DECLARATION

I, Gurpreet Singh Matharu, Student of M.Tech (I.T) hereby declare that the Dissertation titled "**Enabling Location Aware Services on Handheld Devices using iBeacons**" which is submitted by me to Department of Information Technology, Amity School of Engineering and Technology, Amity University Uttar Pradesh, Noida in partial fulfillment of requirement for the award of degree of Master of Technology in Information Technology, has not been previously formed the basis for the award of any degree, diploma or other similar title or recognition.

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Date GURPREET SINGH MATHARU

CERTIFICATE

On the basis of Dissertation submitted by **Gurpreet Singh Matharu**, Student of M.Tech (I.T), I hereby certify that the Dissertation "**Enabling Location Aware Services on Handheld Devices using iBeacons**" which is submitted to Department of Information Technology, Amity School of Engineering and Technology, Amity University Uttar Pradesh, Noida in partial fulfillment of requirement for the award of the degree of Master of Technology in Information Technology is an original contribution with existing knowledge and faithful record of work carried out by him under my guidance and supervision.

To the best of my knowledge this work has not been submitted in part or full for any Degree or Diploma to this University or elsewhere.

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ABSTRACT

Bluetooth Low Energy (BLE) is an emerging technology that enables low-energy, low-cost and short–range communications, whereas iBeacon is an Apple's standard that has been recently gaining attention, being based on BLE standard. iBeacons are BLE-enabled small-sized wireless sensors that are already exhibiting the potential of powering a whole range of BLE-enabled applications in verticals such as retail stores, museums, airports to name a few. The thesis presents a detailed study of BLE as well as iBeacons with a major focus being on Estimote iBeacons. This thesis includes the design and development of custom android appication that interacts with Estimote iBeacons. Further, issues in localization algorithms pertaining to wireless sensor networks have been discussed, followed by proposed localization algorithm for iBeacon networks. Then, the thesis moves on to the security part of iBeacons, discussing the associated security concerns, besides proposing several security solutions. The thesis concludes with the future scope of iBeacon technology.

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