, homeostatic regulation, and continual-backprop structural growth, a single agent that learns continuously across its entire lifetime, with no weight resets and no backpropagation.

Image Browser: Multi-Encoder Local-First Image Manager

Rust, Tauri, React, ONNX

- Built a desktop app for browsing, tagging, and semantically searching personal image libraries entirely offline. Three image-embedding models (CLIP, DINOv2, SigLIP-2) run via ONNX Runtime; per-encoder rankings are combined with Reciprocal Rank Fusion (Cormack 2009) to surface conceptual, structural, and descriptive similarity at once.
- Built in Tauri 2 + React 19: Pinterest-style masonry, multi-folder library with filesystem watcher and orphan detection, AND/OR tag filtering, per-image annotations, typed IPC error envelopes, and SQLite in WAL mode with separate read/write connections so the UI stays responsive during indexing.

Aurix: Local-First DeFi Analytics Platform

Rust, Tauri, React, TypeScript

- Building Aurix, an on-device Ethereum analytics platform on Tauri 2 + React 19 + Rust spanning cross-DEX arbitrage, V3 LP backtesting, wallet tracking, gas prediction, and risk modelling; the arbitrage scanner reads raw JSON-RPC with hand-crafted ABI encoding (no ethers-rs), decoding Uniswap V3 sqrtPriceX96 and V2 reserve ratios via BigUint.
- Shipped the V3 LP backtester with Q64.96 fixed-point math, multi-asset benchmarking against DeFi-native and TradFi baselines, and regime-conditional capital allocation; built a React dashboard with hand-rolled SVG charting and a TypeScript insight engine computing rolling statistics, trailing run detection, and severity-graded notifications.

Nyquestro: High-Performance Order Matching Engine

Rust

- Building a from-scratch exchange simulation in safe Rust targeting a lock-free order book with price-time priority matching, a binary UDP wire protocol, a real-time risk layer (fat-finger protection, rolling VaR circuit breaking), and a market-making agent with order-flow-imbalance signals and inventory-aware quote placement.
- Shipped the matching engine MVP with multi-instrument routing, a Ratatui observability dashboard rendering live latency and fill-rate infographics, and a Coinbase Advanced Trade WebSocket bridge feeding real BTC-USD / ETH-USD / SOL-USD market depth.

Education

University of York

York, UK

Bachelor of Engineering (BEng) in Computer Science

September 2022 – June 2025

- Final-year dissertation + practical project, *Neuronika: AI-Driven Intelligent Note Taking and Organisation System*. Reviewed PKM/IR literature, identified gaps in folder-based and tag-based systems, and built a React + TypeScript SPA where Mistral Small 3.1 24B drives adaptive multi-layered tag generation feeding three retrieval surfaces (dynamic folder hierarchy, vis.js interactive graph, Fuse.js semantic search). Four-participant pilot vs Obsidian showed a 355% average information-retrieval speedup across find-by-title, find-by-context, and group-retrieval tasks.
- Built CNN, MLP, and RNN models for image classification, predictive analytics, and cryptographic attack simulation.
- Led an 8-person team developing a Java/libGDX simulation game; owned architecture, features, and CI testing.

Skills

- Languages:** Rust, Python, C++, TypeScript, JavaScript, Java
- Systems:** Lock-Free Data Structures, Multithreading, Memory Safety, Low-Latency Optimisation
- AI/ML:** PyTorch, TensorFlow, ONNX Runtime, NEAT, DEAP, XGBoost, scikit-learn
- Desktop & Full-Stack:** Tauri, React, SQLite, Node.js
- Finance:** Order Book Mechanics, Market-Making, Ethereum RPC, AMM Mathematics, Quantitative Risk Modelling
- Mathematics:** Linear Algebra, Calculus, Probability, Optimisation Theory