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Enhance Advertisement for Offline Shopping by Using BLED One Touch Information

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Abstract

We develop a system and a phone application using BLE Device technology to facilitates the analysis of result by stakeholder in order to highlight shortcoming in the service. We use a Bluetooth low energy (BLE) based BLE Device. This system consists of a smartphone application that senses the user location through the BLE Device technology to deliver relevant content based on the location. It also includes web-based platform with two interfaces.

The system announces the next direction to go to the destination at the right place and timing. We think that this type of particular place guidance can be realized when the Device module place two types of role: Quite and Notified Device modules. We introduce an historical guidance system by placing these modules along passage ways in a historical places appropriately to change the contents of advertised information displayed on the smartphone depending on the history of that place. This method for changing the contents of advertised information enables to navigating pedestrians to their destination.

Introduction

BLE Device is a new technology developed by Apple that has been built into its operating system and devices. It is based on BLE (Bluetooth Low Energy). BLE Device functions as an indoor positioning system, that allows businesses to advertise their presence to nearby smartphones. With BLE Devices set up, businesses can send messages to potential customers (such as special offers or goods) when they walk past an BLE Device.

BLE Devices are standalone devices that constantly send out a UUID (Universally Unique Identifier) using Bluetooth 4.0 Low Energy. The BLE Device devices can come in different form factor.

BLE Device is a concept of wireless communication service using Bluetooth low energy (BLE). It enables to communicate between a Device module and a smartphone at proximity with saving electric power. The Device module emits radio waves based on BLE to broadcast

A typical use case of BLE Device is automatic information transferring for in-store advertising and couponing. It also enables to use as guide at historical places where the Device module is placed and Received Signal Strength Indicator (RSSI) measured by smartphone.

A service by BLE Device is usually done by a single Device module that corresponds to single automatic triggering for push-type information advertising regardless of any context of smartphone users approaching to the module.

Related Work

Kumar et al, [6] presented an internal localization system called uricase that emulates large antenna arrays on user devices through a completely unique formulation of synthetic Aperture Radar (SAR). Uricase is micro location and proximity-based services, however the energy consumption of the uricase location is high and requires its users to rotate their devices for location purposes [6]. Furthermore, the user device must have a minimum of two antennas to emulate large antenna arrays.

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Klokmose et al. [2] proposed a Wi-Fi proximity detection system for mobile web application that is based on proximity adaptive HTTP responses. Despite its low cost, this approach can only offer proximity based services if the consumer interface is generating traffic [2]. Furthermore, Wi-Fi also lacks the required accuracy for proximity detection as describe by Ghose [7] and isn't energy efficient bolic et al required accuracy for proximity detection as described by Ghose [7], and isn't energy efficient. Bolic et al [3] proposed a completely unique RFID device called "sense-a-tag" (ST) for detecting and decoding backscatter signals from different tags in its vicinity. The proposed ST is incorporated in a very standard RFID system to enhance proximity detection accuracy for IOT. However, the range of RFIDs may be a major challenge particularly in large spaces. Ghose et al. [7] proposed a mobile for proximity detection a brand-new path-loss model that takes the mobile orientation under consideration to enhance the system performance is described in [7]. The drawbacks of those technologies is that they're not primarily focused on accurate and energy efficient PBS. In contrast, BLE Beacon technology is more fitted to proximity detection. In our prior work [8], we used BLE Beacon to produce indoor localization to produce indoor localization services to any user. We used particle filtering to trace the placement of a user with a localization error as low as 0.97 meters. During this paper, we describe two novel server-based proximity detection algorithm that respectively leverage moving average and Kalman filter to enhance the accuracy of an BLE Beacon based proximity detection system. To the simplest of our knowledge, this can be the first try to improve the proximity detection accuracy of BLE Beacon using Kalman filters.

Our first algorithm, the server side running average (SRA), suitable for environments with less interference noise (in less crowded place like coffee shops or commissary with fewer Wi-fi.

Proposed System

The device provides information in the form of fields via Bluetooth Low Energy UUID, major, minor are the three values provide the identifying information for the device. UUID is specific to the BLE Device for differentiating different BLE Devices, major further specifies a specific device and use case, minor allows further subdivision of region,specified by application developer.

Proximity States are as follows: -

1**. Immediate**: This represents that device is physically very close to the BLE device.

2. **Near**: This indicates proximity of approximately 1-3 meters.

3. **Far**: This state indicates the Device can be detected but the accuracy is too low.

4. **Unknown**: The proximity of the Device is not determined.

Once after installing the Device wireless hardware at a particular location, the signals are received from mobile devices through the App. The signal strength is generally correlated to how far away a device is from Device. This Device are mobiles and can be placed around tourist and other historical places, it is easier to personally inform brief information of the particular place to visitors. The Device utilizes Bluetooth Low Energy Technology which consumes much less battery.

This application comprises of following methodologies:

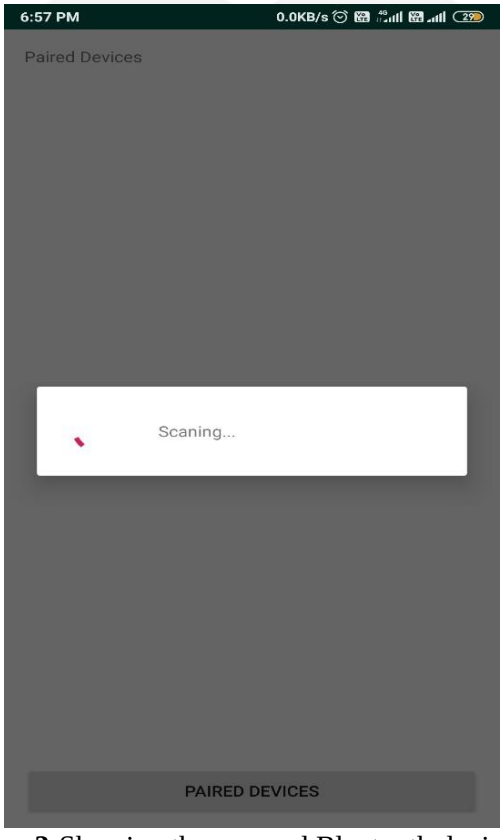
If User is near BLE device -

1. User have to pair smartphone with BLE device.
2. User receives the notification of advertisement of particular shopping mall.
3. Click on the notification user can see the advertisement of shopping mall like product details, specs, offer.

Implementation

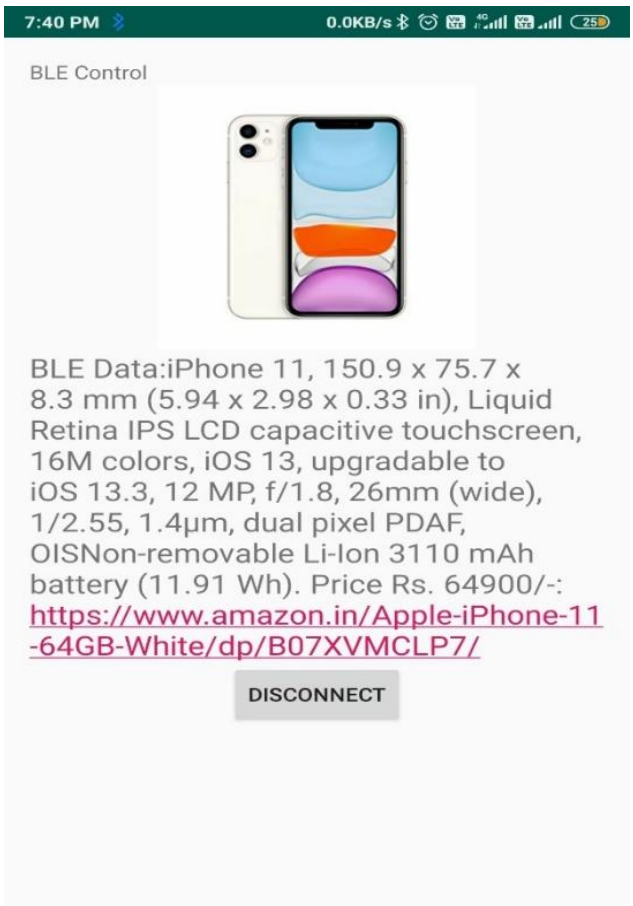
Step 1: Grantthe permission of Bluetoothwhich are required by the application to use the application.

Step 2: After giving the permission the BLED application starts the scanning process of Bluetooth.



Step 3: Showing the scanned Bluetooth devices.

Step4: After connecting to BLE device showing advertisement of shopping mall.



Conclusion

This application makes it easier to personally deliver brief of the particular place to visitors.

By implementing this concept, we can overcome the middlemen's act in distorting the tourist.

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These Device devices are portable and can be placed around tourist and other historical places.

The Device devices utilize Bluetooth low energy technology which consumes much less battery.

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