September 2026

VINZENT HUBRICH

PROJECT PORTFOLIO

Software Engineer

hubrich.dev · hubrichv@gmail.com · linkedin.com/in/vinzent-hubrich

Immersive Gaussian Splatting

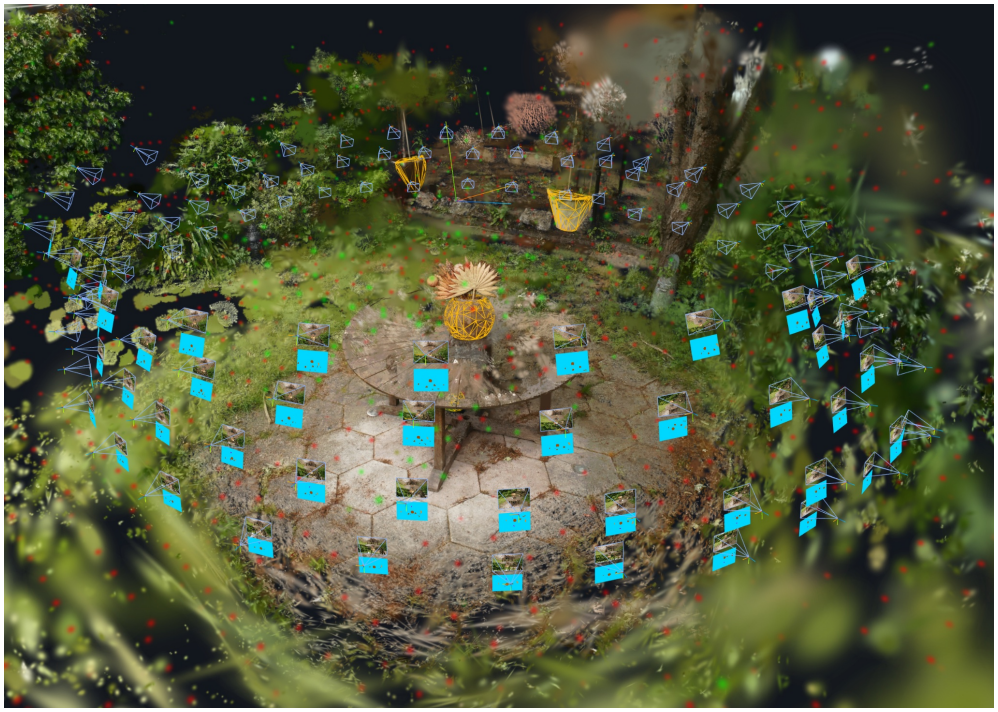
Mixed-reality 3D scanning and reconstruction

Immersive Gaussian Splatting explores a mixed-reality workflow for environment capture, 3D reconstruction, spatial inspection, and asset export. A Meta Quest 3 application captures calibrated RGB frames with camera intrinsics and headset poses, guides the user through setup, capture, and inspection, and renders live reconstruction updates returned by a connected GPU workstation.

The Unity-based Quest application handles camera capture, head-motion checks, WebSocket communication, runtime loading and rendering of Gaussian splats, ray-based segment selection, and local storage of exported assets. Tracking-aware visibility, opacity pruning, fixed foveated rendering, and a 250,000-splat default cap keep the experience practical on standalone hardware.

The Python backend performs semantic segmentation with GroundingDINO and SAM, initializes sparse geometry through SIFT matching and triangulation, and optimizes Gaussians in PyTorch using gsplat. Semantically labeled splats are clustered into selectable object components with Open3D. Selected components are converted through Screened Poisson reconstruction into a binary PLY mesh with a generated UV atlas and PNG texture.

The result is an end-to-end proof of concept: captured frames drive an evolving reconstruction that returns to the headset for live display, spatial inspection, semantic selection, and textured-mesh export. It was developed as a university group project.



FM Connector

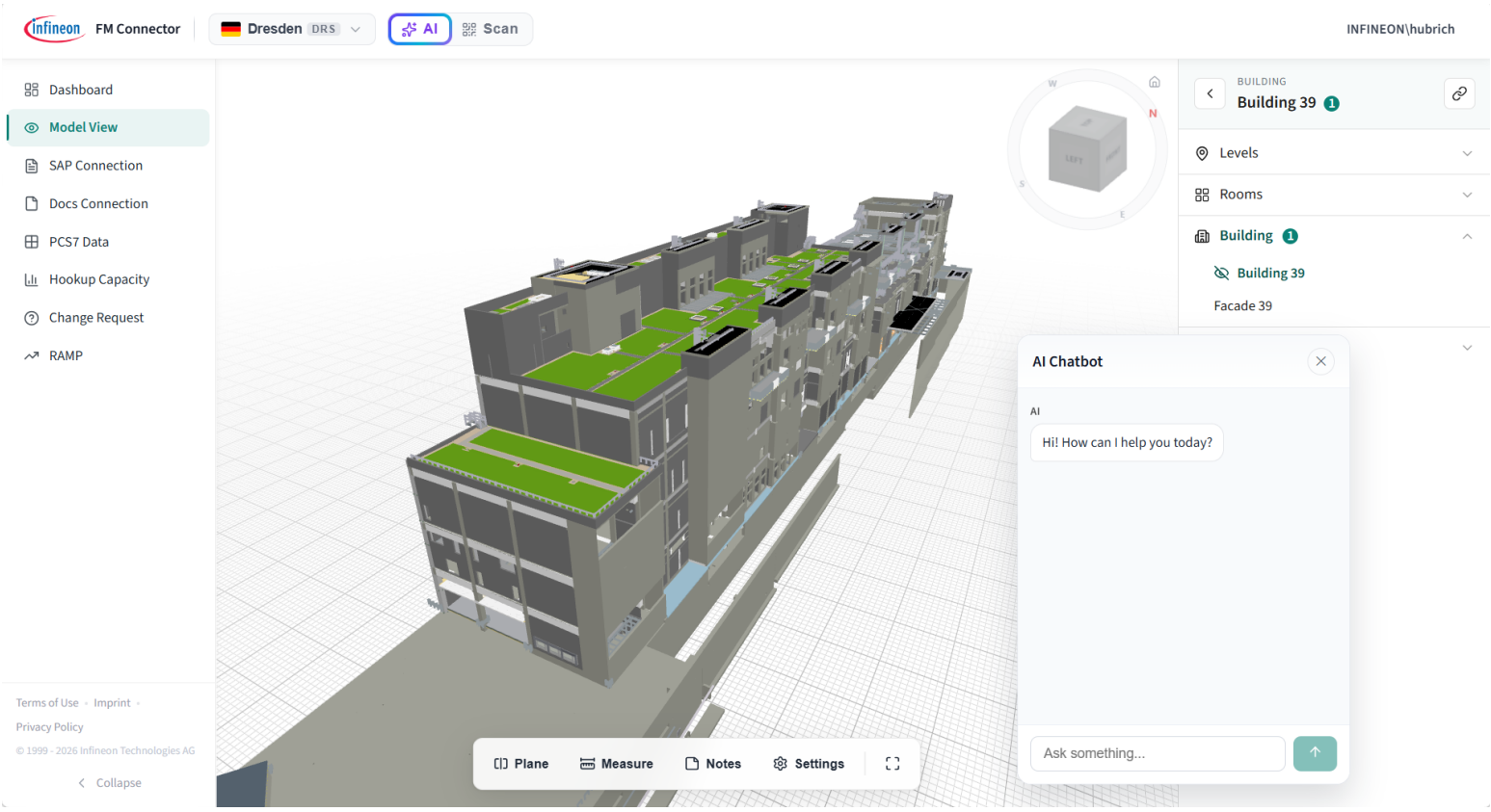
Facility Management made easy

FM Connector is an internal facility management platform developed at Infineon with full ownership from requirements gathering and architecture through implementation and pilot deployment. C#/.NET services and a Vue/TypeScript frontend bring facility information into one interface for facility staff.

The data layer links BIM objects, equipment dependencies, documents, and maintenance information using Oracle Database relational tables and graph storage, with files stored in AWS S3. This supports exploration of relationships across previously fragmented sources.

Large BIM model visualization uses on-demand loading, geometry simplification, instancing, visibility culling, and model preprocessing. Pilot use showed improved load times and navigation responsiveness.

AI-assisted search combines keyword/vector retrieval, graph traversal, contextual filtering, and natural-language generation of SQL and graph queries. Staff can locate equipment information, trace dependencies, and access maintenance records without manually cross-referencing separate tools.



MapMyMiles.app

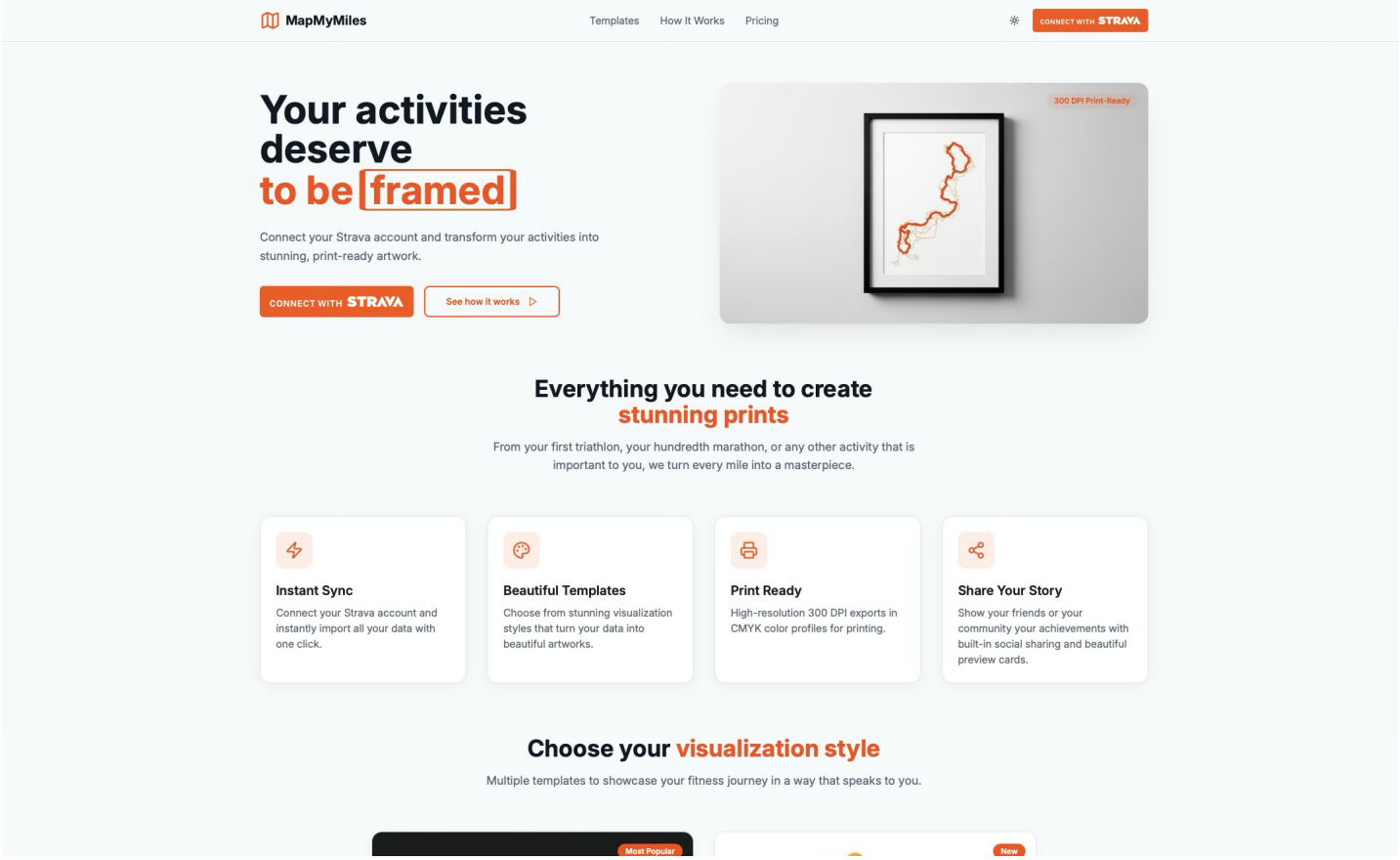
Your activities deserve to be framed

MapMyMiles is a full-stack B2C SaaS platform that transforms personal fitness telemetry into high-resolution, print-ready artwork. By replacing traditional data dashboards with a curated catalog of customizable design templates, the platform enables athletes to convert raw activity data into tangible, aesthetic milestones.

The system is built on a secure OAuth 2.0 pipeline integrated with the Strava API, ensuring a privacy-first approach to sensitive location data and robust token management.

Technically, the project represents complete end-to-end ownership of a sophisticated digital-to-physical pipeline. The architecture features a type-safe backend SDK built on an OpenAPI specification, dynamic canvas rendering for high-fidelity exports, and a conversion-focused checkout flow powered by Stripe.

To ensure high availability and professional-grade reliability, the infrastructure is fully containerized and supports canary deployments for zero-downtime releases, maintaining data integrity and user security throughout the entire product lifecycle.



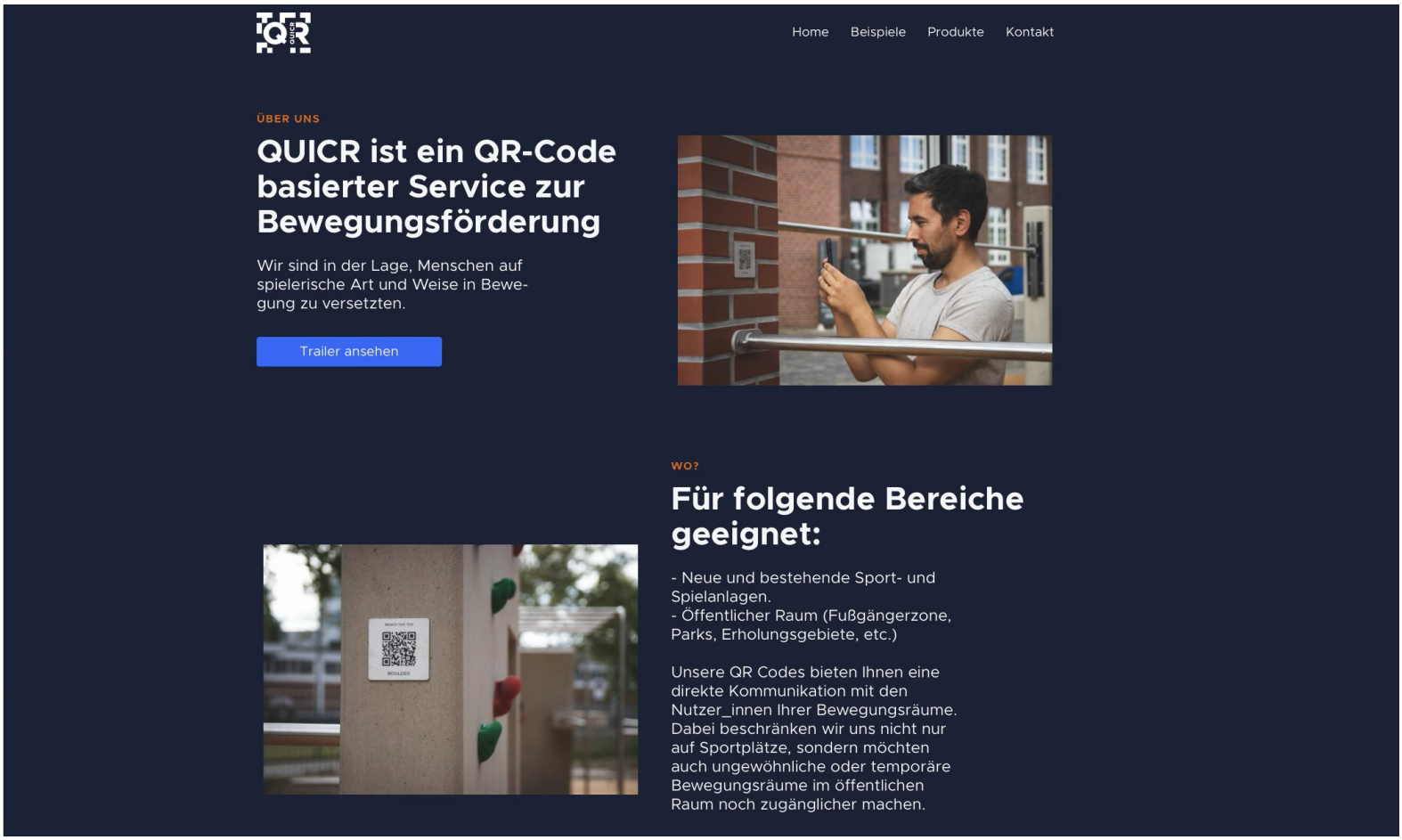
Quicr.eu

QR codes that get you moving

Quicr is a QR-based fitness platform co-founded and launched to support fitness events and activities in public spaces. Municipal partnerships brought the platform into public use, reaching 2,000+ participants and generating approximately €10,000 in revenue.

I held full technical ownership, building the React/TypeScript frontend, backend services, authentication, database structure and access rules, and QR-based challenge and activity flows. Firebase and Google Cloud supported deployment and monitoring.

Participants scan QR markers in public spaces to open browser-based fitness activities without installing an app. The platform connects these physical entry points with the online participation experience.



Podium

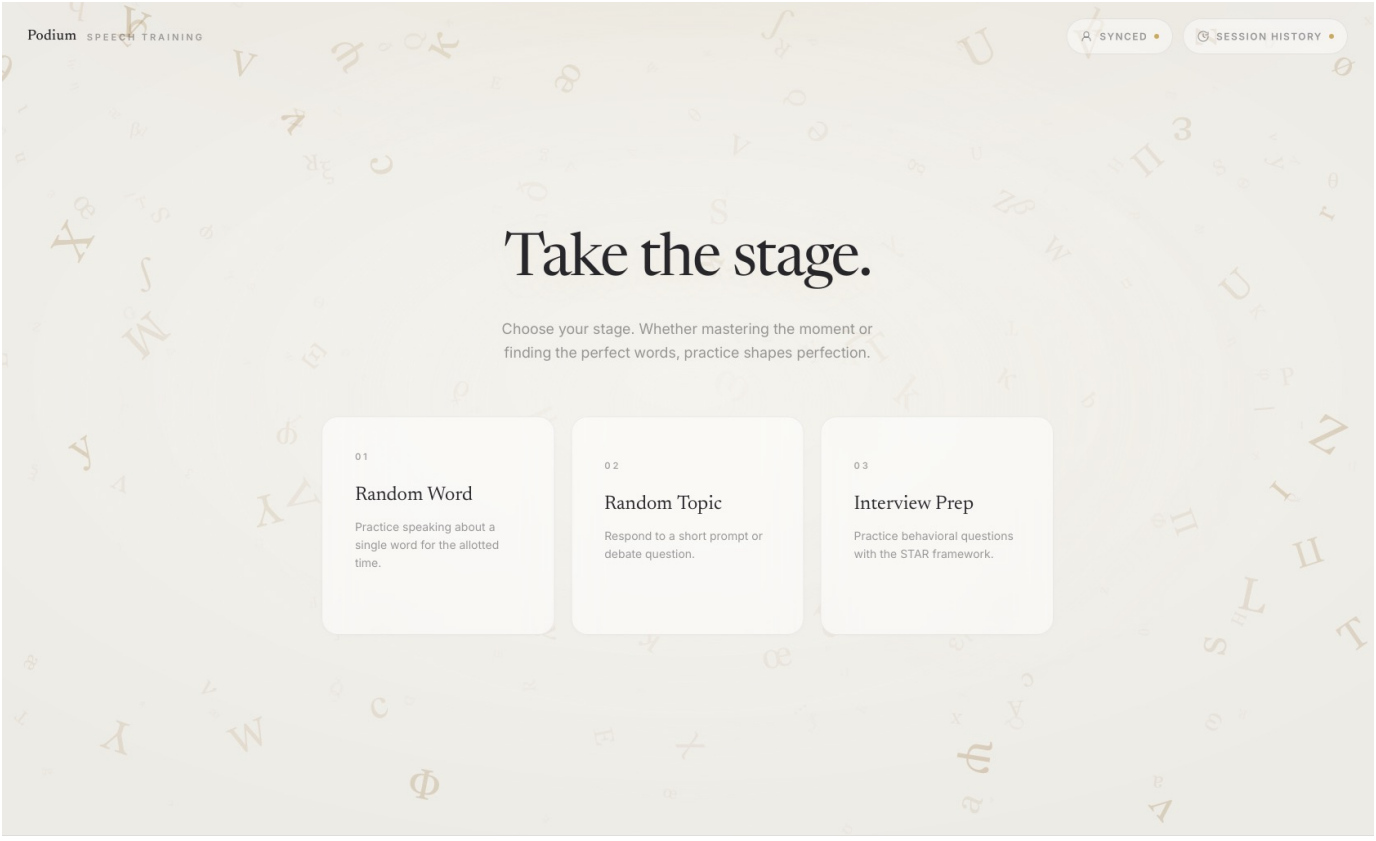
Impromptu speaking practice

Podium turns solo speaking practice into a structured routine with timed prompts, interview drills, optional AI-powered speech analysis, and a session history that makes improvement visible over time. It is fast enough for a two-minute drill before a meeting, but structured enough to support serious interview prep.

Three practice modes - Random Word, Random Topic, and Interview Prep - cover the full range of speaking drills. Interview mode includes built-in STAR guidance and optional follow-up questions. Sessions support an optional preparation window before the timer starts.

With an AssemblyAI API key, Podium records the session, uploads it, and returns a full analysis layer: annotated transcript with filler word highlighting, word count, speaking pace (WPM), transcript confidence score, and an AI-generated performance summary with strengths and focus areas.

Session history tracks up to 500 sessions with aggregate stats - practice time, streaks, average filler percentage, and filler rate per minute - and can be synced across devices via Supabase with passwordless magic-link authentication.



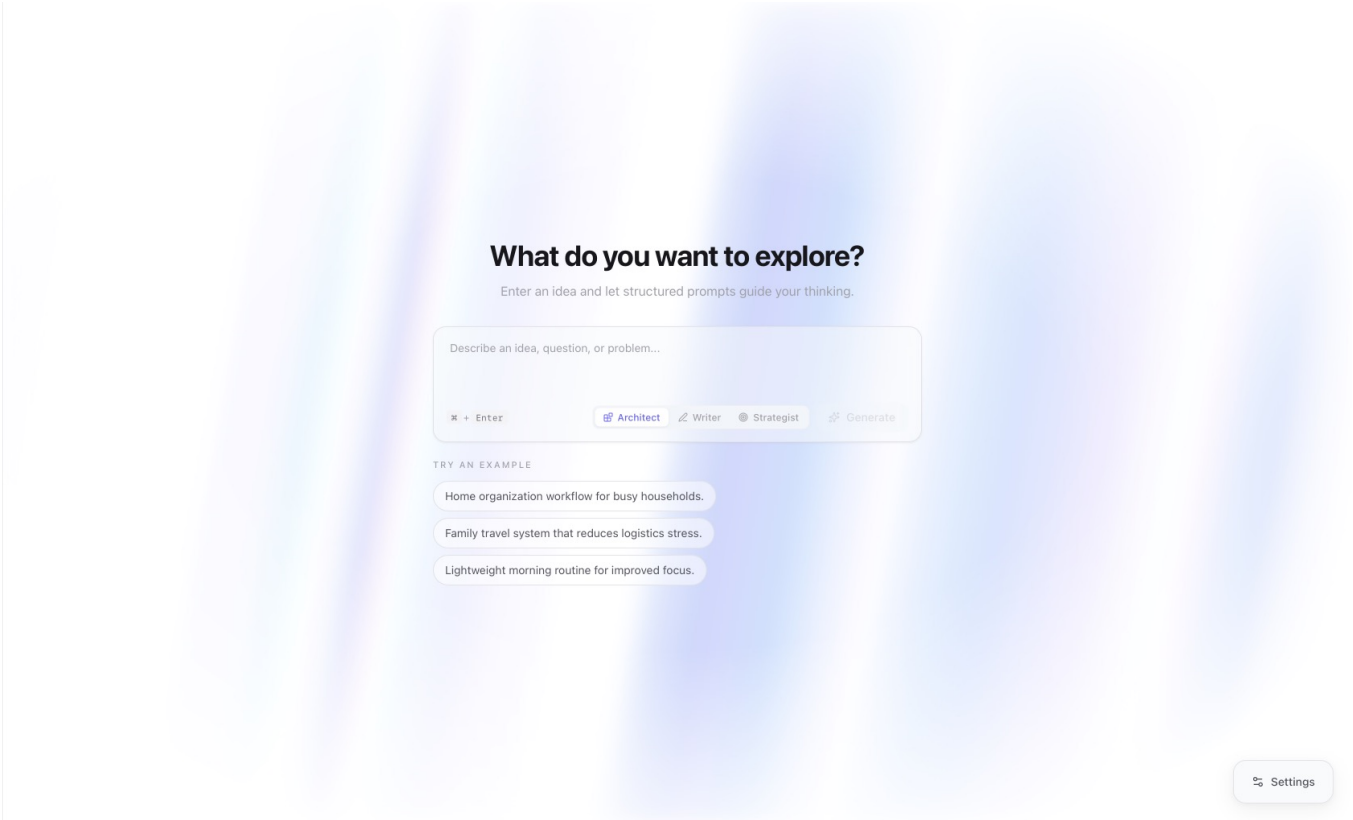
Meridian

Vague idea to clear plan with AI-assisted brainstorming

Meridian is a visual thinking workspace designed to turn vague starting points into structured branches worth pursuing. Starting from a single prompt, the app builds a branching idea tree through iterative exploration: each step generates grouped thematic questions, and committing one selected direction per question group creates a new tree node and advances the branch.

Three exploration personas - Architect, Writer, and Strategist - shape both the prompt structure and the metadata shown for each suggested direction, making the same idea feel different depending on whether you are pressure-testing architecture, refining narrative beats, or mapping execution risk.

The app operates in two modes. In manual mode, Meridian builds the exploration prompt, copies it to the clipboard, and waits for you to paste the LLM response back in. In in-app mode, a saved API key lets Meridian call OpenAI, Gemini, or Anthropic directly from the browser. A visual tree lets you navigate back to any earlier node to inspect or branch again, and the active path can be exported as a persona-shaped PRD-style plan: copy to clipboard, download as Markdown, or save as PDF. The full exploration tree, active node, persona selection, and provider settings persist in browser localStorage with no backend required.



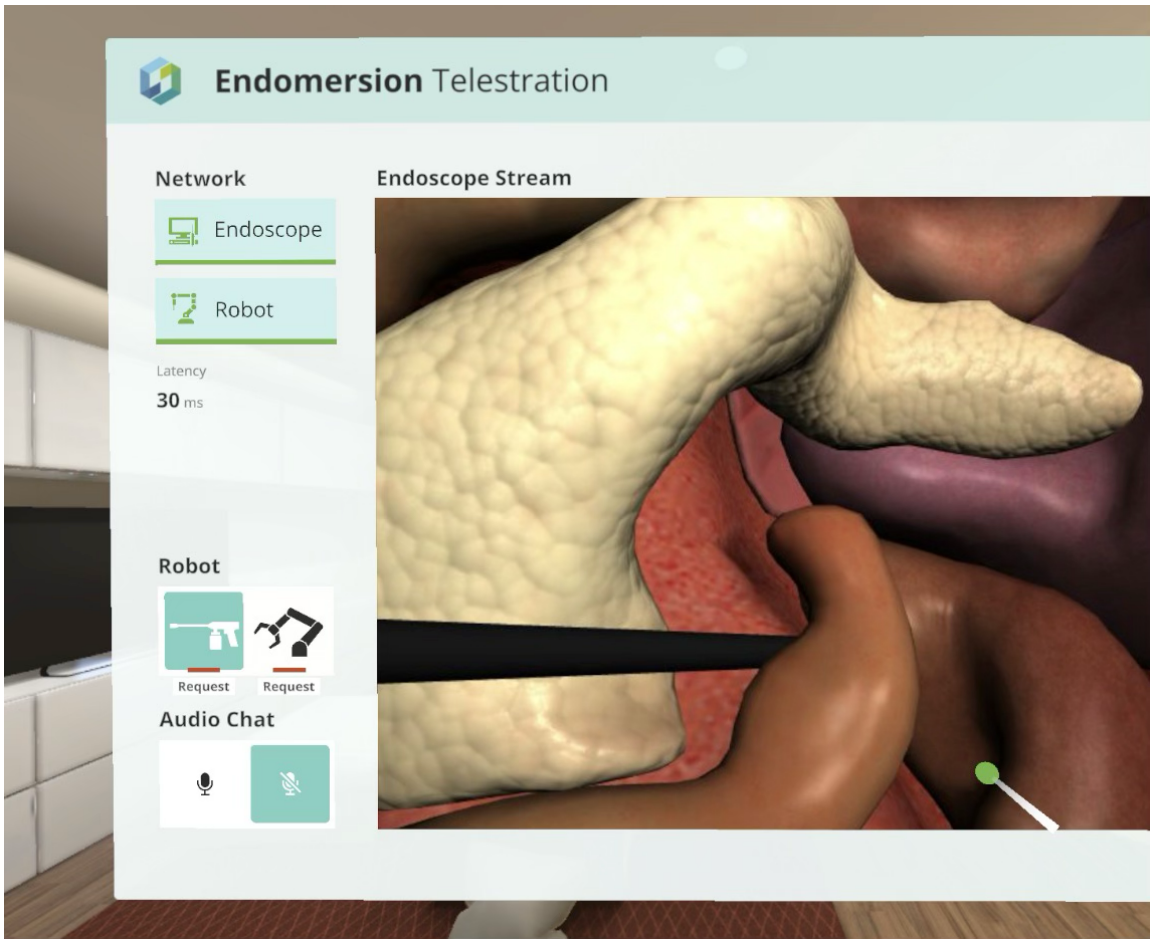
Endomersion

Multi-user control system for surgical robotics

This project upgraded a surgical telementoring platform to support real-time, multi-user collaboration among remote medical experts. Built with Unity and ROS, the architecture synchronizes complex surgical states across VR headsets and PC interfaces with strict low-latency requirements.

Critical was a secure dual-robot control system that allows operators to safely toggle between robot arms. To coordinate distributed inputs, a robust rights management architecture was implemented using a request-response model.

This ensures that only one user holds control privileges at any given time, featuring a strict "Security Mode" for explicit access requests and a hierarchical "Surgery Mode" that allows lead operators to instantly override controls to prevent input conflicts.



Better iOS Calculator

Beyond the basics

Designed as a comprehensive upgrade to the native iOS offering, the "Better iOS Calculator" is a feature-rich, Swift-based application that seamlessly blends intuitive everyday usability with advanced mathematical computing.

Targeting users who need powerful scientific capabilities without sacrificing a clean, modern dark-mode interface, the app reliably handles a wide array of operations. A dynamic interface expands the standard keypad to reveal extended tools, granting quick access to complex trigonometric functions, essential constants, and roots.

Coupled with built-in calculation history and previous answer recall, it ensures that multi-step equations can be managed and solved efficiently within a single, uncluttered workspace.

The standout technical feature is its integrated interactive graphing engine, which eliminates the need to context-switch to secondary apps for visualization. Users can plot mathematical functions directly, utilizing either an inline visual graph docked above the keypad for real-time reference or a comprehensive full-screen mode for detailed analysis of complex curves and asymptotes.