

Devendra Sai Mupparaju

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SUMMARY

AI engineer with a Master's in Computer Science from Iowa State who bridges deep LLM research with hands-on product shipping. My graduate research on activation steering raised CodeLlama-7B accuracy on HumanEval from 48% to 56% and brought invalid code output down to zero, without retraining the model. On the product side, I have shipped a 5-agent job application system, a Gemini Vision browser agent, an autonomous Instagram content pipeline, and a Reddit game that holds 3,000+ concurrent players at 60 FPS. I do my best work when the job is turning AI capabilities into real products people actually use.

EDUCATION

Iowa State University

Ames, IA

Master of Science in Computer Science, GPA 3.5/4.0

Aug. 2023 – Dec. 2025

- Focus: Artificial Intelligence, Machine Learning, System Architecture.
- Creative Component: *Automatic Program Repair Through Activation Steering* (advisor: Prof. Simanta Mitra).

SRM University Amaravati

Amaravati, India

Bachelor of Technology in Computer Science and Engineering, GPA 7.8/10

Aug. 2019 – May 2023

EXPERIENCE

Software Engineer

May 2026 – Present

VelocitiPM

Remote

- Rebuilt new-user onboarding end to end across a 3-repo React / FastAPI / Supabase stack: simplified the registration page, redesigned welcome and tour modals, and introduced a new app shell (Header, Sidebar, SidebarToggleIcon) that lifted layout logic out of the dashboard page; 27 files and roughly 2.5K lines in a single feature push.
- Wired Cloudflare Turnstile captcha into sign-up, sign-in, and password-reset flows, with an env-flag bypass so captcha gracefully no-ops in local development without changing the underlying signUp/signIn call signature.
- Polished the workspace switcher so it hides and fades when the sidebar collapses, suppresses the “New workspace” CTA in the collapsed state, and routes users to a cleaner first-run view after creating a workspace.
- Stood up the full local dev environment using Docker Compose for the FastAPI + LangGraph agents backend, and used the Supabase CLI to keep the local Postgres schema in sync with the remote project.

RESEARCH EXPERIENCE

Graduate Researcher: Activation Steering for Automatic Program Repair

Aug. 2025 – Dec. 2025

Iowa State University (advisor: Prof. Simanta Mitra)

Ames, IA

- Designed a training-free activation steering method in PyTorch that lifted CodeLlama-7B accuracy on HumanEval from 48.12% to 56.25% (+8.13pp) and drove invalid (non-compiling) output from 4.38% down to 0%, with no model retraining required.
- Reproduced the gain on Qwen2.5-Coder-7B (63.12% to 70.00%) and on Qwen2.5-Coder-14B against Defects4J's 565 real-world Java bugs (60.88% to 65.31%), confirming the technique generalizes across model families and benchmarks.
- Ran 40+ layer/strength configurations on a Slurm HPC cluster using PyTorch forward hooks on residual streams; surfaced a novel finding that middle transformer layers are optimal for generation tasks while late layers are optimal for repair, hinting at task-dependent reasoning stages inside CodeLLMs.

Graduate Researcher: Secure Deep Learning & Federated Learning

Jan. 2025 – May 2025

Iowa State University

Ames, IA

- Built ML training loops inside Intel SGX enclaves in C++ on the Darknet framework, with AES-GCM-encrypted model weights for secure import/export; measured a ~50% overhead (27.43s vs. 41.07s) deemed acceptable for privacy-critical workloads.
- Formally verified a 3-client federated learning protocol in NuSMV using CTL temporal logic, mathematically proving starvation-freedom, deadlock-freedom, eventual fairness across all clients, and bounded round completion.

PROJECTS

Autonomous Job Application Agent System

- Built a 5-agent pipeline that handles the full job application lifecycle: an Apify-based scout pulls roles from LinkedIn / Indeed / Glassdoor with relevance scoring and dedupe, while an analyzer scrapes Greenhouse and Lever forms and uses Gemini to classify every field by category.
- A writer agent tailors a cover letter, elevator pitch, and “why this company” answer per role; an answerer fills every unique form question from a structured candidate profile; a submitter drives Claude-in-Chrome to fill forms and pause for human confirmation before sending.
- Layered on parallel systems: a Gmail IMAP watcher that parses Glassdoor recommendation emails into Notion, a 60-second resume tailoring loop that ATS-scores and re-renders the PDF per JD, and a React + Firebase Kanban board with real-time Firestore sync for tracking.

AI Social Media Generator (The Social Speaker)

[View on GitHub](#)

- Built an autonomous content engine that researches trending topics via Perplexity, drafts narrative-driven copy with Gemini, generates 1080×1080 dark-mode Instagram carousels with Imagen 3 + Pillow, and publishes directly through instagrapi with no paid publishing APIs and no external hosting.
- Designed a self-refilling topic queue, scheduled daily runs through Windows Task Scheduler, and wired Discord webhook notifications on every successful publish for at-a-glance health checks.

Portfolio Website with AI Assistant

[View on Website](#)

- Shipped a production portfolio featuring a first-person AI chatbot that answers recruiter questions about skills, projects, and work authorization using a prompt-engineered Gemini agent with a 2.5-Pro to 2.5-Flash to 1.5-Flash fallback chain for reliability.
- Layered per-interaction analytics logging, a “Bridge Technique” for gracefully handling unknown questions, and a Resend-powered contact form so qualified inbound conversations land directly in my inbox.

UI Navigator Agent

[View on GitHub](#)

- Built a universal web-navigation agent that accepts voice or text commands and autonomously interacts with any website by pairing Gemini Vision with Set-of-Mark element tagging and Playwright-driven browser automation, working across arbitrary sites without per-site selectors.

Bounce Streak

[View on GitHub](#)

- Shipped a competitive soccer-themed 2D physics game on Reddit’s Devvit platform that has sustained 3,000+ concurrent users at a steady 60 FPS, with daily randomized physics modifiers and seed-based RNG so every player faces identical conditions each day.

GrocerySquare

[View on GitHub](#)

- Built a production-grade grocery storefront with a glassmorphism UI and full product catalog, statically generated for 20+ pages via `generateStaticParams` and continuously deployed to GitHub Pages via GitHub Actions, with a local mock-data fallback so the app runs without DB access during development.

TECHNICAL SKILLS

Languages: Python, C/C++, TypeScript, JavaScript, SQL, Bash

AI / ML: PyTorch, TensorFlow, Scikit-learn, LLM Integration, Prompt Engineering, Activation Steering, RAG Architecture, Vector Databases (pgvector), Embeddings, Agentic Workflow Design, Multi-Agent Systems, Gemini API, OpenAI API, Vercel AI SDK

Web & Frameworks: React, Next.js, Node.js, Flask, Tailwind CSS, Vite, Framer Motion, Phaser 3, Shadcn UI

Cloud & DevOps: AWS (EC2, S3, IAM), Docker, Docker Compose, GitHub Actions, CI/CD, Slurm (HPC), Intel SGX, Firebase, Vercel

Databases & APIs: PostgreSQL, Supabase, MySQL, Redis, pgvector, Notion API, Gmail IMAP, Apify, Resend, Cloudflare Turnstile

CERTIFICATIONS

- Google Cloud: Prompt Design in Vertex AI (Feb 2026)
- Oracle: Cloud Infrastructure Foundations Associate (2021)
- HackerRank: Python (Basic)