

EDUARDO MONTILVA

Software Engineer | Backend, Distributed Systems & Applied AI

Latam · Remote · UTC-4

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EXPERIENCE

Software Engineer — Beast Industries (@MrBeast)

Remote · July 2024 – Present

- Build and maintain services across a large Java and Kotlin monorepo covering analytics, data collection, ranking, outlier detection, search, payments and alerting.
- Built and lead the Python data pipelines project end to end, along with the infrastructure it runs on: ingesting millions of records and processing them into data ready to be served to internal services and user-facing products, with Databricks handling the heavy batch work.
- Took an AI image and thumbnail generation service from an empty repository to production, including model integration, the async job queue, storage and the public API.
- Design event-driven systems on top of RabbitMQ, backed by PostgreSQL, Cloud Spanner or ClickHouse depending on whether the workload is transactional or analytical.
- Currently building out backend services on a NestJS and TypeScript stack alongside the JVM platform.
- Own the embedding and NLP work those pipelines carry: GPU batch inference at scale, transcript analysis, topic classification and brand-safety scoring.
- Built a retrieval-augmented generation service so internal users can query analytics data in plain language.
- Maintain roughly 70 Helm-deployed services on GKE through Argo CD, along with the infrastructure-as-code, ingress, certificate and DNS automation and OpenTelemetry tracing around them.
- Write the Kotlin authentication services (token issue and refresh, session handling) that every client surface depends on.
- Contribute to product frontends in Next.js and a React Native mobile app when a feature needs to be delivered end to end.

Backend Developer & Project Manager — Talamo Iberica

Remote · November 2022 – July 2024

- Designed and built a blockchain platform with services in TypeScript, JavaScript, Python and C++, including the security and peer-to-peer communication layers.
- Wrote the REST APIs and WebSocket protocols (Node.js, Express, PostgreSQL) carrying peer-to-peer traffic and client-to-backend communication.
- Broke the system into microservices to handle several thousand daily requests from the platform's active users.
- Planned sprints, task breakdown and workflow for a team of more than 10 developers.
- Set up the CI/CD pipelines used to deploy blockchain nodes and APIs.

Software Engineer — Freelance / Private Contract Work

Remote · February 2019 – November 2022

- Delivered backend systems for e-commerce, blockchain and SaaS clients using Python (FastAPI, Flask), Node.js with TypeScript, Java, C++ and some Go.
- Designed relational and document schemas across PostgreSQL, MySQL and MongoDB.
- Built the data acquisition pipelines that fed downstream machine learning models.
- Trained and shipped models in production: CNNs for image classification, RNNs for text generation, regression models, and transformer-based language models.
- Implemented CI/CD pipelines on AWS for fast deployment.
- Worked alongside frontend developers in React, writing hooks and components for data fetching and state updates.

Electrical & Power Systems Engineer — Independent Consultant

Contract · February 2019 – July 2022

- Modeled and simulated the SIEPAC Central American transmission network (100+ busbars, 15 substations) in DigSILENT PowerFactory and ETAP, running AC and DC load flow studies.
- Wrote optimal power flow algorithms in Python and MATLAB, including nonlinear and MINLP formulations with equality and inequality constraints.
- Developed stability control strategies for synchronous generators, motors, wind turbines, photovoltaic systems and EV charging stations.
- Designed the low-voltage distribution for a residential building inside the TACOA substation in La Guaira: short-circuit calculations, panel sizing and cable sizing.
- Built transmission line and tower models in PLS-CADD and PLS-Tower, with protective device coordination.
- Designed photovoltaic systems and ran Simulink simulations against real-world operating scenarios.

EDUCATION

B.Sc. Electrical Engineering — Universidad Simón Bolívar

December 2018

- Thesis: Analysis of the Electrical Interconnection System of the Central American Countries (SIEPAC Network)

PRODUCTS

OriginStat (originstat.com) — Cookieless web analytics that ties every visit to the revenue it produced.

SocialEar (socialear.app) — Social listening across Reddit, Hacker News, Lobsters, YouTube, Instagram, TikTok and X.

bakepdf (bakepdf.app) — Every PDF tool people actually use, in one place, running in the browser.

SELECTED PROJECTS

lazymongo — A lazygit-style terminal UI for MongoDB, written in Rust over ratatui and shipped as a single 3 MB binary. Documents stream through cursor batches under a hard memory cap, so opening a hundred-million-document collection costs what opening a small one does, and every query runs off the render path so the interface never blocks on the network.

Powersys platform — Web-native power system simulation platform written in Rust. Power flow, OPF, short-circuit, transient, EMT and unit-commitment solvers run as independent binaries over a shared domain core, with a sparse-Jacobian Newton-Raphson implementation and event-driven job dispatch.

powersys — Python package for power system analysis, optimization and dynamics. Published to PyPI; the Rust platform above grew out of it.

gnn-opf — Power system state estimation through optimal power flow using graph neural networks. The grid is already a graph, so the inductive bias comes for free.

claude-broker — AMQP-based inter-session messaging for AI coding agents, written in TypeScript over a pseudo-terminal wrapper, so several agents working the same problem can actually talk to each other.

Unit commitment with RL — The unit commitment problem approached with reinforcement learning, built on Stable-Baselines3 instead of a mixed-integer solver.

js-mat / wtalkie — TypeScript packages for matrix mathematics and safer WebSocket communication between APIs and backends.

TECHNICAL SKILLS

Languages	Python, Java, Kotlin, TypeScript, JavaScript, Rust, C, C++, Go, SQL, MATLAB, Bash
Backend	Spring, NestJS, FastAPI, Flask, Express, Node.js, REST, WebSockets, gRPC, RabbitMQ, Event-driven, Microservices
Data	PostgreSQL, Cloud Spanner, ClickHouse, MySQL, MongoDB, Redis, Databricks, BigQuery, Supabase, Vector databases
ML	PyTorch, TensorFlow, Stable-Baselines3, Embeddings, RAG, NLP, CNNs, RNNs, Transformers, GNNs
Optimization	Newton-Raphson, Interior point, L-BFGS, SGD, Adam, Convex optimization, Nonlinear programming, MINLP, Genetic algorithms, Optimal power flow
Cloud	GCP, AWS, Kubernetes, Helm, Argo CD, Docker, Terraform, CI/CD, OpenTelemetry, Grafana
Frontend	React, Next.js, Vue, React Native
Engineering	DigSILENT PowerFactory, ETAP, PLS-CADD, PLS-Tower, Simulink, AutoCAD
Spoken	Spanish (native), English (professional)