**FINAL REPORT**

* **Title page**
* **Abstract**
* **Acknowledgment**
* **Table of contents**
* **Introduction**
* **Objectives + Motivation**
* **Literature review**
  + **BLE**
  + **Beacon technology background (In depth) e.g UUID, Major, Minor number + TxPower, RSSI, Discoverable/non discoverable mode**
  + **Phone integrate beacon (In depth)**
  + **Indoor Localization (Trilateration)**
* **2nd Chapter (Actual work)**
* **3rd Chapter (Testing)**
* **Conclusion**
* **4th Chapter (Future improvements)**
* **Bibliography**

**iBeacon**[[edit](https://en.wikipedia.org/w/index.php?title=Bluetooth_low_energy_beacon&action=edit&section=14)]

In mid-2013 [Apple](https://en.wikipedia.org/wiki/Apple_Inc.) introduced [iBeacons](https://en.wikipedia.org/wiki/IBeacon" \o "IBeacon) and experts wrote about how it is designed to help the retail industry by simplifying payments and enabling on-site offers. On December 6, 2013, Apple activated iBeacons across its 254 US retail stores.[[23]](https://en.wikipedia.org/wiki/Bluetooth_low_energy_beacon#cite_note-23) McDonald's has used the devices to give special offers to consumers in its fast-food stores.[[8]](https://en.wikipedia.org/wiki/Bluetooth_low_energy_beacon#cite_note-mcforbes-8) As of May 2014, different hardware iBeacons can be purchased for as little as $5 per device to more than $30 per device.[[24]](https://en.wikipedia.org/wiki/Bluetooth_low_energy_beacon#cite_note-24) Each of these different iBeacons have varying default settings for their default transmit power and iBeacon advertisement frequency. Some hardware iBeacons advertise at as low as 1 Hz while others can be as fast as 10 Hz[[25]](https://en.wikipedia.org/wiki/Bluetooth_low_energy_beacon#cite_note-25). iBeacon technology is still in its infancy. One well reported software quirk exists on 4.2 and 4.3 Android systems whereby the system's bluetooth stack crashes when presented with many iBeacons.[[26]](https://en.wikipedia.org/wiki/Bluetooth_low_energy_beacon#cite_note-26) This was reportedly fixed in Android 4.4.4.[[27]](https://en.wikipedia.org/wiki/Bluetooth_low_energy_beacon#cite_note-27)

**AltBeacon**[[edit](https://en.wikipedia.org/w/index.php?title=Bluetooth_low_energy_beacon&action=edit&section=15)]

AltBeacon is an open source alternative to iBeacon created by Radius Networks[[28]](https://en.wikipedia.org/wiki/Bluetooth_low_energy_beacon#cite_note-:2-28)

**URIBeacon**[[edit](https://en.wikipedia.org/w/index.php?title=Bluetooth_low_energy_beacon&action=edit&section=16)]

URIBeacons are different from iBeacons and AltBeacons because rather than broadcasting an identifier, they send a URL which can be understood immediately.[[28]](https://en.wikipedia.org/wiki/Bluetooth_low_energy_beacon#cite_note-:2-28)

**Eddystone**[[edit](https://en.wikipedia.org/w/index.php?title=Bluetooth_low_energy_beacon&action=edit&section=17)]

Eddystone is a Google's standard for Bluetooth beacons. It supports three types of packets, Eddystone-UID, Eddystone-URL, and Eddystone-TLM.[[16]](https://en.wikipedia.org/wiki/Bluetooth_low_energy_beacon#cite_note-:8-16) Eddystone-UID functions in a very similar way to Apple's iBeacon, however, it supports additional telemetry data with Eddystone-TLM. The telemetry information is sent along with the UID data. The beacon information available includes battery voltage, beacon temperature, number of packets sent since last startup, and beacon uptime.[[16]](https://en.wikipedia.org/wiki/Bluetooth_low_energy_beacon#cite_note-:8-16)