

Mikko Numminen

Full-Stack Developer / AI Engineering & Multi-Agent Workflows

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Portfolio: mikkonumminen-dev.vercel.app GitHub: github.com/MikkoNumminen



ABOUT

Full-stack developer building production applications with AI-native workflows. Currently maintain six production projects, all developed using Claude Code with multi-agent orchestration and custom AI skill definitions. Published cross-repo calibration study benchmarking LLM performance across models and corpora, quantifying token savings and output reliability. Strong focus on automated testing, security, and accessibility. 24+ years in customer-facing senior sales roles before moving into software in 2022 — bringing deep understanding of end-user needs to technical solution design.

SKILLS

AI & LLM:	Claude Code (multi-agent orchestration, custom skills, worktree isolation), Anthropic API, prompt engineering, AI-powered i18n pipelines, LLM evaluation & benchmarking (cross-model calibration studies), TTS voice synthesis (edge-tts, Piper, Chatterbox/voice cloning), token economy optimization
Languages:	TypeScript, JavaScript, Python 3.11+, SQL, Bash
Frontend:	React 19, Next.js 15/16 (App Router), Astro, Three.js, GSAP, Phaser 3, Tailwind CSS, MUI 7
Backend:	Next.js Server Actions, Prisma 6/7, Kysely, Zod, NextAuth v5, REST API integrations (Blizzard API, Open Library, Google Books)
Databases:	PostgreSQL, Neon, MongoDB, raw SQL via typed query builders, dbmate
Testing:	Jest, Vitest, Playwright E2E, React Testing Library, jest-axe (accessibility)
DevOps & CI:	Docker, Kubernetes + Helm, GitHub Actions, Husky, Turborepo monorepos, Sentry, OpenTelemetry, PyInstaller + Inno Setup
Security & Compliance:	RBAC with granular permissions, CSP with nonce, 2FA/TOTP, sliding-window rate limiting, audit logging, GDPR data export and deletion, WCAG accessibility
Cloud & Infra:	Vercel, Cloudflare DNS, Azure (2 years prior employment)

PROJECTS

HRManager · Production-grade HR management system

Granular role-based access control, dashboard analytics, immutable audit trail in MongoDB, and AI-powered i18n across 18 languages.

- 1,828 tests at 91.9% line coverage: 734 UI component tests, 253 server action tests, 75 Playwright E2E across RBAC, audit log, CSP, 2FA, and demo session isolation.
- AI translation pipeline: 18 locales kept in sync via parallel Claude Code agents (~80 s end-to-end) or headless Claude Haiku API for CI.
- Demo session isolation: each "Try Demo" click creates a private data sandbox, auto-expires after 24 h.

Stack: Next.js 16 · React 19 · TypeScript · MUI 7 + MUI X Charts · Prisma 7 · PostgreSQL + MongoDB · NextAuth v5 · Zod 4 · pg-boss · Sentry · OpenTelemetry · Jest 30 · Playwright · Docker · Vercel

hr-manager-pearl.vercel.app • github.com/MikkoNumminen/HRManager

Spacepotatis · Browser game with custom AI development pipeline

Single-player shooter with a 3D galaxy view and top-down combat, shipping with its own audio and AI-skill toolchain.

- ~1,170 Vitest tests plus a documented incident response postmortem with mitigation-first methodology.
- 10 custom Claude Code skills, version-controlled and quarterly drift-audited; estimated ~2.76M tokens saved annually across ~300 invocations.
- Original audio toolchain: music via Strudel live-coding (separate repo: strudel-patterns), voice via my AudiobookMaker on top of Chatterbox TTS. 100% copyright-free.

Stack: Next.js 15 · React 19 · Phaser 3 · Three.js · GSAP · Tailwind CSS · PostgreSQL · Kysely query builder · Neon · NextAuth · TypeScript strict · Vitest · Vercel

spacepotatis.vercel.app • github.com/MikkoNumminen/Spacepotatis

Platform (vuohiliitto.com) · Community platform in active production

Turborepo monorepo running a real online community with multi-tenant architecture, gamification system, and WoW-inspired tabbed chat.

- 1,388 tests across 153 suites + 42 Playwright E2E, coverage threshold enforced (70% lines/functions) via pre-push hook.
- Multi-tenant architecture: two isolated services (Vuohiliitto + Platform) with 25 granular permission keys and zero-credential demo mode.
- Gamification + WoW community features: XP with 10 levels and 17 achievements, daily/weekly/custom quests, WoW-inspired chat with /w whispers, Blizzard API + Raider.IO M+ integration.
- Production hardening: GDPR compliance, 121-finding security audit (106 fixed), audit log of all admin actions, weekly soft-delete cron.

Stack: Next.js 15 · React 19 · TypeScript · MUI 7 · Prisma · PostgreSQL (Neon) · NextAuth v5 · Turborepo · Jest · Playwright · Husky · Vercel

vuohiliitto.com · github.com/MikkoNumminen/Platform

AudiobookMaker · Windows desktop app: PDF/EPUB to audiobook

Three pluggable TTS engines selectable in the GUI, shipped as a zero-dependency Windows installer with auto-updates from GitHub Releases.

- 2,172 tests with pre-commit and pre-push enforcement covering TTS engines, normalizers, and audio pipeline.
- 18-pass Finnish text normalizer with 300+ unit tests: handles numbers, dates, abbreviations, case inflection, loanwords.
- Three TTS engines with subprocess isolation: Edge-TTS online, Piper offline, Chatterbox GPU (isolated venv keeps heavy ML deps out of the main app); ~8× faster parallel CLI for batch books.
- Voice cloning research: evaluating Qwen3-TTS VoiceDesign for natural-language voice profile control and zero-shot cloning from 3-second audio samples.

Stack: Python 3.11+ · PyMuPDF · edge-tts · piper-tts · Chatterbox · CustomTkinter · pydub + ffmpeg · PyInstaller · Inno Setup

github.com/MikkoNumminen/AudiobookMaker

mikkonumminen.dev · Personal portfolio site (itself a portfolio piece)

Hand-crafted counter-stack to my production work, used as the showcase entry point for the projects above.

- Four crafted pages: immersive WebGL scroll, interactive 3D solar system for projects, parallax mountain with climbing-goat scroll indicator, terminal/CRT contact page with a real command parser.
- Multilingual (EN/FI/SV), comprehensive CSP + security headers, Sentry Core Web Vitals; fully static build, host-agnostic deploy (Vercel, S3+CloudFront, Cloudflare Pages).

Stack: Astro · Three.js · GSAP + ScrollTrigger · Tailwind CSS v4 · TypeScript strict · Sentry · Vercel

github.com/MikkoNumminen/mikkonumminen.dev

ReadLog · Book and audiobook reading tracker

Log books with format and finish date; search your library; "Have I read this?" lookup; public anonymous feed.

- Parallel API integration across Open Library and Google Books with result deduplication.
- 68 tests across 4 suites covering API integrations, server actions, and components.
- Google OAuth sign-in, Neon Postgres, CI with type-check, lint, and full test suite on every push.

Stack: Next.js 16 · React 19 · TypeScript · Prisma 7 · PostgreSQL (Neon) · NextAuth v5 · MUI 7 · Jest · Open Library API · Google Books API

read-log-psi.vercel.app · github.com/MikkoNumminen/ReadLog

AI EVALUATION RESEARCH

Cross-repo calibration study benchmarking Claude Code skill performance across multiple LLM models (Haiku, Sonnet, Opus) and corpora. Methodology: A/B comparison of skill-assisted vs. cold prompting, token consumption measurement, output reliability scoring per model tier. Key finding: smaller models (Haiku) yield the highest percentage token savings but lowest output reliability — establishing a cost-quality frontier for AI-assisted development workflows. Findings published on LinkedIn with substantive technical engagement from the community. Full study and methodology available at mikkonumminen-dev.vercel.app.

WORK EXPERIENCE

Kasvu Labs Oy · Software Developer

2022 – 2024

Full-stack development on Node.js/React with Azure cloud (2 years). Large-scale open data processing, database management, UI design, and product maintenance.

Keijo Numminen Oy, Kesko Oyj, K-Niemi Oy · Senior Salesperson

1998 – 2022

24+ years in customer-facing senior sales roles: training and supervising associates, identifying customer needs, procurement, inventory management, and logistics for both private and professional customers.

EDUCATION & LANGUAGES

Tampere University · Computer Science / Tietotekniikka studies in progress

Finnish (native) • English (professional)