Accurate Shop Positioning for the Customer in the Mall

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1. Motivation

The expansion of the shopping malls' scale leads to two problems:

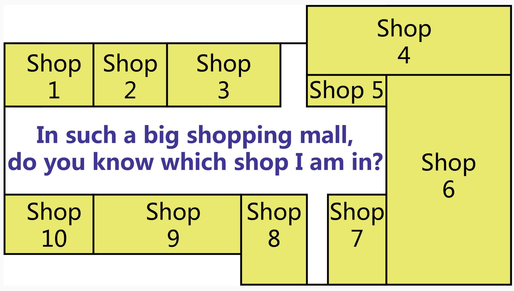
- ❏ For customers:
  Difficult to find the target shop
- ❏ For malls:
  Difficult to decide marketing strategies

Given information about:

- ❏ Shop information
- ❏ GPS location of the customer
- ❏ Surrounding environment information, such as WIFI

The target of our project:

- ❏ Accurately determine the shop where the customer is currently located



Challenges:

- ❏ Loss of shop information
- ❏ GPS is not suitable for indoor location
- ❏ Incomplete environment information

2. Problem definition

Data from 97 shopping malls

2017.08.01 — 2017.08.20 — 2017.08.31

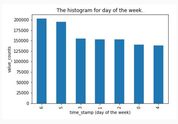
Training set (596967) | Test set (451608)

Input:
(row_id, user_id, mall_id, time_stamp, longitude, latitude, wifi_infos)

Output:
shop_id

3. Feature extraction methods

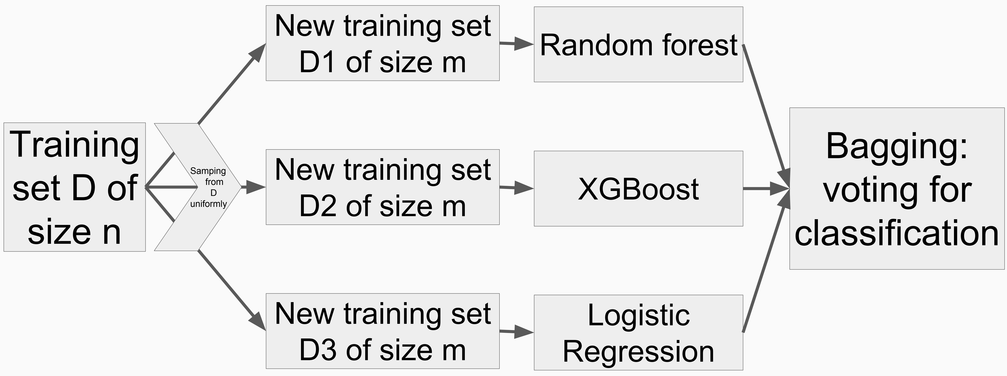
The wifi_infos of one row is as follows:
b_34366982|-82|false;b_37756289|-53|false;...



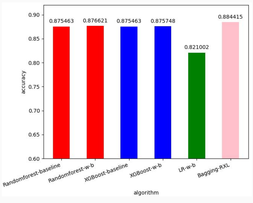
- ❏ Convert wifi_infos to **WIFI features**
- ❏ WIFI features dimensionality **reduction** (can reduce 3000+ WIFI to 500+)
- ❏ WIFI signal **strength transformation**
- ❏ Creating new feature **'weekend'**
- ❏ Creating new feature **'busy'**

4. Algorithms

The proposed algorithm: Bagging-RXL



5. Experiments



- ❏ WIFI dimensionality reduction can help extract stable WIFI from all the WIFI.
- ❏ When features 'weekend' and 'busy' are added to the model, the accuracy improves.
- ❏ Our proposed Bagging-RXL algorithm outperforms other algorithms.