CS490 Senior Design

Project Proposal

MyMapper

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1. Problem statement:

For our senior design project, we will design and implement an application to model geographic location of various points of interests in real time. The application will be different from other similar projects because it will use a distributed in-memory database system in its backend, making the transactions very efficient and safe for big data. Additionally, we will bring dynamic moving objects data into the map and query out the information of not only static POI (Point-of-Interest-Type) but also moving objects.

2. Objectives:

We propose a real time street map application based on distributed database system that will:
i) store our map and object data in distributed database system. In this project, we will use *SPARK* as an in-memory cluster database framework and populated with locations provided by the *OpenStreetMap*.
ii) be able to answer queries that find POI within a given area.
iii) be able to answer queries that continuously find moving objects within a given area and also keeping track of the total number of objects within the area.
iv) be able to answer queries that continuously find the k-nearest POI for a stationary or moving object.
v) have a web based user interface to ensure usability and deliverability.
vi) create an ingester (a script that runs frequently, inserting into the database all current locations of dynamic objects. It keeps the position of the moving actors (busses, police cars, etc.) up to date. This data is not pulled from actual real-world objects, but will be faked to serve as a proof-of-concept.) that will mock real time data of a large number of moving objects on a map and insert it into the database.

3. Stakeholders:

i) The software developers (Developer)
ii) Users of our application, such as drivers, travelers (Users)
iii) Professor Walid G. Aref (Project Owner)
iv) Alina Nesen (Project Manager)

4. Deliverables:

i) Related documentations including Design Document, Requirements Document, Project Plan, etc.
ii) A web application which has the capability to answer queries stated in the objective

section.

iii) A SPARK structured distributed database that stores all the object attributes in real time