

# SIDDHARTH SINGH

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Technology Researcher with 4+ years of experience building Agentic AI solutions using LLMs, semantic search, and scalable web frameworks.

## Technical Skills

|                           |   |
|---------------------------|---|
| Backend & APIs            | FastAPI, Django, Django REST Framework, SQLAlchemy, SqlAdmin                          |
| Frontend                  | Angular JS, Chainlit, Gradio, Bootstrap   |
| Database                  | PostgreSQL  |
| Authentication & Security | Keycloak  |
| AI & Agentic Frameworks   | CrewAI, LangChain, LangGraph, OpenAI SDK  |
| GenAI & LLM Techniques    | Agentic AI, Retrieval-Augmented Generation (RAG), Semantic Search, Prompt Engineering |
| Machine Learning & NLP    | Natural Language Processing (NLP), Machine Learning, Deep Learning                    |
| Data Analytics & BI       | Power BI, Tableau, Microsoft Excel  |

## Experience

May 2024 - PRESENT

### TATA CONSULTANCY SERVICES, Bengaluru – Researcher

- Designed and developed **intelligent, scalable software solutions** leveraging **AI, data engineering, and modern web architectures** to solve complex business problems.
- Currently developing an **Agentic AI application** integrating **Large Language Models (LLMs)** with a **custom semantic knowledge engine**, enabling users to query uploaded documents via a context-aware chatbot interface.
- Implemented **document parsing, chunking, embedding, and indexing pipelines**, using **cosine similarity-based semantic search** to retrieve the most relevant knowledge instead of passing entire documents to the LLM, improving efficiency and response quality.
- Architected a **secure, full-stack system** using **FastAPI, Django, PostgreSQL, and AngularJS**, ensuring modular APIs, role-based access control, and a smooth user experience.
- Applied **Retrieval-Augmented Generation (RAG)** techniques and experimented with **embeddings and semantic search strategies** to enhance accuracy, reduce hallucinations, and improve system performance.
- Previously contributed to the **Patent Analytics Tool (PAT)**, a platform enabling organizations to analyze large volumes of patent data for **R&D strategy, competitive intelligence, and IP management**.
- Enhanced **patent search, classification recommendations, and strategic reporting features**, supporting identification of emerging technology trends and innovation opportunities.
- Strengthened **application performance, security, and compliance** through bug fixes, deployment support, and **IP Safe Assessments**, ensuring enterprise-grade reliability.
- Authored **architecture documentation and user guides**, enabling smoother adoption and effective knowledge transfer across teams.

Aug 2021 – April 2024

### TATA CONSULTANCY SERVICES, Bengaluru – System Engineer

- Supported **infrastructure monitoring and operations** using **SolarWinds and NewRelic**, ensuring system stability and operational readiness.
- Played a key role in a **data-driven transformation initiative** for a leading retail client, addressing the challenge of analyzing **65,000+ monthly alerts** to improve IT operational efficiency.
- Drove the **adoption of Power BI** for alert analytics and reporting, replacing manual workflows and reducing analysis time from **hours to minutes**.
- Built and maintained a **centralized data repository** integrated with Power BI, improving data accuracy and eliminating repetitive data-cleaning efforts.
- Developed **interactive dashboards** delivering actionable insights for stakeholders, including a comprehensive operational dashboard for **Starbucks**, supporting faster decision-making and improved system reliability.

## Projects

### [CodeSmith AI – Autonomous AI Developer](#) - [Python | CrewAI | OpenAI | Agentic AI | Docker | Prompt Engineering]

- Designed and developed an **autonomous AI coding assistant** that plans, generates, executes, and evaluates code from natural language instructions using **multi-agent orchestration**.
- Implemented **CrewAI-based agent workflows** to coordinate task understanding, code generation, execution, and result validation, producing **structured, human-readable outputs**.

- Integrated **containerized code execution using Docker**, enabling **secure, isolated, and reproducible runtime environments** for safe evaluation of generated programs.
- Built a **JSON-based response framework** returning generated code, execution results, logs, and metadata to support downstream automation and analysis.
- Enabled **dynamic multi-language execution** (currently optimized for Python) with safety controls such as **runtime limits and automated retry mechanisms** to handle failures gracefully.
- Enhanced developer experience by implementing a **Rich-powered terminal UI** with syntax highlighting and structured output visualization.

#### [Deep Research Analysis – AI-Powered Research Orchestrator](#) – [Python | OpenAI SDK | Agentic AI | Async Processing | Gradio | Prompt Engineering]

- Designed and developed an **AI-driven research orchestration system** that automates end-to-end topic exploration, content synthesis, and report generation using **multiple asynchronous agents**.
- Implemented an **agent-based pipeline** to perform web research, summarize findings, and synthesize insights into a **structured Markdown report**, reducing manual research effort significantly.
- Built an **interactive Gradio interface** enabling users to trigger deep research workflows and visualize intermediate and final outputs in a clean, user-friendly UI.
- Orchestrated **asynchronous task execution** to improve throughput and responsiveness while coordinating search, analysis, and report generation stages.
- Automated **report delivery via email**, enabling seamless sharing of finalized research outputs without manual intervention.

#### [StockPicker AI - Intelligent Investment Research Assistant](#) - [Python | Agentic AI | Multi-Agent Systems | OpenAI SDK | Async Workflows | Prompt Engineering]

- Designed and built an **autonomous, multi-agent investment research system** that identifies trending companies, performs deep financial analysis, and delivers **personalized investment recommendations**.
- Implemented **intelligent company discovery pipelines** to analyze market news, earnings reports, and sector trends while ensuring **non-repetitive, unbiased selections**.
- Developed **deep financial analysis workflows** evaluating fundamentals, financial ratios, competitive positioning, management quality, growth potential, and risk factors.
- Engineered a **deep financial analysis workflow** combining quantitative and qualitative criteria, providing transparent rationale for top picks and exclusion decisions.
- Orchestrated **7 specialized AI agents** with sequential task execution and context passing to ensure coherent analysis across discovery, evaluation, and recommendation stages.
- Automated **multi-channel reporting**, delivering executive-style email summaries and real-time mobile notifications via PushOver with consistent messaging.

## Certifications

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## Education

Aug 2017 – July 2021

**Visvesvaraya Technological University, Belagavi** - *Bachelor of Engineering (Computer Science & Engineering)*