MRINAL SHARMA

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EDUCATION

University of Notre Dame *Notre Dame, IN*
M.S. in Computer Science & Engineering *Jan 2026*
Served as a TA from 15th Aug, 2024 - Dec 31st, 2025

Vellore Institute of Technology *Vellore, India*
B.Tech in Computer Science & Engineering *2020 - 2024*

PROJECTS

NeighborDrive - AI-Powered Car Rental Platform Next.js, AWS S3, CloudFront, Google Gemini
· Reduced image load latency by **60%** by architecting a scalable storage pipeline using **AWS S3** for asset hosting and **CloudFront CDN** for global caching.
· Engineered an automated damage detection system using **Google Gemini Multimodal**, processing vehicle inspection photos to identify vehicular damage with **90%+ accuracy**.
· Secured peer-to-peer payments and identity verification by integrating **Stripe Connect** and **NextAuth.js v5**, facilitating safe transactions for users while maintaining PCI compliance.

InsightEngine - GenAI Business Intelligence Tool Next.js, Vercel AI SDK, PostgreSQL, Recharts
· Developed a natural language interface for database querying using the **Vercel AI SDK** and **GeminiAI**, achieving a **95% success rate** in generating valid, complex SQL queries.
· Accelerated data reporting workflows by **40%** through a dynamic frontend that instantly converts raw SQL results into interactive charts using **Recharts** and **PapaParse**.
· Optimized large-scale data handling by implementing **Prisma** with connection pooling, ensuring stable performance during complex multi-table join operations.

DevFlow - Real-time Collaborative Code Editor Next.js, Node.js, WebSockets, Monaco Editor
· Achieved **sub-30ms** synchronization latency for concurrent users by engineering a custom **WebSocket (ws)** server utilizing Operational Transformation algorithms.
· Integrated the **Monaco Editor** (VS Code core) to support syntax highlighting and intellisense for 10+ languages, mirroring a desktop IDE experience in the browser.
· Deployed a scalable **Monorepo** architecture to isolate the high-throughput WebSocket server from the Next.js client, streamlining CI/CD pipelines and independent scaling.

PulseCheck - Kubernetes Health Dashboard Kubernetes, Python, Next.js, Docker
· Engineered a full-stack Kubernetes monitoring dashboard serving **real-time visibility** into cluster health across **3+ resource types (nodes, pods, metrics)**, reducing manual monitoring overhead by eliminating the need for CLI tools in **80%** of common monitoring tasks
· Built scalable real-time data pipeline with FastAPI backend and Next.js frontend updating metrics **every 5 seconds**, enabling **sub-second anomaly detection** for **100+ concurrent pod observations**.
· Integrated Kubernetes Python Client with dual-protocol support (REST + metrics.k8s.io API) to aggregate pod, node, and resource metrics from live clusters, supporting unlimited cluster scales with <**2s query latency**.

PROFESSIONAL EXPERIENCE

Software Engineering Intern Notre Dame, IN
RecruitMate (Next.js, Typescipt, Prisma, Tailwind) *Aug 2024 - May 2025*
· Improved Time to Interactive by **380ms** by removing unnecessary animation libraries, reducing JavaScript payload by **15KB**.
· Designed Prisma schema supporting 200+ universities across 12 athletic conferences in **sub-50ms** query response times. Reduced CSS code duplication by **60%** through Tailwind utility-first design patterns, eliminating **200+** lines of redundant styling.
· Optimized image rendering across **40+** components using Next.js Image, reducing bundle size by **28%**. Achieved **95+** Lighthouse performance score across all metrics.

TECHNICAL SKILLS

Languages	TypeScript, JavaScript , Java, Python, C++, SQL
Frontend	Next.js, React , Tailwind CSS
Backend	Node.js, Express.js, WebSockets (ws), Prisma ORM, PostgreSQL, MongoDB, CI/CD
Cloud & AI	AWS , Kubernetes, Docker, Vercel AI SDK, Google Gemini
Tools	Git, Postman, Monorepo Architecture, Prometheus, Grafana