CENS Center for Embedded Networked Sensing

# Exploiting Social Networks for Sensor Data Sharing with SenseShare

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## Introduction: Social Networks and Data Sharing

### Social Networks

- **Social networks create groups and link people together**
  Facebook allows you to create a network with your friends and people you know.
- **Authentication and privacy**
  With sophisticated privacy settings, you can select who can see which information. For example, you can say that your immediate family can see your phone number, but no one else.
- **Open APIs for application developers**
  Facebook implemented an API to its service. This allows developers to build their own applications using the social networks the Facebook users create.

### Data Sharing

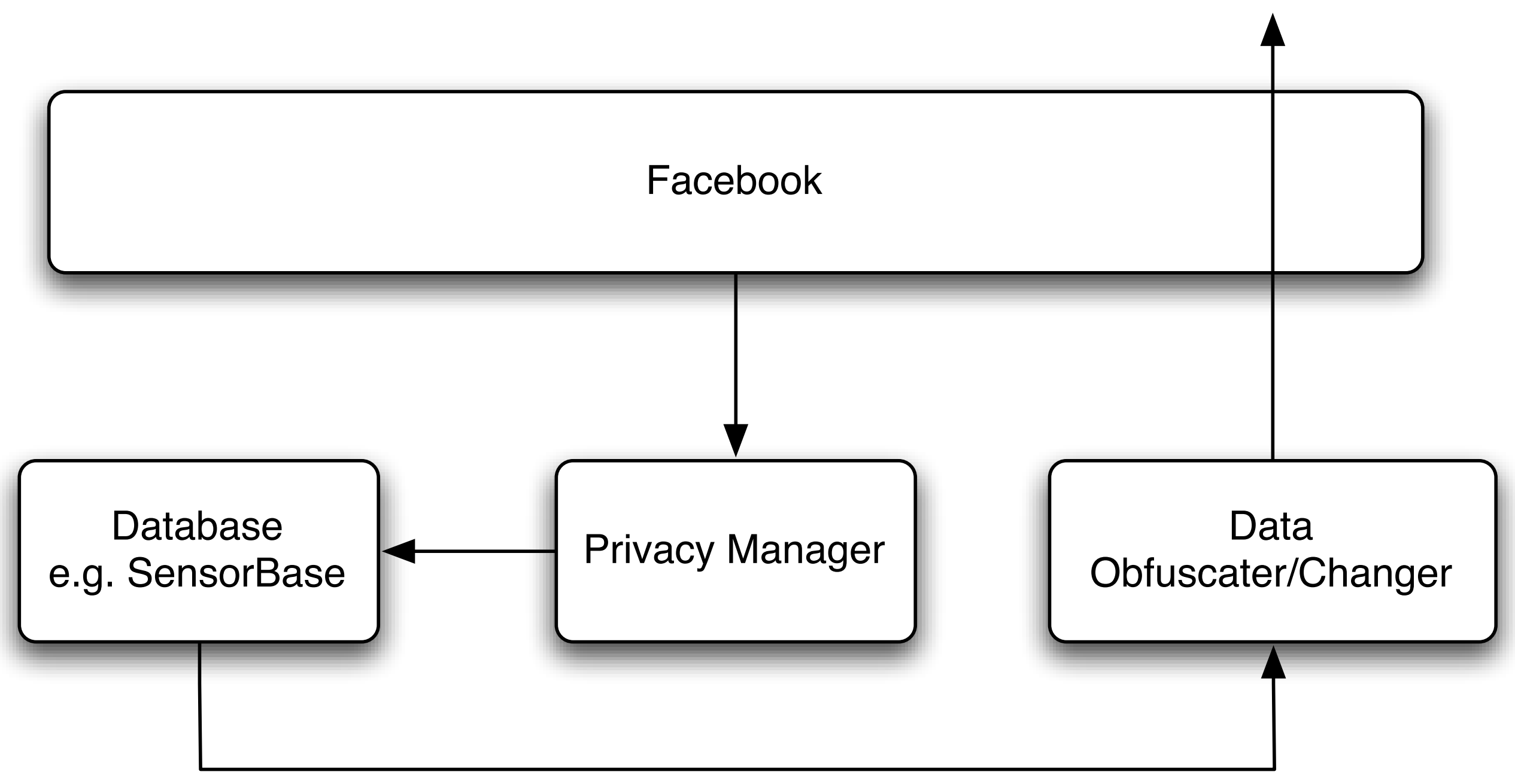
- **Urban Sensing**
  Researchers want to collect data by involving people in the process.
- **Location sharing**
  People want to share there whereabouts with their friends, but not everyone
- **Data collection**

## Problem Description: Privacy and Selective Sharing

- **Sharing, but with whom?**
  Each individual has his own policies of which data he wants to share with whom. For example, you might want to share your current location with all your family members, whereas you don't want to share this with the general public. Or you might be collecting the data from a small weather station in your backyard and want everybody to know about this data. SenseShare and the social network structure of Facebook will make it easy to select to whom you want to share what.
- **Trust**
  Everybody trusts some people more than others. Thus, you can apply different data filters for different individuals or groups. For example, to your immediate family, you give your exact location, whereas to you friends, you only share the current ZIP code, city, or even just country you reside in right now.
- **Assurance**
  If you share personal information, how can one assure that the people you trust don't misuse that trust you have in them?
- **Water marking**
  Can we apply similar techniques as for Digital Rights Management (DRM) in multimedia files for sensor data?

## Proposed Solution: SenseShare Architecture

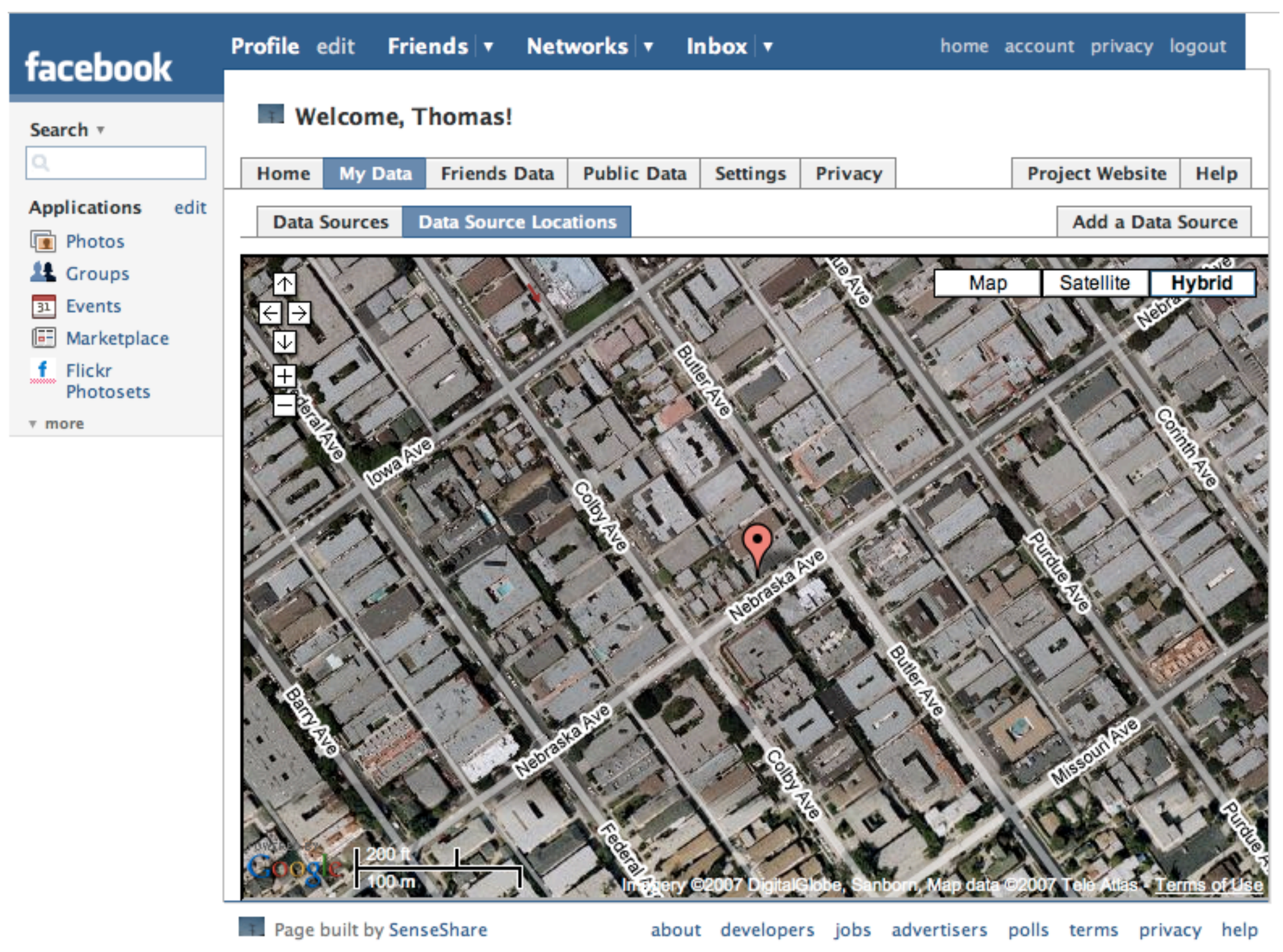
### General SenseShare Architecture



- **Facebook**
  This is the main frontend to the SenseShare architecture. Facebook provides a rich user interface, as well as an API into their social network infrastructure. For example, it is very easy to find out if someone is a friend of a user, and to what groups or networks a user belongs to. This can be used to provide a rich set of privacy options.
- **Privacy Manager (PM)**
  The PM is the core of the SenseShare architecture. It policies who can see what with what kind of resolution, or filters. It exploits the rich API provided by Facebook, in order to achieve a network of social trust.
- **Database**
  Currently we are using a simple MySQL database. We plan to have a generic data provider, such that the user himself could select where his data should be stored.
- **Data Obfuscater / Changer / Water Marker**
  The SenseShare user will have a choice of applying different filters for different users to his data. The filters range from adding random noise to measurements, specific location filters, to water marking of the outgoing data.

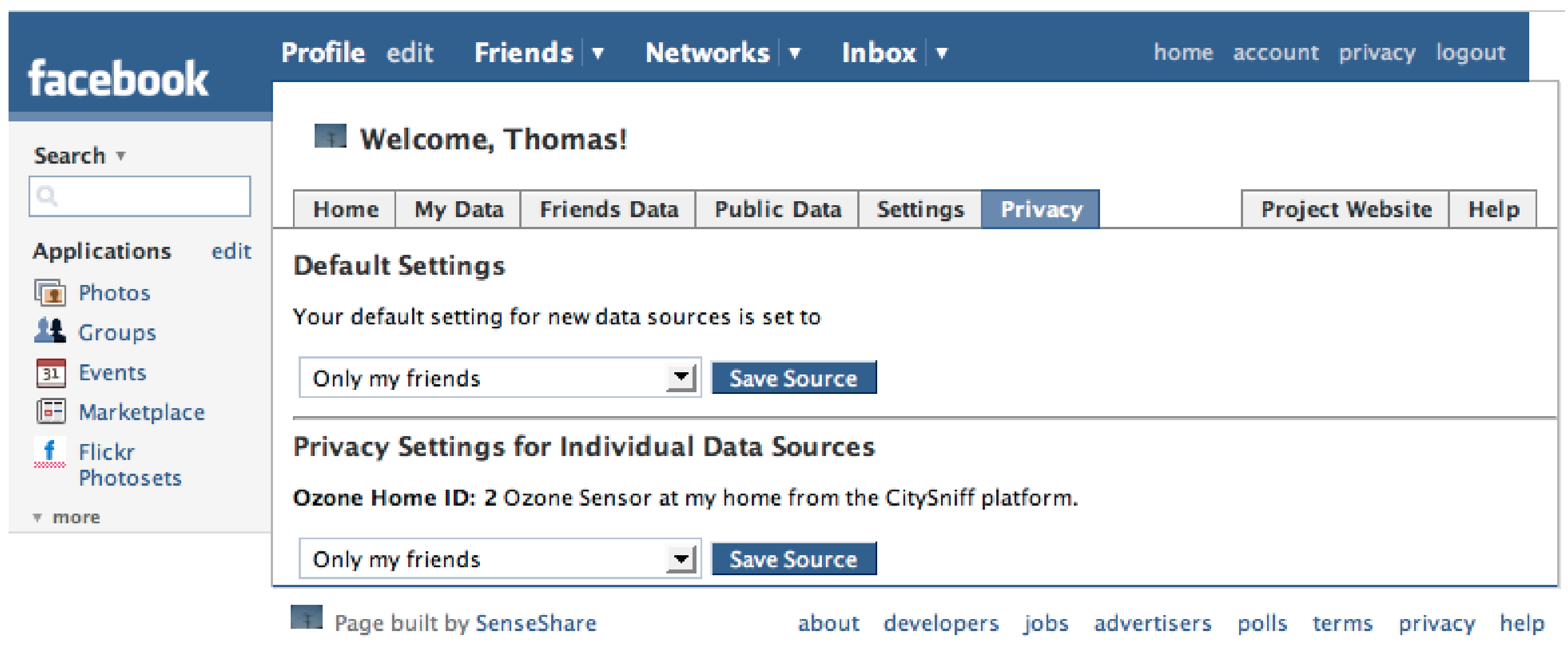
### Example Clients

- **CitySniff**
  Small and affordable pollution sensing kit for homes.
- **Cell phones**
  N80, OpenMoko
- **NetCar**
  Small computer for a car that logs the different car sensors and makes them accessible to the car owner.
- **Sensor Networks**
  A simple gateway application can expose the collected data from a sensor network through the SenseShare architecture.



Welcome, Thomas!

Page built by SenseShare



Welcome, Thomas!

Default Settings

Your default setting for new data sources is set to

Only my friends

Privacy Settings for Individual Data Sources

**Ozone Home ID: 2** Ozone Sensor at my home from the CitySniff platform.

Only my friends

Page built by SenseShare

**http://apps.facebook.com/senseshare - http://projects.nesl.ucla.edu/projects/senseshare/**

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