

Knight Foundation School of Computing and Information Sciences

Spring 2024 Senior Design Project

Material Atlas for Coastal Construction

Students: Chris Daniel Lantigua, Sejal Nathu-Hari, Cesar Barrios, Giovanni Ruiz

Mentor: Lyla Wu

Instructor/Faculty: Dr. Masoud Sadjadi, PhD, Florida International University

PROBLEM

Expanding upon the groundwork established by prior initiatives, our team is tackling the persistent issue of limited cooperation between material scientists and engineers/architects by crafting an extensive knowledge-sharing platform. While past endeavors have made progress in this direction, there's a pressing need for improvements in critical areas like data extraction, security, and user interface design. Through harnessing advancements in artificial intelligence and giving precedence to security and user experience, our team seeks to narrow the divide between material science and related fields, nurturing a collaborative ethos and information exchange. This platform not only streamlines communication and collaboration but also empowers users with AI-generated insights, enriching their decision-making prowess. Moreover, robust security protocols will be in place to safeguard intellectual property and confidential data, fostering confidence among users and promoting wider adoption within scientific and engineering communities.

CURRENT SYSTEM

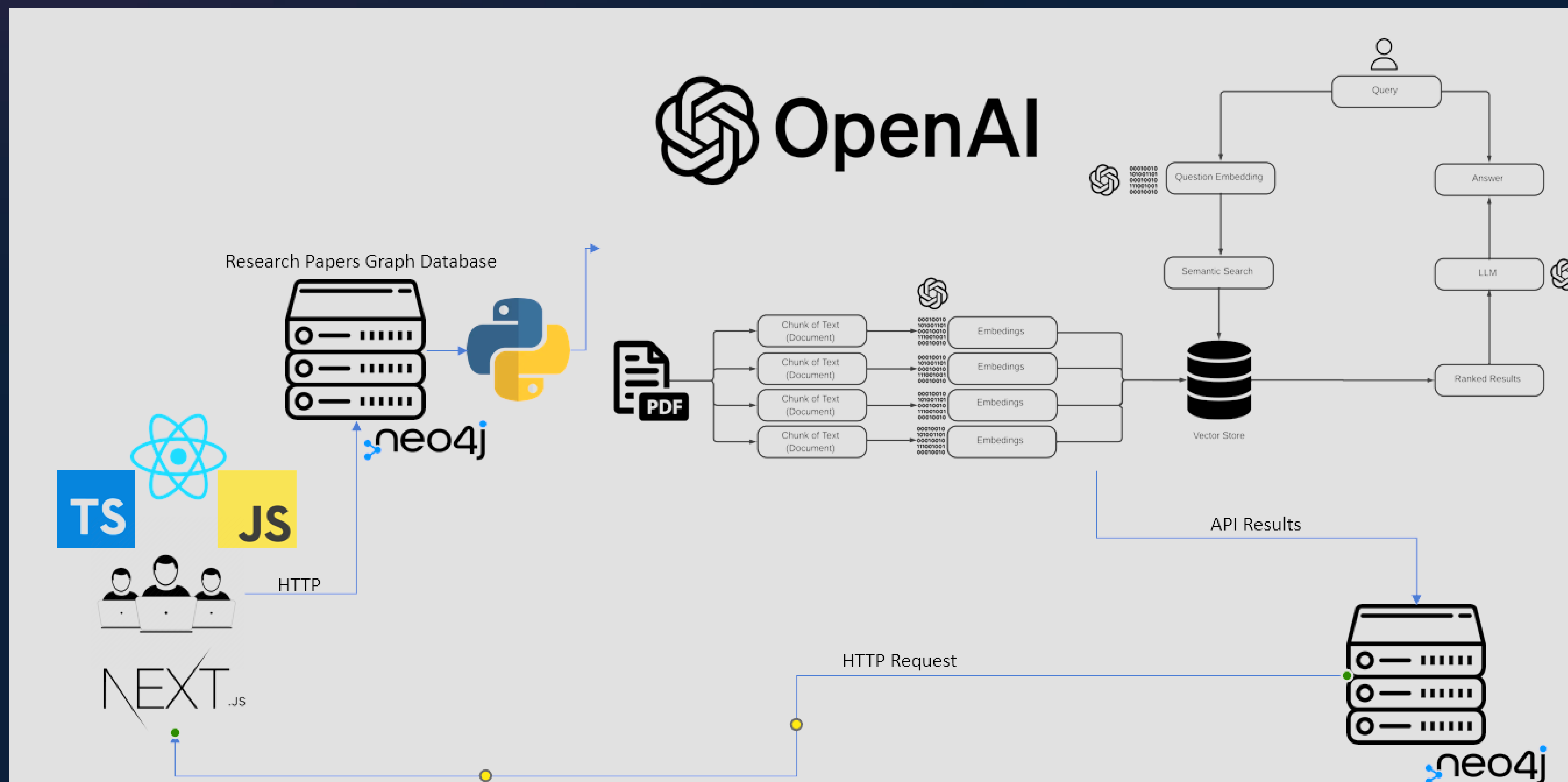
In its nascent stages, the project was unveiled with a comprehensive roadmap for ongoing evolution, strategically prioritizing the augmentation of the database, refinement of the user interface, and fortification of the system's capabilities to meet the demands of future research endeavors and practical applications in the realm of coastal construction. This initial release marks a significant milestone as the team pioneers the inception of a cutting-edge system, poised not only to innovate within the field but also to shape the trajectory of research and development in coastal construction materials.

REQUIREMENTS

- **Data Extraction and Analysis:** By leveraging AI models, the platform will automate the extraction of essential material data from research papers. This includes extracting mix tables, properties, and strength information, thereby significantly expediting the research process and enhancing efficiency.
- **User Authentication and Security:** Ensuring the protection of user data and platform integrity is paramount. Hence, robust registration and login functionalities will be developed, employing stringent security measures to safeguard sensitive information and maintain user trust.
- **User Interface Design:** Improving the user experience is a key focus. Building upon the current UI of the Material Atlas website, the aim is to create an intuitive interface that ensures easy navigation and accessibility for users of all backgrounds and expertise levels, thereby fostering greater engagement and collaboration within the community.

SUMMARY

Building upon the foundational work established by the "Material Atlas for Coastal Construction," our team at the Knight Foundation School of Computing and Information Sciences, Florida International University, has made significant strides in fostering collaboration between material scientists and engineers. Our current focus centers on advancing a comprehensive knowledge-sharing platform, with a particular emphasis on enhancing data extraction and analysis capabilities. Leveraging artificial intelligence, we aim to streamline the process of extracting material data from research papers efficiently. Moreover, we have placed a strong emphasis on prioritizing user experience and security. By ensuring robust security measures, we aim to safeguard user data and maintain platform integrity. Through these enhancements, our overarching goal is to bridge the gap between material science and practical application, fostering a culture of knowledge sharing and collaboration within the scientific and engineering communities.



ACKNOWLEDGEMENT

The material presented in this poster is based upon the work supported by Dr. Masoud Sadjadi. We/I thank Lyla Wu for his/her/their assistance and mentorship that I/we received throughout the senior design project.