



VITALII ZNAK

Senior Full-Stack Engineer

~ \$ whoami

→ design → experiment → evidence → ship

📍 Zurich, Switzerland 🌐 Citizen: Portugal (EU) · Ukraine 🇨🇭 Swiss Permit B ✅ Available immediately
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PROFESSIONAL OVERVIEW

Full-stack engineer, 10+ years. I work backwards from how the result will be checked: map the flows and failure modes before writing code, then test the assumptions. Day to day that means React + TypeScript on the front, Python/FastAPI and Node.js on the back, REST APIs, CI-gated workflows. I keep choosing work near evidence-heavy domains: an AI data-prep UI for ML training data, PV yield simulation, computer-vision rooftop analysis, and fleet time-series analytics in solar. Happiest hands-on, owning features end-to-end, from design through deployment, go-live, and production support. Mathematics roots in Kyiv; I write about how I think at signumspace.net.

SKILLS AND EXPERTISE

★ Main Tech Stack:

TypeScript, React, Python, FastAPI, Node.js, SQL, Docker

🔧 Programming Languages

Extensive (10 yrs): TypeScript/JavaScript, Node.js

Proficient (5 yrs): Python

🔧 Backend

FastAPI, REST APIs, Node.js, NestJS, Next.js, GraphQL, RabbitMQ, Nginx

🖥️ Frontend

React (since its first releases), SolidJS, Vite, Canvas/WebGL, CSS-in-JS (Emotion), MobX, Chrome extensions

🧪 Testing & Quality

pytest, Vitest, Playwright (unit & end-to-end); CI-gated merges

🗄️ Data

PostgreSQL, MongoDB, Redis, BigQuery, DuckDB; Polars ETL, time-series analytics, data modeling

🔧 Infrastructure & DevOps

Git, CI/CD, Docker, Kubernetes, Linux, AWS, Azure

🏗️ Software Architecture

Distributed systems, microservices, event-driven architecture; clean architecture & DDD; system optimization, API design, scalable solutions.

🧠 Applied AI / LLM

RAG pipelines, LLaMA/Ollama, OpenAI API, LangChain, vector DBs; LLM application engineering and computer-vision integration.

🗣️ Domains & Specialisms

Internal data & simulation tooling for analysts, engineers, and operators (PV yield, fleet time-series, data-prep UIs); Real-time streaming (WebRTC, DRM, WebSockets)

🗣️ Spoken Languages

English (fluent), Portuguese (fluent), Ukrainian (native), German (A2-B1, improving)

WORK EXPERIENCE

enshift AG | Senior Full-Stack Engineer

Mar 2025 – May 2026 | Zurich, Switzerland

Project(s) domains: Solar energy (PV sustainability simulation, computer-vision rooftop analysis, solar-site monitoring)

- Contributed to a solar-panel **sustainability & yield simulation** to model rooftop PV viability and long-term performance; outputs people commit investment and planning decisions against, so correctness was the feature.
- Integrated **FHNW's computer-vision solution** for rooftop analysis into the enshift system, automating roof segmentation and usable-area estimation for solar-potential assessment.
- Built **production monitoring for operational solar sites** to verify the outputs held up in production: **Polars ETL pipelines** feeding **DuckDB** for fast analytics over high-volume fleet time-series, with a **React + TypeScript** front-end on a **FastAPI** backend.

Tech: Python, FastAPI, pytest, React, TypeScript, Playwright, DuckDB, Polars (ETL), Computer Vision

Self-Directed AI/ML — Projects & Study

Dec 2023 – Feb 2025 | Zurich, Switzerland

- **Neural-network visualizer:** Hand-built from first principles (forward pass, backprop, training loop) — no ML library, no LLM. [Live demo](#).
- **Self-directed AI/ML:** neural-network fundamentals, ML, statistics, model evaluation.

Tech: [TypeScript](#), [SolidJS](#), [Python](#), [Plotly](#)

Bexio AG | Senior Full-Stack Engineer

Jul 2023 – Oct 2023 | Zurich | Hybrid

Project(s) domains: Accounting Software

- Joined as Lead to drive the rebuild of a stalled accounting platform; delivered an **architecture & code review** that pinpointed the key scalability and performance bottlenecks.
- **Designed and delivered a new database model** and the move to a better-fitting stack (Next.js / Nest.js / Prisma); both shipped as working artifacts.

Tech: [Next.js](#), [Nest.js](#), [TypeScript](#), [React.js](#), [MySQL](#), [Prisma](#)

Phenix Real Time Solutions | Full Stack Software Engineer

Jan 2022 – Jan 2023 | Zurich | Hybrid

Project(s) domains: Real-time video streaming, DRM

- Worked with the [castLabs team to integrate DRM into the WebRTC stack](#): joint architecture sessions, paired through the gnarly edge cases. The PoC became the basis of the publicly announced Phenix × castLabs partnership.
- Tuned the streaming pipeline for stability and low-latency delivery under real production load — live-event traffic, where a defect is an incident, not a ticket.

Phenix was later acquired by StatsPerform.

Tech: [Node.js](#), [Express](#), [RabbitMQ](#), [TypeScript](#), [BigQuery](#), [SQL](#), [WebRTC](#), [WebSockets](#)

Komgo SA | Full Stack Software Engineer

Dec 2019 – Dec 2021 | Geneva | Hybrid

Project(s) domains: Commodity trading, KYC

- Designed the GraphQL layer in collaboration with the backend and frontend teams. Shared ownership, no thrown-over-the-wall handoffs.
- Built REST and GraphQL APIs and React interfaces for commodity trading and KYC workflows in a Kubernetes-based microservices environment.
- Worked cross-functionally with product, design, and other engineering teams on complex financial processes.

Tech: [Node.js](#), [Express](#), [RabbitMQ](#), [TypeScript](#), [Apollo GraphQL](#), [React](#), [Redux](#)

Self-Employed | Full-stack Engineer (Contractor)

May 2016 – Dec 2019 | Remote

Worked as a contractor software engineer across client engagements. Owned architecture, implementation, and end-to-end delivery on full-stack web, blockchain, and data-processing projects.

Selected client projects:

- **Brainalyzed (AI/ML client):** Led the client project to build an AI-driven data-preparation platform. Delivered Python data-processing backend + drag-and-drop TypeScript/React UI, enabling data scientists to prepare training datasets without writing custom scripts.
- **Chromaway (Web3 / Blockchain):** Technical lead for client blockchain prototypes. Built the initial PoC of the Green Assets Wallet and contributed core algorithms to the "Mental Poker" cryptographic protocol for secure, private decentralized transactions.
- **IntellectEU (Web3 / Blockchain client):** Delivered Hyperledger-based identity-management solutions for enterprise clients.
- **TvAppAgency (SmartTV / Video Streaming, acquired by Brightcove):** Built CMS API and data-collection solution for Smart TV applications.

Tech: [TypeScript](#), [React](#), [MobX](#), [Ant Design](#), [Python](#), [Go](#), [Recharts](#), [webpack](#), [Canvas API](#)

E-Borealis — Software Engineer (Full-time)

2014 – May 2016 | Funchal, Madeira, Portugal

Engineered database, caching, and front-end performance for one of the higher-traffic video-streaming platforms in its market, sustaining **~100,000 concurrent viewers at peak**. Embedded in the product team throughout.

Tech: [PHP \(Laravel/CodeIgniter\)](#), [jQuery](#), [MySQL](#), [Nginx](#)

Founder & CTO — VsComments

Feb 2013 – 2014 | Funchal, Madeira, Portugal

Founded [VsComments](#), a third-party commenting platform, through the Startweb programme at Startup Madeira. Built it from concept to market, owning product, architecture, and technical go-to-market.

Tech: [Node.js](#), [React](#), [MongoDB](#), [ArangoDB](#)

ENGINEERING PHILOSOPHY

How I build, in short:

- **First-principles reasoning:** decisions grounded in evidence and how the system actually behaves.
- **Simplicity as strength:** the smallest design that holds under load.
- **Trust through transparency:** important outputs stay traceable and explainable.
- **Clarity creates speed:** deep comprehension prevents more waste than fast typing.
- **LLMs as power tools:** I use them fluently; they speed up the typing, not the thinking. The more code LLMs write, the more system design and guardrails matter. Architecture, design decisions, and knowing exactly what the system does — that stays mine.

EDUCATION

Universidade da Madeira

Licenciatura (BSc) | Engenharia Informática (Computer Engineering) | 2010 - 2016

Taras Shevchenko National University of Kyiv

Mathematics | attended 2008 - 2011, transferred to Portugal (not completed)

Advanced Professional Development & Self-Directed Study

- Self-directed study via [MIT OpenCourseWare](#)
Worked through MIT's computer-science curriculum: algorithms and data structures through to AI and machine learning.
- Ongoing Professional Development
Regularly take advanced online courses on [edX](#) and other OpenCourseWare platforms to enhance skills in statistics, data visualization, machine learning, and programming. Read papers and blog posts on computer science and software engineering, and watch educational content like [Karpathy's Zero-to-Hero](#), [StatQuest](#), and [3Blue1Brown](#).

Hackathons

- **Hackathon, 2017.** Solo build of a "SeeFood" image classifier, the "Not Hotdog" app from *Silicon Valley*.
- **TAD Hack Lisbon, 2016.** Solo: "HungryHippos", a multiplayer game embedded inside a live video chat. (*Node.js*, *WebRTC*, *Socket.io*, *Canvas*)
- **2nd place — Hackathon Madeira, 2015.** Solo, 24-hour build: a Levenshtein-distance engine that surfaces the most common phrasing across many inputs. (*Node.js*, *ArangoDB*, *MongoDB*)

HOBBIES & INTERESTS

Traveling, swimming, hiking, backpacking, SUP boarding, running; popular science, math rabbit holes, and small ML experiments — sometimes I dig deep into a CS or science topic just for the fun of it