**Preserving Location Privacy in Geosocial Applications**

**ABSTRACT:**

Using geosocial applications, such as FourSquare, millions of people interact with their surroundings through their friends and their recommendations. Without adequate privacy protection, however, these systems can be easily misused, for example, to track users or target them for home invasion. In this paper, we introduce LocX, a novel alternative that provides significantly improvedlocation privacy without adding uncertainty into query results or relying on strong assumptions about server security. Our key insight is to apply secure user-specific, distance-preserving coordinate transformations to all location data shared with the server. The friends of a user share this user’s secrets so they can apply the same transformation. This allows all location queries to be evaluated correctly by the server, but our privacy mechanisms guarantee that servers are unable to see or infer the actual location data from the transformed data or from the data access. We show that LocX provides privacy even against a powerful adversary model, and we use prototype measurements to show that it provides privacy with very little performance overhead, making it suitable for today’s mobile devices.

**SYSTEM ANALYSIS**

**EXISTING SYSTEM:**

Existing systems have mainly taken three approaches to improving user privacy in geosocial systems:

* Introducing uncertainty or error into location data.
* Relying on trusted servers or intermediaries to apply anonymization to user identities and private data.
* Relying on heavy-weight cryptographic or private information retrieval (PIR) techniques.

None of them, however, have proven successful on current application platforms. Techniques using the first approach fall short because they require both users and application providers to introduce uncertainty into their data, which degrades the quality of application results returned to the user. In this approach, there is a fundamental tradeoff between the amount of error introduced into the time or location domain, and the amount of privacy granted to the user. Users dislike the loss of accuracy in results, and application providers have a natural disincentive to hide user data from themselves, which reduces their ability to monetize the data. The second approach relies on the trusted proxies or servers in the system to protect user privacy. This is a risky assumption, since private data can be exposed by either software bugs and configuration errors at the trusted servers or by malicious administrators. Finally, relying on heavy-weight cryptographic mechanisms to obtain provable privacy guarantees are too expensive to deploy on mobile devices and even on the servers in answering queries such as nearest neighbor and range queries.

**DISADVANTAGES OF EXISTING SYSTEM:**

* Location data privacy. The servers should not be able to view the content of data stored at a location.
* This new functionality comes with significantly increased risks to personal privacy.

**PROPOSED SYSTEM:**

In this paper, we propose LocX(short for location to index mapping), a novel approach to achieving user privacy while maintaining full accuracy in location-based social applications (LBSAs from here on ward). Our insight is that many services do not need to resolve distance-based queries between arbitrary pairs of users, but only between friends interested in each other’s locations and data. Thus, we can partition location data based on users’ social groups, and then perform transformations on the location coordinates before storing them on untrusted servers. A user knows the transformation keys of all her friends, allowing her to transform her query into the virtual coordinate system that her friends use. Our coordinate transformations preserve distance metrics, allowing an application server to perform both point and nearest-neighbor queries correctly on transformed data. However, the transformation is secure, in that transformed values cannot be easily associated with real-world locations without a secret, which is only available to the members of the social group. Finally, transformations are efficient, in that they incur minimal overhead on the LBSAs. This makes the applications built on LocX lightweight and suitable for running on today’s mobile devices.

**ADVANTAGES OF PROPOSED SYSTEM:**

* Our goal is to support both query types in an efficient fashion, suitable for today’s mobile devices.
* Flexibility to support point, circular range, and nearest-neighbor queries on location data.
* Strong location privacy. The servers processing the data (and the administrators of these servers) should not be able to learn the history of locations that a user has visited.

**System Specification**

**System Requirements:**

**Hardware Requirements:**

* System : Pentium IV 2.4 GHz.
* Hard Disk : 40 GB.
* Floppy Drive : 1.44 Mb.
* Monitor : 15 VGA Colour.
* Mouse : Sony.
* Ram : 512 Mb.

**Software Requirements:**

* Operating system : Windows XP.
* Coding Language : ASP.Net with C#
* Data Base : SQL Server 2005.