PROFILR: Toward Preserving Privacy and Functionality in Geosocial Networks

Abstract—Profit is the main participation incentive for social network providers. Its reliance on user profiles, built from a wealth of voluntarily revealed personal information, exposes users to a variety of privacy vulnerabilities. In this paper, we propose to take first steps toward addressing the conflict between profit and privacy in geosocial networks. We introduce PROFILR, a framework for constructing location centric profiles (LCPs), aggregates built over the profiles of users that have visited discrete locations (i.e., venues). PROFILR endows users with strong privacy guarantees and providers with correctness assurances. In addition to a venue centric approach, we propose a decentralized solution for computing real time LCP snapshots over the profiles of colocated users. An Android implementation shows that PROFILR is efficient; the end-to-end overhead is small even under strong privacy and correctness assurances.

Existing System

ONLINE social networks have become a significant source of personal information. Their users voluntarily reveal a wealth of personal data, including age, gender, contact information, preferences and status updates. A recent addition to this space, geosocial networks (GSNs) such as Yelp and Foursquare further collect fine grained location information, through check-ins performed by users at visited venues. Overtly, personal information allows GSN providers to offer a variety of applications, including personalized recommendations and targeted advertising, and venue owners to promote their businesses through spatio-temporal incentives, e.g., rewarding frequent customers through accumulated badges. Providing personal information exposes however users to significant risks, as social networks have been shown to leak and even sell user data to third parties. There exists therefore a conflict. Without privacy people may be reluctant to use geosocial networks; without user information the provider and venues cannot support applications and have no incentive to participate.

Disadvantages of Existing System

1. Personal information exposes however users to significant risks, as social networks have been shown to leak and even sell user data to third parties.

Proposed System

In this paper, we take first steps toward addressing this conflict. Our approach is based on the concept of location centric profiles (LCPs). LCPs are statistics built from the profiles of

1. Users that have visited a certain location or
2. A set of co-located users.
First, we propose a venue centric PROFILR, that relieves the GSN provider from a costly involvement in venue specific activities. To achieve this, PROFILR stores and builds LCPs at venues. Furthermore, it relies on Benaloh’s homomorphic cryptosystem and zero knowledge proofs to enable oblivious and provable correct LCP computations. We prove that PROFILR satisfies the introduced correctness and privacy properties.

Second, we propose a completely decentralized PROFILR extension, built around the notion of snapshot LCPs. The distributed PROFILR enables user devices to aggregate the profiles of co-located users, without assistance from a venue device. Snapshot LCPs are not bound to venues, but instead user devices can compute LCPs of neighbors at any location of interest. Communications in both PROFILR implementations are performed over ad hoc wireless connections. The contributions of this paper are then the following:

1. Introduce the problem of computing location centric profiles (LCPs) while simultaneously ensuring the privacy and correctness of participants.
2. Propose PROFILR, a framework for computing LCPs. Devise both a venue centric and a decentralized solution. Prove that PROFILR satisfies the proposed privacy and correctness properties.

**System Architecture**
SYSTEM REQUIREMENTS:

HARDWARE REQUIREMENTS:

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

SOFTWARE REQUIREMENTS:

• Operating system : Windows XP.
• Coding Language : Java.
• Data Base : MY SQL