

# HUBBS LABS

## PROXIMITY BEACONS

BY: SIMAN SHRESTHA

MAY 02, 2018

---

### INTRODUCTION

#### ABOUT

This is a brief documentation that will describe how to install and use software used for proximity location data.

#### TECHNOLOGIES

- iOS application (DeskObserver) for communicating with Estimote's ( <https://estimote.com/> ) Proximity Beacons.
- A small python script called *fetchEstimoteData.py* for fetching proximity data and exporting to .csv format.

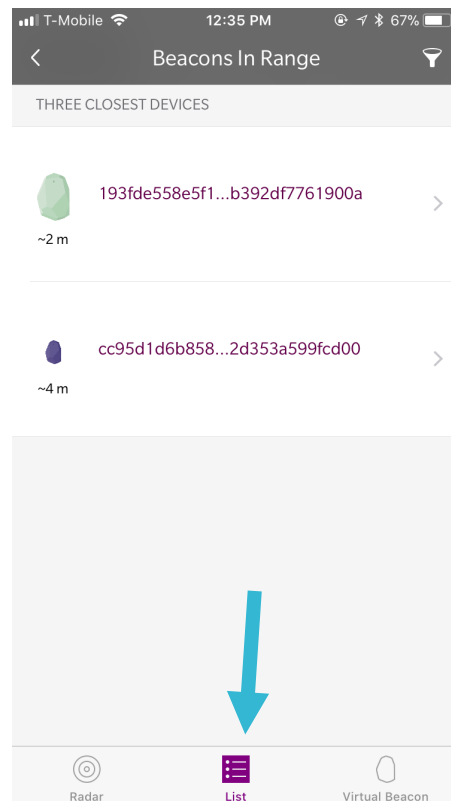
### SETUP

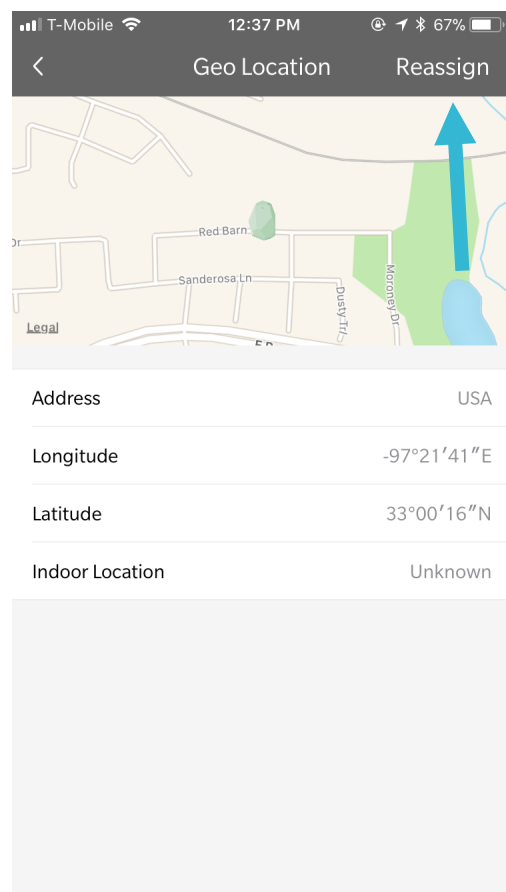
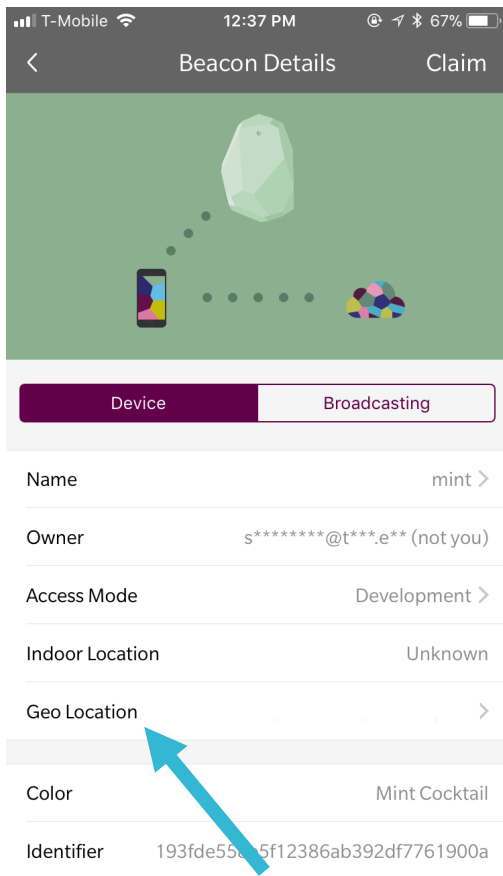
#### ESTIMOTE CLOUD

- 1) Place two Estimote beacons where you would like to use them for testing
- 2) Log in with your Estimote Cloud account at <https://cloud.estimote.com/>
- 3) Make sure your beacons are registered with your account

## BEACON SETUP

- 1) Click on Beacons tab on ( <https://estimote.com/> )
- 2) Select the checkbox next to the mint beacon, then click edit to open the Edit Settings window.
- 3) Set the Geo Location (physical address) of the beacon. **Note:** This can also be done through the Estimote App available on the app store. Steps to change the Geo Location of a beacon can be seen in the images below.





- 4) After you have updated the Geo Location for the beacon, create a tag for your beacon with an appropriate name such as "Desk" or "Window"
- 5) Make sure Access Mode is set to Development
- 6) On the navigation ribbon on the left side of the Edit Settings window, click on *Beacon Attachment*. Add the following Key and Value attachments:

Edit Settings

You can change beacons settings remotely. Set them here and they will be updated when you approach the beacons with the **Estimote iOS App**, or an app with the **Estimote iOS SDK** integrated. [Learn more about remote beacon management.](#)

Device

- Beacon Attachment
- Connection
- iBeacon
- Eddystone-UID
- Eddystone-URL
- Eddystone-TLM
- Estimote Telemetry
- Estimote Monitoring

Key

Value

beacon

venue

+

 Add Attachment

mint

office

Remove

Remove

7) Next click on the *Connection* tab on the navigation ribbon, and enter the following settings (Details on broadcasting can be seen later in this documentation):

Edit Settings

You can change beacons settings remotely. Set them here and they will be updated when you approach the beacons with the **Estimote iOS App**, or an app with the **Estimote iOS SDK** integrated. [Learn more about remote beacon management.](#)

Device

- Beacon Attachment
- Connection
- iBeacon
- Eddystone-UID
- Eddystone-URL
- Eddystone-TLM
- Estimote Telemetry
- Estimote Monitoring

Interval (100 to 10000 ms)

Broadcasting Power (dBm)

Shake to Connect

900

-8

On

8) Repeat these steps for the Blueberry beacon.

## APP SETUP

- 1) Click the Apps tab on the estimate cloud website
- 2) Click on Add New App -> Your Own App -> Get App ID & Token
- 3) Name your app
- 4) Open the Xcode project for the App by following this path: :  
*HUBBS Beacon App 1.0 -> Beacon App -> Swift -> DeskObserver -> DeskObserver.xcodeproj*
- 5) Under "Proximity Configuration" edit the credentials to match the *appID* and *appToken* of the app you created in steps 1-3.

```
// ---- Proximity Configuration ----  
  
// put your App ID and App Token here  
// You can get them by adding your app on https://cloud.estimote.com/#/apps  
let credentials = EPXCloudCredentials(appID:"enter_appID", appToken:"enter_appToken")
```

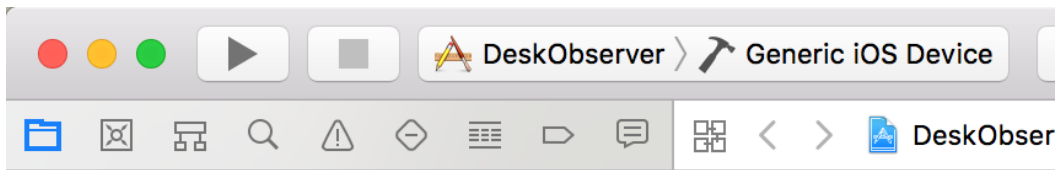
## INSTALLATION

### IOS APP

The DeskObserver App is currently not available on Apple's app store, but can still be installed for free using Apple's Xcode IDE.

Note: Xcode is only available for Mac OS

- 1) Follow this path: *HUBBS Beacon App 1.0 -> Beacon App -> Swift -> DeskObserver -> DeskObserver.xcodeproj*
- 2) Opening *DeskObserver.xcodeproj* should automatically open the program in Xcode.
- 3) Connect your iOS device to the computer.
- 4) In the top left portion of the screen, click on *Generic Device*.



- 5) Scroll to the top to find your device, and click on it.
- 6) Make sure your phone is unlocked, and touch “Trust this Computer” when prompted on your device.
- 7) Click on the Play button to build the project onto your device.
- 8) The app should be successfully installed on your device.

## PYTHON SCRIPT

The *fetchEstimateData.py* makes it easy to obtain proximity data.

The default script is set to fetch *Get visit duration for device* (retrieves visit duration for a specific beacon). You can choose which type of data you want to export by looking at Estimote’s API:

[https://cloud.estimote.com/docs/?utm\\_source=Cloud&utm\\_medium=referral&utm\\_content=GetLoyalty&utm\\_campaign=API%20Hooks#api-Analytics\\_Public\\_Beta-GetLoyalty](https://cloud.estimote.com/docs/?utm_source=Cloud&utm_medium=referral&utm_content=GetLoyalty&utm_campaign=API%20Hooks#api-Analytics_Public_Beta-GetLoyalty)

It is important to change the credentials in this script in order to get the correct data from your beacons/app. The following is a code snippet from *fetchEstimateData.py* that shows where to enter your credentials:

```
url_1 = 'https://cloud.estimote.com/v2/analytics/devices/  
beacon_identifier/duration?from=Beginning of the reporting  
period (Unix timestamp)&to=End of the reporting period (Unix  
timestamp)&granularity=hourly'
```

Note: granularity  
can be changed to  
different units.

```
response_1 = requests.get(url_1, auth = ('AppID', 'TokenID'))
```

Note: beacon\_identifier can be  
found under the *Beacons* tab on  
<https://cloud.estimote.com/#/>

Note: A **visit** is the time that a visitor spent in  
range of beacons, and to be reported it must  
longer than 60 seconds and shorter than 8

Here are steps to run the script on Mac OS:

- 1) Make sure *fetchEstimateData.py* is saved in Python's current working directory.
- 2) Open terminal and run `python fetchEstimateData.py`
- 3) A "ProximityData.csv" file should appear in the same directory that the python file is saved in.

## BEACON SETTINGS (SIMPLIFIED)

### TRIGGER DISTANCES

Key words for trigger distances have been defined in Estimote's SDK.

- The *far* keyword sets the trigger distance to 5 meters.
- The *near* keyword sets the trigger distance to 1 meter.
- Custom trigger distances (in meters) for the beacons can be defined as well.
  - `EPXProximityZone(range: EPXProximityRange.custom (desiredMeanTriggerDistance: 1.5)!, ...`

According to Estimote's documentation they call this feature a software-defined range. Note that this is independent of the beacon's physical broadcasting range. By default, Estimote Beacons have a physical range +50 meters. This sets the upper limit of what you can define for your Proximity Zones, and you can boost it further by increasing the beacon's Broadcasting Power (This comes at the expense of the battery life, so only do this if you need to).

Estimote emphasizes that the "desired mean trigger distance" is quite a mouthful, but that's because we really want to emphasize that distance estimations based on Bluetooth signal strength are pretty

rough. The actual trigger range may vary based on the beacon placement, the environment, and many other factors.

Tip: In general, the closer to the beacon, the more accurate the trigger. That is, a 3-meter trigger should be more precise and consistent than a 30-meter trigger. It's worth to keep that in mind when planning your proximity zones and the placement of your beacons.

### BROADCASTING POWER

Broadcasting power determines the strength of the Bluetooth signal between a mobile device and a beacon. A strong connection is imperative for reliable communication between your iPhone and the beacons. Here are some basic things you should keep in mind:

- Increasing the power can make the signal **more stable** and **extend the signal range**, but keep in mind it can have a negative effect on battery life.
- The beacon's range is technically up to 70 m (+ 4dBm) for Proximity Beacons. In real-world conditions, however, you should expect up to 40-50 m.

### ADVERTISING INTERVAL

Beacons do not broadcast constantly. They 'blink' instead. Advertising Interval describes the time between each blink. Therefore, **the shorter the interval, the more stable the signal**. Keep in mind that adjusting Advertising Interval significantly impacts the battery life.