**Privacy-Preserving Aggregate Queries for Optimal Location Selection**

**Abstract:**

Today, vast amounts of location data are collected by various service providers. The location data owners have a good idea of where their customers are most of the time. Other businesses also want to use this information for location analytics, such as ﬁnding the optimal location for a new branch. However, location data owners cannot directly share their data with other businesses, mainly due to privacy and legal concerns. In this paper, we propose privacy-preserving solutions in which location-based queries can be executed and answered by location data owners without sharing their data with other businesses and without accessing the customer list of the businesses that send the query. We utilize a partially homomorphic cryptosystem as the building block of the proposed protocols. We prove the security of the protocols in semi-honest threat model. We also explain how to achieve differential privacy in the proposed protocols and discuss its impact on utility. We evaluate the performance of the protocols with real and synthetic datasets and show that the proposed solutions are highly practical. The proposed solutions will facilitate the sharing of sensitive data between entities in a wide range of applications without violating their customers’ privacy.

**SYSTEM REQUIREMENTS:**

**HARDWARE REQUIREMENTS:**

* System : Pentium Dual Core.
* Hard Disk : 120 GB.
* Monitor : 15’’ LED
* Input Devices : Keyboard, Mouse
* Ram : 1 GB

**SOFTWARE REQUIREMENTS:**

* Operating system : Windows XP/UBUNTU.
* Implementation : NS2
* NS2 Version : 2.28
* Front End : OTCL (Object Oriented Tool Command  Language)
* Tool : Cygwin (To simulate in Windows OS)