

Knight Foundation School of Computing and Information Sciences

Spring 2024 Senior Design Project

Material Atlas for Coastal Construction

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PROBLEM

Building off the groundwork laid by previous efforts, our team is addressing the persistent challenge of limited collaboration between material scientists and engineers/architects through the development of a comprehensive knowledge-sharing platform. While previous iterations have made strides in this direction, there remains a critical need for enhancements in key areas such as data extraction, security, and user interface design. By leveraging advancements in artificial intelligence and prioritizing security and user experience, our team aims to bridge the gap between material science and allied disciplines, fostering a culture of collaboration and knowledge sharing.

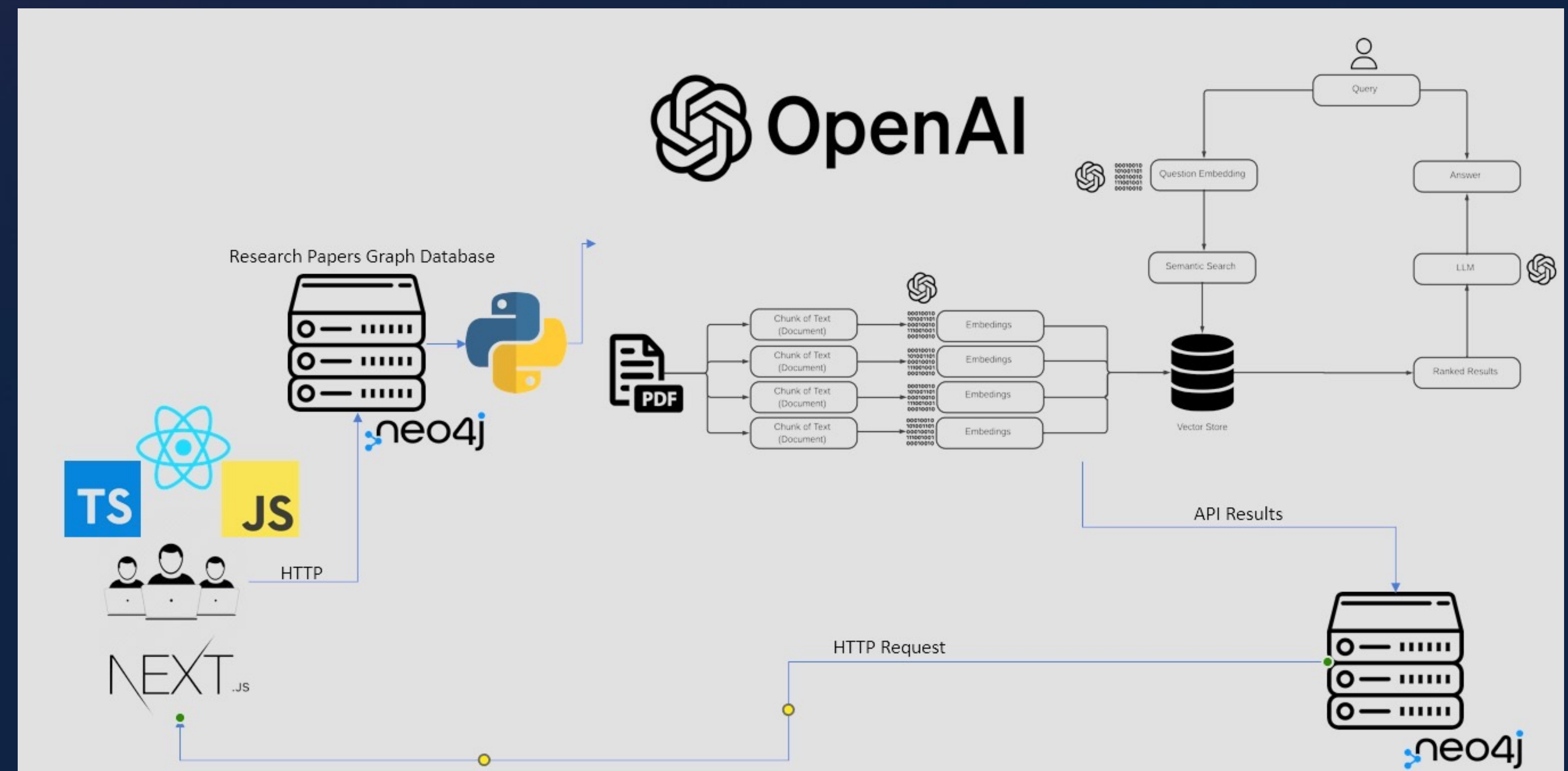
CURRENT SYSTEM

The project was delivered in the early stages of development with a clear structure for further development, focusing on expanding the database, refining the user interface, and enhancing the system's overall capabilities for future research and application in the field of coastal construction. The team established the first generation of a system designed to innovate and define research direction in coastal construction materials.

REQUIREMENTS

- **Data Extraction and Analysis:** Implement AI models to extract material data from research papers, including mix tables, properties, and strength.
- **User Authentication and Security:** Develop secure registration and login functionalities to protect user data and maintain platform integrity.
- **User Interface Design:** Build on current UI for the Material Atlas website, ensuring ease of navigation and accessibility for all users.

SYSTEM DESIGN



SUMMARY

Building upon the initial framework of the "Material Atlas for Coastal Construction," our team at the Knight Foundation School of Computing and Information Sciences, Florida International University, has taken significant strides in enhancing the collaboration between material scientists and engineers. Our current iteration focuses on the advancement of a comprehensive knowledge-sharing platform. We have placed particular emphasis on data extraction and analysis, harnessing artificial intelligence to extract material data from research papers effectively. Additionally, we have prioritized user experience and security, ensuring that user data is safeguarded. Through these enhancements, we aim to bridge the gap between material science and practical application, cultivating a culture of knowledge sharing that is pivotal for the sustainable development of coastal communities.

ACKNOWLEDGEMENT

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