

# Portfolio

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**Hi,  
I'm Parth Nitin Patil  
Developer**

Generative AI, LLM & Tech Enthusiast

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## About

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# Portfolio

Third year Computer Engineering student building practical AI systems—RAG pipelines, LLM tooling, and computer vision workflows. I care about shipping reliable, secure features with clear interfaces.

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Projects like Code Debugger, MCP Server, DocuMind AI, and a YOLOv8 trash detector sharpened my skills in Python/OpenCV, JavaScript, C/C++/Java, and backend orchestration.

## Skills

### Technical Skills

Here are the technologies and tools I work with:

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## Projects

### Code Debugger

Developed a local code execution and debugging tool with automated language detection (C, C++, Python, Java) using regex-based heuristics. Implemented sandboxed execution flow with subprocess calls for safe compilation and execution. Built evaluation module comparing program output against test cases with helpful debugging feedback.

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### MCP Server

Built and customized an MCP (Model Context Protocol) server using AI tools for iterative development. Adapted and integrated modules for routing, middleware, and authentication. Learned to evaluate and refactor AI-generated code for improved readability and maintainability across multiple server components.

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## Robotic Trash Collector

Built a deep learning-based system using YOLOv8 to detect floating waste (plastic bottles, cans, cups). Achieved 80%+ precision on Kaggle-based dataset. Integrated Python + OpenCV for real-time video processing and tracking with modular architecture supporting autonomous navigation and solar-powered operation.

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## DocuMind AI

An RAG-based system that sorts files in the backend by upload date and serves AI responses on the frontend. Includes admin UI for managing documents and a user UI for querying and retrieving context-aware answers.

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