

Semester Project Proposal – Application Project

General Information

Project Name:	Data Management for the construction industry
Type of project:	IDP / Application Project / Guided Research
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Research or Business Problem

Currently, managing GIS data for the construction industry is a challenge. Many problems are being solved with manual processes and out-of-system knowledge. Learning from geo information has become a priority in the construction industry to optimize tender processes. Therefore, this project aims to create a system for managing and querying geo information, timeseries data, and property information for construction and real estate management.

Research Questions

1. How can we leverage geoinformation to identify suitable properties for construction projects?
2. How well does LLM fine-tuning work for information retrieval from a mixed type database for geospatial data?

Related Work / Research Background / Existing Solutions

In the dynamic landscape of modern industry, the role of an Industrial Hall Project Developer is pivotal. This professional is responsible for conceptualizing, designing, and overseeing the construction of industrial halls, ensuring they meet the unique needs of clients across various sectors.

Expertise and Responsibilities:

An Industrial Hall Project Developer possesses a diverse skill set. They begin by conducting comprehensive site assessments to determine the feasibility and suitability of a location for an industrial hall. This involves evaluating factors such as transportation access, utility infrastructure, zoning regulations, and environmental considerations.

Once a site is selected, the developer collaborates with architects and engineers to create a customized design that maximizes space utilization, energy efficiency, and functionality.

They consider aspects like load-bearing capacity, climate control, safety measures, and future expansion possibilities.

During the construction phase, the developer oversees project timelines, budgets, and quality control, ensuring that the project stays on track and meets or exceeds client expectations. This may involve coordinating with contractors, suppliers, and regulatory agencies to secure permits and approvals.

Innovation and Sustainability:

In recent years, sustainability has become a significant focus in industrial hall development. An adept Industrial Hall Project Developer integrates eco-friendly solutions such as renewable energy sources, efficient insulation, and rainwater harvesting systems into their projects, aligning with global efforts to reduce the carbon footprint of industrial operations.

Conclusion:

In a world where industry is constantly evolving, the Industrial Hall Project Developer plays a crucial role in shaping the physical infrastructure that supports it. With expertise in site selection, design, construction management, sustainability, and client satisfaction, these professionals are instrumental in driving economic growth, facilitating commerce, and ensuring a sustainable industrial future. Their dedication to innovation and problem-solving is a testament to their role as visionary builders of the industrial world.

Required Technical Background

Applicants should have a background in data engineering or systems design for machine learning applications. As the application should be container based, basic Docker and/or Kubernetes knowledge is desired.

The system involves a front- and backend. As such, the applicant should be familiar with modern frontend frameworks such as React, Vue.js, or Django. As a backend Python, a GIS database of choice, and PyTorch will be the target.

Please also apply if only parts if you only meet parts of the desired skills!

Other Relevant Information

Data collection needed	No, data available
Interactive UI required	Yes
Key Technologies to Use	Python, PyTorch, (No)SQL, React, Vue.js
Group Work possible	Yes, if academic regulations allow
Industry-related project	Yes, data & domain expertise provided by industry partner

Application Details

If you are interested in applying for this project, please send an email to Herbert.woisetschlaeger@tum.de. The email subject must start with [SEMESTER PROJECT - Data Management for the construction industry]. Please include a brief statement of motivation, your current transcript of records, and your CV.

In your statement of motivation, please refer to projects you have done earlier that are related to core requirements of this project proposal and why the topic is relevant to you.