DESIGN AND DEVELOPMENT OF AI AGENTS FOR ACADEMIC PROJECT PLANNING AND MANAGEMENT

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ABSTRACT

Academic projects are a vital part of engineering and higher education curricula, enabling students to apply theoretical knowledge to real-world problems. However, many students face key challenges such as inadequate planning, inefficient task allocation, lack of collaboration, and insufficient research guidance. This project aims to tackle these issues by designing and developing AI agents that assist students throughout the academic project lifecycle, improving efficiency, organization, and research outcomes.

INTRODUCTION

Academic projects are a fundamental component of higher education curricula, enabling students to apply theoretical knowledge to practical and real-world problems while developing essential skills such as problem-solving, teamwork, innovation, and decision-making. However, students often face challenges such as research problems, project planning, task allocation, progress monitoring, and resource management. Fragmented tools and lack of structured guidance further complicate the process. This project proposes an AI-driven system to address these challenges effectively.

IMPLEMENTATION

The implementation setup includes:

- Python 3.9 for backend logic and AI integration
- Streamlit for front-end dashboards and user interaction
- MongoDB for storing user data, projects, tasks, and documents
- FastAPI for asynchronous and synchronous API handling
- Bootstrap for modern and responsive UI design
- SMTP for email notifications, alerts, and reminders

OBJECTIVES

1. Collect and summarize relevant academic research information.
2. Plan projects with structured timelines, milestones, and suitable methodologies.
3. Break down goals into tasks, allocate team members, and track progress in real time.
4. Facilitate collaboration and manage resources through communication hubs and repositories.
5. Generate structured document and provide AI-driven evaluation and feedback.

METHODOLOGY / SYSTEM ARCHITECTURE
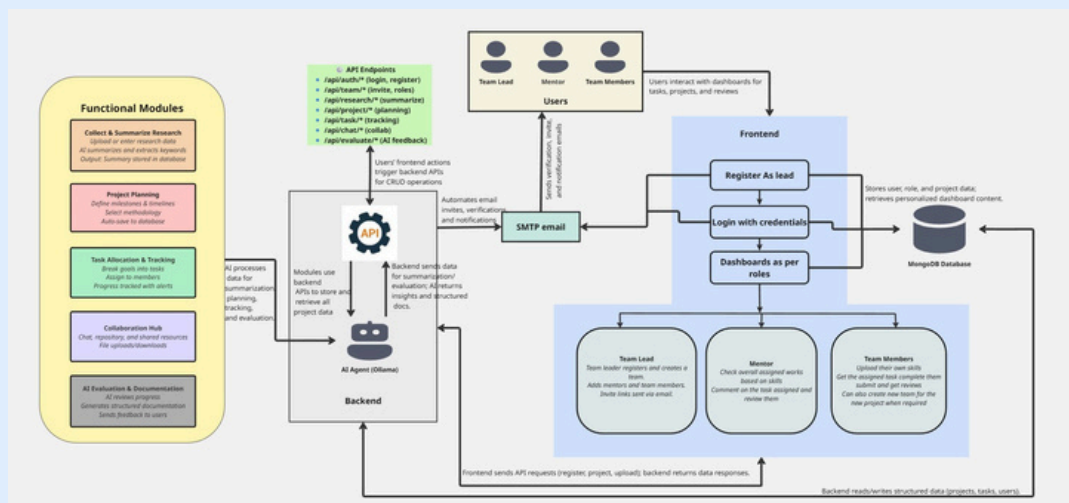
- Modular, AI-driven system for academic project planning and management.
- Architecture supports research summarization, task allocation, collaboration, and documentation.
- End-to-end workflow from user registration to project evaluation.
- Built using Python, Streamlit, MongoDB, and SMTP for notifications.
- AI/NLP models (LLMs) enable intelligent recommendations, progress tracking, and evaluation.

CONCLUSION

The integration of AI into academic project planning and management improves efficiency, collaboration, and learning outcomes. By automating repetitive tasks and providing intelligent assistance, the system helps students manage projects more effectively. This approach enhances project coordination, documentation quality, and overall academic performance.

FUTURE SCOPE

- Predictive analytics for identifying project risks
- Integration with Learning Management Systems (LMS)
- Industry-oriented project workflows
- Advanced AI models for evaluation and feedback

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