

Marcus Prgin

Marcusprgin121@gmail.com | (226) 808-9481 | [Linkedin.com/in/marcus-prgin](https://www.linkedin.com/in/marcus-prgin) | [Github.com/marcusprgin](https://github.com/marcusprgin)

TECHNICAL SKILLS

Languages: Go, Python, TypeScript, JavaScript, SQL, C, C++, Ruby, Bash, HTML, CSS

Frameworks & Libraries: React, Next.js, React Router v7, Tailwind CSS

Infrastructure & DevOps: Kubernetes, Terraform, Docker, GitHub, Cloudflare, Vercel

EXPERIENCE

Software Engineering Intern | Enzuzo

May 2026 – Aug 2026

Cloudflare Workers, React Router v7, TypeScript

- Corrected inflated usage metrics, fixing a customer reported at **330%** of quota to an accurate **31%**, by replacing a proxy visitor flag with an exact per-day distinct count aligned to billing enforcement
- Eliminated recurring CPU-limit failures (Error 1102) on high-traffic dashboard tabs by precomputing dozens of per-request queries into hourly Cloudflare D1 rollups instead of running them in the render path
- Removed code deploys from the blocklist-change process entirely by migrating a hardcoded 95-entry blocklist to a Cloudflare D1 source of truth with a human-overrides-automation precedence model
- Kept a **34,451-account** feed accurate through upstream API outages with a four-level cache fallback and a six-rule validator that rejects corrupt but successful-looking responses
- Fixed systematically wrong quota percentages by anchoring each account's usage window to its Stripe billing-cycle anniversary, handling month-length edge cases (e.g., Jan 31 → Feb 28 → Mar 31)
- Built passwordless authentication with signed magic links, constant-time token comparison, and a **15-minute** expiry that rejects expired and forged tokens

PROJECTS

Rate Limiter

May 2026 – Aug 2026

Go, Redis, Lua, Prometheus, Grafana, Docker, k6

- Built two rate-limiting algorithms (sliding-window counter, token bucket), each with in-memory and Redis-backed implementations behind one interface for config-level strategy swaps
- Fixed a distributed race between counter increment and expiry with a single atomic Redis Lua script, verified under **1,000** concurrent goroutines with Go's race detector to stop windows silently doubling under load
- Added cost-weighted quota so a single call can consume multiple units — the token-cost billing model used by OpenAI and Stripe
- Designed a layered limiter enforcing per-user → per-tenant → global limits in sequence, short-circuiting at the first denial and returning the tightest remaining quota
- Built an adaptive limiter that tunes throughput with an AIMD control loop (as in TCP congestion control), using a lock-free atomic multiplier to avoid mutex contention on the hot path
- Cut Redis round trips **~85%** with per-node quota leasing, dropping P99 decision latency from **~1ms to ~0.2ms**; held **zero 5xx** across **28,440** requests at 300 rps while restarting Redis **4x** mid-run

AI Code Security Agent | ResolvePR

GDG Hacks | May 2026

Go, Claude API, tree-sitter, Google Cloud Run, Neon Postgres, Next.js/Vercel

- Cut security false positives **40%** by building a Go engine that parses each PR diff at the syntax-tree level, sending only changed functions to the Claude API and posting findings as inline comments pinned to exact lines
- Wrapped the Claude API in prompt guardrails and a test suite, tuning confidence thresholds to surface only high-signal findings
- Built an HMAC-verified GitHub webhook pipeline on Google Cloud Run (Neon Postgres) with a Next.js/Vercel dashboard for severity filtering, false-positive dismissal, and real-time critical/high alerts

SQL Query Engine

May 2026 – Aug 2026

Python, pytest, pyarrow

- Cut I/O up to **94%** on wide CSVs by implementing predicate pushdown and projection pruning — pushing filters to the scan and reading only referenced columns
- Cut distinct-count memory from $O(n)$ to $O(1)$ at **~0.8%** error by replacing exact counts with a 16 KB HyperLogLog sketch (as used by Redshift and BigQuery)
- Added an approximate top-k aggregate on a Count-Min Sketch (fixed 110 KB) returning the most frequent values in sub-linear memory regardless of distinct-value count

EDUCATION

University of Guelph

Guelph, ON

Bachelor of Computing, Computer Science CO-OP (Honours)

Expected May 2030

- Relevant Coursework: Data Structures & Algorithms, Operating Systems, Distributed Systems, Databases, Computer Networks, Object-Oriented Design