

# Saroz Mitra

## Full-Stack Engineer

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### Professional Summary

Full-stack engineer with 18+ years of experience building production systems across frontend, backend, and cloud infrastructure. Currently building a healthcare AI platform at ARGC - designing a RAG pipeline with hybrid retrieval, multi-layer safety guardrails, caching, and observability, alongside a real-time conversational avatar frontend and Terraform-managed GCP infrastructure. Previously engineered unified e-commerce checkout for Calvin Klein and Tommy Hilfiger across 25 countries. Working daily across Python, Next.js, GCP, and Terraform, delivering complete systems from infrastructure to interface.

### Specialities

Python, FastAPI, Next.js, React, TypeScript, Terraform, GCP, RAG Pipelines, LLM Integration and Testing.

### Key Skills

**AI Engineering:** RAG Pipelines, LLM Integration, vLLM, Ollama, ChromaDB, Langfuse, Guardrails, HuggingFace Embeddings

**Backend:** Python, FastAPI, PostgreSQL, Redis, SQLAlchemy, Node.js, REST APIs, WebSocket

**Frontend:** Next.js, React, TypeScript, Tailwind CSS, Zustand, Storybook, Cypress, Jest

**Cloud & Infrastructure:** Terraform, GCP (Cloud SQL, Cloud Functions, VPC, Secret Manager), Docker, Firebase, CI/CD

**Testing:** Comprehensive knowledge of testing frameworks including Jest, React Testing Library, and Cypress across unit, integration, and end-to-end layers.

**Communication:** Clear communicator with the ability to discuss technical architecture and trade-offs with stakeholders, product managers, and cross-functional teams.

### Work History

#### Full-Stack Engineer (Contract) | ARGC / Blue Door Fertility, London, UK | September 2024 to Present

*Python / FastAPI / ChromaDB / Langfuse / Next.js / TypeScript / React / Zustand / WebRTC / Terraform / GCP / Docker*

Building two connected production systems for a healthcare AI platform: a Python RAG pipeline and a Next.js conversational avatar interface, with supporting GCP infrastructure.

- Designed hybrid retrieval system combining BM25 keyword search and vector similarity via Reciprocal Rank Fusion, with intent-based and treatment-stage boosting.
- Built multi-layer safety guardrails: input validation, output checking, dialog monitoring, medical safety checks, and faithfulness verification.
- Designed two-tier response cache (in-memory L1 + Redis L2), reducing repeat query latency from ~5s to under 10ms.
- Built complete frontend application with custom React hooks, component library, and Zustand state management, supporting dual interaction modes (text chat + video avatar via WebRTC).
- Developed admin dashboard with conversation review, search/filter, PDF export, and analytics views.
- Designed Terraform modules for GCP: VPC networking, Cloud SQL, Cloud Functions, Secret Manager, and IAM - with per-environment configuration (dev/staging/prod).

#### Senior Frontend Developer (Contract) | Experts Circle, London, UK | April 2023 to September 2024

*JavaScript / React / TypeScript / Node.js / AWS Lambda / DynamoDB / Storybook / Jest / Cypress / Terraform*

- Delivered key features for a recruitment platform including job data aggregation, candidate matching, recruiter dashboard, and notification system.
- Led the integration and adoption of testing frameworks (Jest, React Testing Library, Cypress), enhancing code quality and system reliability.
- Developed and implemented a reusable component library using Storybook, streamlining the development process and increasing team efficiency.
- Actively mentored two junior developers, enhancing their technical skills and integration into the development team.

## Senior Frontend Developer (Contract) | Wunderman Thompson Commerce (VML), Watford, UK | September 2019 to March 2023

JavaScript / React / Redux / TypeScript / Next.js / Node.js / Storybook / Adyen / Jest / Cypress / CI/CD / Figma

- Consolidated fragmented per-country checkout codebases into a single unified platform for Calvin Klein and Tommy Hilfiger across 25 countries.
- Integrated Adyen payment gateway - credit/debit cards, PayPal, 3DS1/3DS2 authentication flows.
- Implemented multi-lingual support, dynamic address fields per country, promotions management, and session handling.
- Architected and maintained a reusable React component library using Storybook, standardising development workflows across multiple teams.
- Built comprehensive test coverage across unit (Jest), integration (React Testing Library), and E2E (Cypress) layers.

## Software Engineer (Contract) | Sartorius, Royston, UK | March 2019 to September 2019

HTML5 / CSS3 / JavaScript / React / Redux / TypeScript / Material-UI / Testing / Git / Agile / Python / MongoDB / Azure

- Played a key role in a cross-functional Agile team, developing and refining frontend applications for a clone selection tool used in biotech research.
- Utilised GraphQL APIs to enhance data exchange and application functionality, improving system responsiveness.
- Leveraged the Material-UI framework to deliver intuitive and user-friendly application interfaces.

## UI Developer (Contract) | Barclays, Northampton, UK | September 2018 to December 2018

HTML5 / CSS3 / JavaScript / React / Redux / Testing / Git / Agile

- Developed single-page applications using React.js and Redux for Barclaycard, enhancing user engagement within the financial services sector.
- Conducted comprehensive testing and quality assurance to ensure robustness and performance of financial platforms.
- Collaborated closely with UX designers to refine application layouts, ensuring a seamless user experience meeting financial service standards.

## Senior Frontend Developer | Flixmedia Limited, London, UK | May 2015 to July 2018

HTML5 / CSS3 / JavaScript / React / Vue.js / Angular / Redux / TypeScript / Bootstrap / Testing / Git / Agile

- Developed high-performance e-commerce web solutions for major retail brands, improving functionality and customer conversion rates.
- Introduced and developed a Vue.js single page dashboard application for an in-house product.
- Drove the adoption of progressive web app technologies, enhancing the offline capabilities of e-commerce platforms.
- Mentored junior developers, guiding them through complex project requirements and fostering technical excellence.

## Frontend Developer | BNP Paribas (Cardif Pinnacle Insurance), London, UK | December 2010 to May 2015

HTML5 / CSS3 / JavaScript / jQuery / Responsive Web Design / Testing / Git

- Developed and optimised UI/UX for a range of online financial products, improving accessibility and adherence to W3C standards.
- Implemented responsive web design principles, ensuring seamless functionality across various devices.
- Integrated advanced CSS and JavaScript techniques to improve site load times and performance across critical financial applications.
- Collaborated with backend teams to integrate APIs, ensuring dynamic data retrieval and state management.

## Projects

### ARGC RAG Pipeline

Python, FastAPI, ChromaDB, vLLM, Ollama, Langfuse, Redis, PostgreSQL, Docker

- Designed hybrid retrieval - BM25 + vector search with Reciprocal Rank Fusion, intent and treatment-stage boosting
- Built multi-layer guardrails: input safety, output validation, medical safety, faithfulness checking
- Designed two-tier caching (L1 in-memory + L2 Redis) - reduced repeat query latency from ~5s to under 10ms
- Integrated Langfuse for full request tracing with per-stage spans and confidence scoring

Outcome: Production system serving real patients at an IVF clinic.

### ASHA - AI Fertility Assistant

Next.js 14, TypeScript, React, WebRTC, WebSocket, Firebase, Python, Terraform, GCP

- Built entire frontend with custom React hooks, component library, and Zustand state management
- Implemented dual interaction modes: text chat with streaming, video mode with voice capture and avatar lip-sync
- Designed Terraform infrastructure: VPC, Cloud SQL, Cloud Functions, Secret Manager, IAM across 3 environments
- Built admin dashboard with conversation viewer, search/filter, PDF transcript export, analytics

Outcome: Live production app serving IVF patients with dual interaction modes.

## **PVH Unified Checkout**

*Next.js, React, TypeScript, Redux Toolkit, Storybook, Node.js, Adyen, Cypress*

- Consolidated per-country checkout into single unified platform serving both brands across 25 countries
- Integrated Adyen payment gateway - credit/debit, PayPal, 3DS1/3DS2 authentication flows
- Implemented multi-lingual support, dynamic address fields, promotions management
- Built component design system with Storybook for UI consistency across brands and countries

*Outcome: Unified checkout live across 25 countries for Calvin Klein and Tommy Hilfiger.*

### **Education**

Bachelor of Computer Applications (BCA)

Bangalore University, Bangalore, India - 2000 to 2004

### **Reference**

Available upon request