Indoor Positioning: Novel Approach for Bluetooth Networks using RSSI Smoothing

Abstract

In recent years, localization and navigation have been important topics in research. The most popular navigation system is an outdoor navigation with “GPS”; however, the positioning within indoor environments is not possible with “GPS”, so it is resulting in limited operation for indoor environments. In order to overcome this limitation, this paper discussed Bluetooth Low Energy technology based localization model. The “BLE” provides several major forms of parameters linked to location estimation such as “RSSI” and “LQI”. In real time applications such as object tracking and distance estimates require continuous reception of RSSI measurements to estimate the position of the object accurately. Nevertheless, on that point, there are some constraints such as signal attenuation, signal loss, multipath effects, temperature, reflection, a human body and other communication signals. Hence, this research work considered the “RSSI” smoothing approaches. Although there are so many solutions, no RSSI smoothing method has been recognized as a standard method. This paper presents a Feedback filter together with shifting technique at distance domain to reduce fluctuations of the real-time
signals. Experiments show that the probability of locating errorless and it is better than the other existing interference avoidance algorithms.

References

1. Dr. Rainer Mautz, Indoor Positioning Technologies. Institute of Geodesy and Photogrammetry, Department of Civil, Environmental and Geomantic Engineering, ETH Zurich, February 2012.

Index Terms
Keywords

LQI, BLE, RSSI, Feedback Filter, Shifting Technique.