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Bulletin of Electrical Engineering and Informatics
Volume 8, Issue 3, September 2019, Pages 970-977

Analysis of different digital filters for received signal strength indicator (Article)

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Abstract

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Due to high demand in Internet of Things applications, researchers are exploring deeper alternative methods to provide efficiency in terms of application, energy, and cost among other factors. A frequently used technique is the Received Signal Strength Indicator value for different Internet of Things applications. It is imperative to investigate the digital signal filter for the Received Signal Strength Indicator readings to interpret it into more reliable data. A contrasting analysis of three different types of digital filters is presented in this paper, namely: Simple Moving Average filter, Alpha Trimmed Mean filter and Kalman filter. There are three criteria used to observe the performance of these digital filters which are noise reduction, data proximity and delays. Based on the criteria, the choice of digital signal processing filter can be determined in accordance with its implementations in practice. For example, Alpha-Trimmed Mean filter is shown to be more efficient if used in the pre-processing of Received Signal Strength Indicator readings for physical intrusion detection due to its high data proximity. Hence, this paper illustrates the possibilities of the use of Received Signal Strength Indicator in different Internet of Things applications given a proper choice of digital signal processing filter. © 2019 Institute of Advanced Engineering and Science. All rights reserved.

Author keywords

Alpha trimmed mean Digital filter Energy security Kalman filter Received signal strength RSSI
Simple moving average Transceivers

Funding details

Funding sponsor	Funding number	Acronym
International Islamic University Malaysia		IIUM
Ministry of Higher Education, Malaysia	PRGS16-009-0040	MOHE
Ministry of Higher Education, Malaysia		MOHE

Funding text

The research done in this paper is partially funded by the Malaysian Ministry of Higher Education (MOHE) under Prototype Development Research Grant (PRGS), PRGS16-009-0040 and IIUM Publication RIGS grant no. P-RIGS19-003-0003.

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