Lior Rozin

Software Engineer

contact@liorrozin.com | Ottawa, ON, Canada | Portfolio

Summary

Full-stack software engineer building across web, mobile, embedded firmware, and ML. Architected an analytics platform that cut API costs by 90%, and shipped an end-to-end biosignal system spanning C firmware to cloud dashboards. Comfortable owning products from first commit to production.

Experience

Shoebox Ltd. — Ottawa, ON
Core Services Developer — 05/2024 - Present

- **Analytics platform:** Architected a full-stack ticket intelligence system (FastAPI + React/TS) with VoyageAI embeddings, ChromaDB vector storage, and HDBSCAN clustering. Optimized batch ingestion and rate limiting, cutting category generation API costs by 90% through persistent caching.
- **Test automation:** Pitched and built a prototype dashboard using TypeScript/Node + Puppeteer and React to automate multiple testing procedures, achieving a 75% reduction in testing cycle times (aligned to ANSI s3.6-2018).
- **Calibration system:** Owned the Unified Calibration System (an ANSI s3.6-2018-compliant Python service integrating with APx API and S3 storage). Diagnosed and resolved prod failures across Python & .NET codebases, reducing field calibration errors.
- **Test coverage:** Wrote pytest unit and functional tests under ANSI s3.6-2018, improving coverage for data ingestion, rate limiting, and batch processing flows.

Body M3chanix — Ottawa, ON
Lead Full Stack & Embedded Engineer — 02/2024 - Present

- **End-to-end ownership:** Sole author of the web app, BLE bridge firmware (Zephyr RTOS on NORA-B1), and PIC18F sensor firmware. Built a React Native (Expo) mobile app and led a team of 2 on an Electron desktop client, all backed by Flask API.
- **ML pipeline:** Trained and deployed a PyTorch Temporal Fusion Transformer on biosignal data (HR, SpO_2, temperature) for real-time anomaly detection, with full data pipelines for feature engineering, normalization, and inference serving.
- **Firmware:** Developed C firmware for a Nordic nRF52840-based NORA-B1 (Zephyr RTOS, ubxlib) and PIC18F on a custom PCB. Partitioned tasks so PIC18F handled HR/SpO_2 sensor collection while NORA B1 managed BLE GATT and edge processing, connected via UART.
- **Cross-platform apps:** Engineered Windows/macOS/Linux desktop apps with Electron + React + MobX (SOC2 compliant), and an iOS/Android app with React Native (TypeScript) + Zustand. Both communicate over secure, encrypted BLE.
- **Web platform:** Built the Flask/Python backend with PostgreSQL/MongoDB, a React/TypeScript dashboard for live telemetry visualization, and Azure cloud integration. Browser-based device connectivity via Web Bluetooth.

Freelance Developer — 2021 - 2024
ML Developer

- **Hackathon win:** Built a blockchain-based patient-journey app with a team of 5 at PennApps x Wharton, winning Popular Choice and Best Use of DeSo.
- **Generative models:** Implemented VGG19 neural style transfer and trained CycleGAN + DCGAN/WGAN in PyTorch with modular training utilities (StepLR, Adam), checkpoint management, and TensorBoard monitoring.
- **UDP telemetry:** Built a high-performance C++ UDP service using POSIX non-blocking sockets with strict binary message packing, endianness handling, and sensor scaling for mission-critical landing-event detection.

University of Bonn — Remote
GUI Developer (Robotics) — 05/2022 - 07/2022

- **Cross-platform GUI:** Led development of a PyQt (PyQT) desktop GUI for University of Bonn researchers, refactoring legacy code and integrating new functionalities in close collaboration with the research team.
- **SLAM research support:** Extended and stabilized the SLAM toolchain used in a robotics study, contributing software support and documentation for an IEEE-R&A publication.

https://ieeexplore.ieee.org/abstract/document/9956025

Skills

Languages
Python, TypeScript, JavaScript, C++, C, SQL, HTML/CSS.

Backend & Cloud
FastAPI, Flask, Node.js, Express, PostgreSQL, MongoDB, Firebase, Docker, Azure, Vercel.

Frontend & Mobile
React, React Native (Expo), Electron, Tailwind CSS, Vite, MobX, Zustand.

ML & Embedded
PyTorch, ChromaDB, VoyageAI, HDBSCAN, Zephyr RTOS, BLE (GATT), ROS2, OpenAI API.

Projects

City Alerts — Full-Stack Civic Notification App 2024/01 - 2024/12

- **Serverless backend:** Built Node.js/TypeScript REST APIs on Vercel with Firestore persistence, strict schemas, date-based indexing, and automated RSS/REST/Puppeteer data ingestion pipelines.
- **LLM integration:** Automated daily two-bullet summaries via the OpenAI API with headline enrichment and road-based filtering, reducing manual triage to near-zero.
- **Mobile app:** Shipped a React Native (Expo) app with FlashList rendering, typed API clients, pull-to-refresh, deep linking, and 7-language i18n (EN, AR, ES, FR, JA, KO, HI) with RTL support.

SpotifyPlaylistManager 02/2024 - 05/2024

- **Full-stack TypeScript:** Vite + React + TypeScript frontend with Tailwind and Radix UI for large playlist operations (merge, dedup, bulk edit) and virtualized rendering for 10,000+ track playlists.
- **Auth and backend:** Spotify OAuth with rate-limit-aware chunked writes, plus Firebase Cloud Functions (Express) for secure client credential management and preview URL generation.
- **Playback integration:** Preview playback via the Spotify Web Playback SDK with OAuth token management and chunked batch write coordination.

CPRT — Robotics Perception & Manipulation 2023/09 - 2024/04

- **Stereo vision:** Integrated a ZED 2 stereo camera with ROS2 Humble on Jetson AGX Orin (Ubuntu), configuring drivers, depth sensing, point cloud generation, and SLAM workflows for a competition robotics platform.
- **Perception pipeline:** Built ROS2 Python/C++ nodes connecting YOLOv7 object detection to depth-based 3D localization, inverse kinematics, and motor actuation on a 6-DOF arm.
- **Inverse kinematics:** Implemented an IK solver using homogeneous transforms, validated through Gazebo Ignition simulation and driver-level hardware tests.

UNEP x TKS 03/2023 - 08/2023

- **Campaign leadership:** Led a team of 4 to develop a Global YouTube Campaign funding clean cooking distribution in rural India. Used Python and BeautifulSoup to mine YouTube, TikTok, and Instagram. Pitched to UNEP PMs, resulting in 50% implementation.
- **Data mining:** Scraped YouTube, TikTok, and Instagram using Python and BeautifulSoup to identify targeting opportunities and guide campaign design.
- **Expert research:** Conducted interviews with over 10 field experts to map challenges and opportunities in the rural clean cooking sector.

Photo Triage ML Pipeline 2022

- **Multi-model pipeline:** Orchestrated MTCNN face detection, fastdup near-duplicate clustering, and variance-of-Laplacian blur scoring in a modular PyTorch-based Python CLI. Achieved ~60% faster photo review for professional photographers.
- **GPU optimization:** GPU-aware batch processing with configurable thresholds, automated RAW-to-JPEG conversion, organized file output, and structured error logging.
- **Impact:** Delivered ~60% reduction in manual photo review time for photographers at Invest Ottawa.

Education

Carleton University Bachelor's of Computer Science and Mathematics (Honours)
Concentration in Statistics and Computing Attended 2023-2026

Completed 3 years of coursework. Core Member of the Carleton Planetary Robotics Team.

Awards

NASA ISAC - Global Nominee 2021/10
NASA Space Apps
Project

PennApps x Wharton — Popular Choice & Best Use of DeSo
PennApps
Built a blockchain-based patient-journey app with a team of 5.

Certifications

Artificial Intelligence A-Z™: Learn How To Build An AI
Udemy

Complete Tensorflow 2 and Keras Deep Learning Bootcamp
Udemy

Diplôme d'études en langue française B2
France Éducation international

MLOps Essentials: Model Development and Integration
LinkedIn

Languages

English
Fluent

French
Fluent

Russian
Native

Hebrew
Native