Master Thesis - "Microservice-Aware AI Code Assistant Using Locally Hosted Large Language Models" (30 credits/20 weeks – 2 students)

About us

GKN Aerospace is the world's leading multi-technology tier 1 aerospace supplier. With 33 manufacturing locations in 12 countries, we serve over 90% of the world's aircraft and engine manufacturers. We design and manufacture innovative smart aerospace systems and components. Our technologies are used in aircraft ranging from the most used civil aircraft to the world's advanced 5th generation fighter aircraft and the Ariane orbital rockets used by ESA.

Project Background

Modern enterprises often rely on a large ecosystem of microservices to support software development. While these microservices are well-documented, integrating them into new applications remains time-consuming, as developers must repeatedly consult documentation and manually write boilerplate integration code. Cloud-based AI coding assistants such as GitHub Copilot and Cursor AI have demonstrated potential in improving developer productivity, but they raise concerns around privacy, data leakage, and reliance on third-party services.

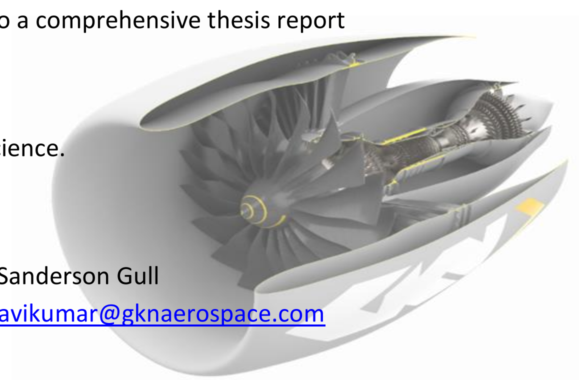
An emerging alternative is the use of locally hosted large language models (LLMs), which can be fine-tuned or augmented with enterprise-specific knowledge to generate context-aware code. By combining LLMs with retrieval-augmented generation (RAG) and microservice-aware architectures, developers could receive accurate, domain-specific coding assistance directly within their development environment.

Assignment Description

- Familiarize with the Topic and Make a Detailed Plan of the Project.
- Ingest organizational microservice documentation into a vector database.
- Use retrieval-augmented generation (RAG) or smaller helper LLMs to enhance the local LLM's understanding of available services.
- Provide developers with context-specific code completions and integration snippets in Python, JavaScript, and Typescript. Test and validate the performance of the system.
- Compare two approaches for providing AI-assisted code: an extension in an open-source IDE (such as Theia) and a standalone CLI tool. The selected solution will then be implemented and evaluated against four key metrics: developer productivity, response latency, code accuracy, and ease of adoption.
- Compare the effectiveness of this approach with traditional documentation-driven workflows in terms of accuracy, developer productivity, and feasibility of running AI assistants entirely on-premises.
- Compile all research, design, implementation, and testing findings into a comprehensive thesis report

Qualifications

Student in the final year of their M.Sc. studies in the field of Computer/Data Science.



Apply by

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