Indoor Positioning Services + Location Based Recommendations

Jim Hahn
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Wayfinder

**You are looking for:**

**Drugs and behavior: an introduction to behavioral pharmacology.**

*Call Number*: RM315 .M36 2013  
*Shelf Number*: 51

**CINAHL [electronic resource].**

*Location*: University of Illinois at Urbana-Champaign

**TV, food marketing and childhood obesity**

*Location*: University of Illinois at Urbana-Champaign

**Drugs and behavior: an introduction to behavioral pharmacology.**

*Location*: University of Illinois at Urbana-Champaign

**Surgery [electronic resource]**

*Location*: University of Illinois at Urbana-Champaign

**Internal medicine [electronic resource]**

*Location*: University of Illinois at Urbana-Champaign
Estimote Beacons
Beacon Components

Goals + Objectives

• Computing processes used to integrate beacons into app
  – Components for the recommendation algorithm
• Testing and improving beacon precision
  – Securing location based services
Integrating Beacons to App

1. User opens the Wayfinder app
2. The app sends a GET request to /version
3. The server responds with a version number
4. If the app’s stored version is < than the server’s, fresh beacon data is retrieved via a GET request to /beacons
5. The server responds with a JSON list of all beacon information
6. The phone stores the beacon information into a local database for quick retrieval during Bluetooth scanning and trilateration
Math Emergency: Trilateration
Modular APIs

Minerva APIs

- CARLI Reports Server
- VuFind index
- Custom SQL tables

Tomcat Web App
Recommendations Processing

// Get the patron’s physical coordinates
PatronLocation location = getLocation(locationInfo);

// Get shelf ranges from Minerva DB, based off of patron location
ArrayList<String> ranges = getRanges(location);

// Get relevant books/ebooks based off of the shelf ranges
BooksDB bookdb = getEBooks(ranges, context);

// Filter and add popular books that are near the patron
List<RecBooksModel> books = bookdb.bookList;

// Filter and add relevant ebooks that would be shelved
// near the user, if the ebook was a physical item
List<RecBooksModel> bookEBook = getPopularBooks(ranges, books);

// Add relevant databases, based off of the patron’s location,
// to the list
List<RecBooksModel> bookEBookDB = getDBSuggestions(bookdb.DBList, bookEBook);
Recommendations Processing

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Beacon Locations
Beacon Awareness Tests
Beacon Testing
Security: Estimote Cloud

Authentication

Every beacon is automatically registered in the Estimote Cloud and assigned to its owner in the factory, based on the email address using during purchase. If a user is not an owner of the beacon, they won’t be able to change any settings.

When you connect to a beacon with Estimote app, you will see its basic properties like UUID, Major, Minor, and Color. But to be able to configure beacons’ settings with Estimote app, you need to be logged in to your Estimote Account and Estimote Cloud needs to authenticate you as the owner. If you don’t have an account, you can sign up here.

The same applies to Estimote SDK, but instead of Estimote Account login and password, we use API tokens to authorize access for third party apps.

Securing Local DB
### Securing Local DB

#### Beacons

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Conclusion + Project Next Steps

- Look for Wayfinder update to the Minerva app on Android Play store this Summer 2016.
- Updates from Technology Prototyping Projects Page: http://sif.library.illinois.edu
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Estimote Resources
