Proposal: GIS-Powered Natural Language Query System

Course: DSCI 551 - Foundations of Data Science
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Date: February 6, 2025

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Project Abstract - This proposal presents a **GIS-powered natural language query system** that integrates **PostGIS** and **LLMs** to allow users to retrieve geospatial data using natural language queries. The system translates user queries into **optimized SQL statements** that efficiently interact with a GIS database, enabling users to ask spatial questions such as **"Where are the nearest electric vehicle charging stations?"** or **"Find all Chinese restaurants within 5 km of my location."**. The project leverages **LLM-based query processing, spatial indexing, and GIS visualization tools** to enhance accessibility and usability of geospatial data.

Keywords: GIS, LLM, PostGIS, Natural Language Queries, Spatial Database, Geospatial Search, Route Optimization, OpenStreetMap, API Development, Spatial Indexing, Machine Learning, Location-Based Services