

ALEXEI BROWN



Software Engineer — Full-Stack, Product & Platform

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Full-stack software engineer shipping end-to-end products: lead-discovery and automated site generation at scale (tradez.au — 1,655 deployed customer sites on Cloudflare), continuous OSINT pipelines with auto-journalism (chanalyse — 5,400+ artifacts), messaging bridges, and trading systems. Comfortable across Python backends, web scraping, Cloudflare Workers/Pages, Tauri/Rust desktop apps, and LLM-driven automation.

TECHNICAL SKILLS

Languages Python (primary) · JavaScript / TypeScript · SQL · Kotlin / Java (Android) · Familiarity with C / C++ and Go

AI / ML PyTorch, TensorFlow, scikit-learn · pandas, NumPy, signal-processing pipelines · Deep learning, attention / transformer architectures · Computer vision (OpenCV, MediaPipe, ArcFace) · NLP, text classification, embeddings, LLM integration · Model evaluation, benchmarking, ablation studies · Behavioural intelligence over time-series sensor streams

Sensor & Signal Software-Defined Radio — HackRF / Aircspy / RTL-SDR panoramic scanning, RF spectrum analysis · Real-time DSP: decimation, phase-continuous VFO mixing, anti-alias filtering (rfai-dsp library, 18 tests) · Live waterfall/spectrum visualisation, demod pipelines (WFM/NFM/AM/SSB), RMS-based VAD · Bluetooth Low Energy (BLE) — scanning, fingerprinting, GATT exploration, protocol analysis · Wearable / phone sensor fusion (sleep, HR, HRV, accelerometer, rPPG) · Real-time inference on noisy, incomplete, adversarial data · Speech: Whisper STT (GPU-accelerated via faster-whisper/ROCM), voice activity detection

Infra & MLOps Linux (Arch / CachyOS / NixOS) day-to-day · Docker / containerisation · Git, GitHub, automated CI/CD · OAuth 2.0 implementation · Cloud: Azure (Data Factory, Databricks), GCP (BigQuery), Cloudflare (Pages/Workers) · Edge / on-device inference: Ollama, ONNX Runtime Web, ROCm, quantised models

Robotics & HW MediaPipe-based gesture / hand / face tracking pipelines · Servo control (FEETECH ST-3215-C047) on InMoov i2 robotic hand · SO-ARM101 robot arm with MuJoCo simulation + imitation learning · 3D printing for drones, cinewhoops, payload grabbers, perching legs

EXPERIENCE

Developer Experience Engineer — Sahha · Remote (NZ-based company) · Current

Health Data Intelligence Platform — sensor data → behavioural intelligence

- Build applications and developer interfaces for a biotech health-data platform turning device sensor streams into behavioural intelligence
- Develop backend systems and APIs that transform sleep, step, heart-rate and HRV data into research-backed wellness scores and behavioural archetypes
- Work daily with noisy, incomplete real-world sensor data and ML pipelines that produce population-level insights
- Build integrations for wearables and smartphone health sources via the public showcases [healthconnect.vip](#) and [biomarker.fit](#)

AI Engineer — Hypadrive · Auckland, NZ (remote) · Jun 2022 – 2024

Machine Learning & NLP

- Built NLP datasets and pipelines for email classification and text-analysis tasks
- Tuned ML training parameters and ran structured benchmarking and testing cycles
- Delivered production-ready ML components integrated into commercial platforms
- Worked with custom ML models in healthcare and wellness contexts

Legal Researcher (AI Ethics) — University of Newcastle Law School · Jun – Dec 2021

AI Regulation & Ethics

- Co-authored academic publications on AI regulation and ethics
- Contributed to policy-oriented legal research at the intersection of AI and IP law
- Presented internationally on neurotechnology ethics and innovation

SELECTED PROJECTS

Live demos and full write-ups on [qalarc.com/projects](#)

tradez.au — Directory + Website Builder [tradez.au](#)

Lead discovery → auto-generated mobile-first sites → deployed at scale on Cloudflare (\$0 hosting)

End-to-end small-business platform: scrapes Google Maps for businesses with reviews but no website, qualifies them, auto-generates personalised mobile-first HTML sites (17 design variants) and deploys each to [tradez.au/<slug>/](#) on Cloudflare Pages. 9,264 leads scraped, 1,657 qualified, 1,655 demo sites deployed, 4,568 businesses in the public directory. Includes CRM, outreach tooling and a 3-agent orchestration system.

Stack: Python · HTML/CSS · Cloudflare Pages/Workers · Web scraping · Stripe/PayID

chanalyse — Continuous OSINT + Auto-Journalism qalarc.com/chanalyse

Real-time board scraper → NLP clustering → spike detection → auto-published sourced articles

Full-stack intelligence pipeline that continuously ingests public message boards, runs NLP for topic clustering, sentiment, authenticity and signal detection, flags narrative spikes via z-score detection, and auto-generates balanced, sourced journalistic articles with SEO/OG metadata. Live dashboard with rolling 24h/7d/30d windows; 5,400+ story artifacts and 14 auto-published articles to date.

Stack: Python · SQLite/FTS5 · NLP · LLM article generation · Cloudflare Pages

Qalarc Hub — Messaging Bridge github.com/fivelidz/signal-whatsapp-hub

Single Signal + WhatsApp session exposed as a localhost HTTP API for AI agents

Tauri desktop app that consolidates signal-cli (Java) and whatsmeow (Go) into one local REST API on port 8769, so AI agents route all messaging through a single owned session instead of fighting over companion states. Health checks, send/read endpoints, append-only JSONL inbound log, sandboxed public-user vs authorised-user routing.

Stack: Tauri (Rust + TypeScript) · signal-cli · whatsmeow (Go) · REST API

Adaptive Trading System qalarc.com/projects/adaptive-trading

Multi-strategy algo trading with regime detection, Kelly sizing + live broker integration

Rich terminal UI for algorithmic trading: 10+ strategies (SMA, RSI, MACD, Bollinger, ML-based, Donchian, dual-momentum, Keltner), a strategy orchestrator, market-regime detection, Kelly/ATR/vol-target position sizing, orchestrated multi-strategy backtesting, paper trading and a parallel bot fleet. Integrates with Alpaca for live and paper trading.

Stack: Python · Rich (TUI) · pandas · scikit-learn · Alpaca API

gmux — Gesture Terminal Multiplexer qalarc.com/projects/gmux · [live demo](#)

Gesture and voice layer on top of tmux for running multiple AI agents

Reimagining terminal multiplexing for AI-agent workflows: gesture-controlled agent dashboard, voice commands, tab cycling between tasks/chat/hardware, pinch-to-click overlay, 10 themes, live mock agent state.

Stack: TypeScript · MediaPipe · Terminal UI · WebGL

Orbital — N-Body Gravity Puzzle (Android) qalarc.com/projects/orbital

Native Kotlin + custom OpenGL ES 2.0 renderer, deterministic physics — 2.6 MB APK

Slingshot gravity puzzle built native in Kotlin (not Unity) for a 2.6 MB APK with instant cold-start. Deterministic semi-implicit Euler integrator with substeps (verified <1% drift over 20s for stable orbits), trajectory prediction that matches the live sim exactly, and a 4-pass OpenGL ES 2.0 renderer with procedural planet shaders, glow bloom and particle systems. 20 handcrafted levels + 3 sandbox systems.

Stack: Kotlin · OpenGL ES 2.0 (custom GLSL) · Android SDK 24-34 · Deterministic physics

Visual Biomarker Analyzer qalarc.com/projects/camera-biomarkers · [live demo](#)

Heart rate, HRV and SpO₂ from a webcam — 100% in-browser rPPG

Browser-based remote photoplethysmography pipeline extracting heart rate, HRV, SpO₂ and stress indicators from regular webcam video. No wearable required — pure signal processing on a noisy real-world input.

Stack: JavaScript · rPPG · Signal processing · Browser ML

EDUCATION

University of Technology Sydney

Master of Intellectual Property and Patent Law · In Progress

University of New South Wales

Bachelor of Science (Honours), Neuroscience & Pharmacology · First Class Honours

Generation Australia

Data Analytics Graduate Program

- Full-time, project-based training in data analytics, Python, SQL and data visualisation
- Led sprint planning, stand-ups, retrospectives and team coordination
- SQL, Python (pandas, NumPy, Seaborn), Power BI, advanced Excel

KEY COMPETENCIES

Backends	Python (Flask/aiohttp), REST APIs, SQLite/FTS5, async pipelines, web scraping at scale
Cloud / Edge	Cloudflare Pages/Workers, subdomain routing, \$0/host-site economics, CI/CD
Desktop Apps	Tauri (Rust + TypeScript), cross-platform native shells
Product at Scale	tradez.au — 9,264 leads → 1,655 deployed sites; chanalyse — 5,400+ auto-generated artifacts
LLM Automation	Multi-agent orchestration, auto-journalism, NLP pipelines, LLM-driven site generation
Frontend	HTML/CSS (17 design variants), vanilla JS dashboards, mobile-first static sites