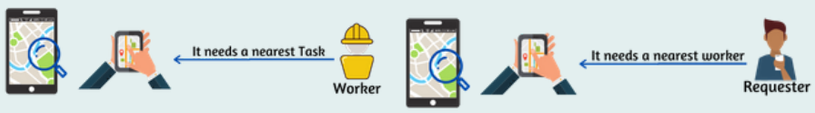
Spatial index in Big Data Crowdsourcing

Shahd Qari, Leena Houmaidan, Ashwaq Almalki, Manal Alharthi, Raghad Alqurashi
Supervisor. Dr. Louai Alarabi
Computer Sciences Department, Umm Al-Qura University, 2021

Abstract:

With the recent developments in the geographical information system and spatial computing, people can take part in some of the nearby online tasks. Spatial Computing provides a very important computing technology for any geographically related applications and services. In This study, we are going to investigate two main components of spatial crowdsourcing. In particular, we will introduce spatial indexes to a crowdsourcing platform Next, we will construct two basic spatial operations of crowdsourcing applications. We will conduct an experimental study to recommend the suitable big data framework and the subtitle spatial indexing for crowdsourcing applications



Research Objective:

- Build basic spatial crowdsourcing operations of :
  1. spatial top-K nearest neighbor Query
  2. Geotag spatial range query.
- Discover the best recommendation in a big distributed streaming platform for spatial crowdsourcing applications.
- Run extensive experiments on our project data structures and operation.

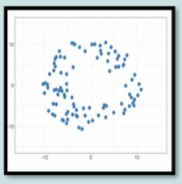
Related Work:

- could not determine if the worker was near to the task.

Data Collection:

we use the gMission Spatial Crowdsourcing DataGenerator is an open-source platform we use it to generate our dataset by using Synthetic Data; the data was used based on the Saudi Arabia border's coordinates

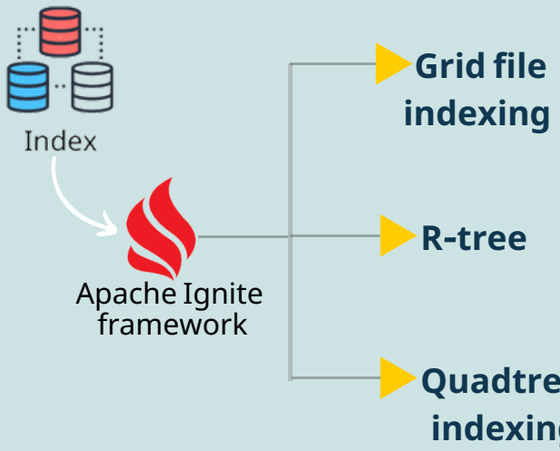
gMission SCDataGenerator



Synthetic Data

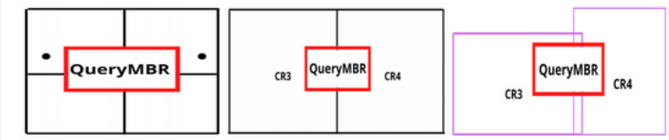
Coordinates of Saudi Arabia

Methodology:



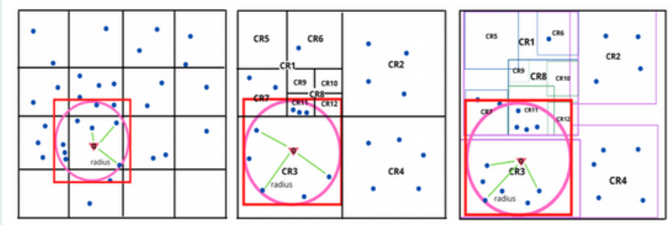
Operation:

- Geotag spatial range query



(a) Grid file index (b) Quadtree index (c) R-tree index

- Spatial top-k nearest neighbor query



(a) Grid file index (b) Quadtree index (c) R-tree index

Development tools:

Java

apache Ignite

QGIS

Conclusion:

In this study We demonstrated two main components of spatial crowdsourcing. In particular, we introduced spatial indexes to the crowdsourcing platform. And We will conducted an experimental study to recommend a suitable big data framework and suitable spatial indexing for crowdsourcing applications.

Contact:

Group email: csgroup23.2021@gmail.com
Supervisor email: Lmarabi@uqu.edu.sa

Reference: