ResearchMind: An Intelligent Research Assistant for Academic Researchers

# 1. Introduction

With the rise in academic publications and research demands, students and early-stage researchers often face difficulty in navigating scholarly resources, managing literature, understanding research methodology, and avoiding plagiarism.

# 2. Problem Statement

Despite the availability of vast academic resources, students in higher education lack a unified, intelligent system to assist them in literature review, topic exploration, plagiarism checking, and academic writing guidance. This leads to inefficient research workflows, delayed progress, and subpar quality of submissions.

# 3. Objectives of the Solution

The main goals our solution aims to achieve are:

* Assist in topic selection and idea refinement.
* Enable semantic search of scholarly articles.
* Support research methodology and formatting.
* Provide real-time plagiarism checks.
* Generate formatted research drafts.

# 4. Proposed Solution

We propose ResearchMind, an AI-powered web-based assistant that integrates advanced NLP, Retrieval-Augmented Generation (RAG), and document parsing capabilities to support students throughout their academic research lifecycle. It provides semantic search over research articles, intelligent Q&A, auto-generated research drafts, and plagiarism analysis—streamlining the entire research process within a single interface.

# 5. System Overview

The system consists of:  
- A React frontend for user interaction.  
- A Node.js backend for managing user sessions, search queries, and integration.  
- A Python-based RAG service that retrieves relevant scholarly documents using FAISS or Qdrant and generates answers using LLMs like Ollama or Gemini.  
- A plagiarism detection module powered by open-source APIs or LLM-based semantic comparison.

# 6. Expected Outcomes

* Reduce time taken for literature survey by 60–70%.
* Improve quality and originality of student research.
* Enable guided research even without faculty supervision.
* Create a scalable, reusable tool for educational institutions.

# 7. Conclusion

ResearchMind addresses a critical need in the academic ecosystem by empowering students with AI-driven support, thereby enhancing the quality, speed, and integrity of their research outputs. It serves as both a productivity tool and a learning platform.