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Mitigation of multipath fading in indoor radiometric fingerprinting systems (Article)

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Abstract

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Wireless sensor network technology offers endless possibilities for innovative solutions for different security and intrusion detection and recognition applications. By distributing multiple clusters of preconfigured wireless sensor network detection nodes, a widely monitored area can be consistently checked for intruders. These systems are simple, easy to install and reliable in detecting intruders automatically. This paper presents the utilization of a wireless sensor network as a non-invasive human identification system for smart homes and security applications. The proposed scheme analyzes the effect of individuals moving into a monitored area, where the 2.4 GHz wireless sensor network has been installed. It is imperative to comprehend the critical impact caused by different human bodies on multiple readings of Received Signal Strength Indicator collected at different levels for individuals at the same recording position. Multiple experiments were performed by utilizing the wireless sensor network nodes on different individuals at different positions. The paper particularly studies the effect of filtration and change of filtering parameters used to mitigate the multipath effect on the accuracy and detection capacity of the presented IEEE802.15.4-based radiometric human identification scheme. © 2018

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Author keywords

- Alpha-trimmed filter
- Energy security
- Multipath fading
- Radiometric fingerprinting
- Wireless sensor networks

Indexed keywords

Engineering controlled terms:

- Automation
- Energy security
- Intelligent buildings
- Intrusion detection
- Mobile computing
- Multipath fading
- Radiometry
- Sensor nodes
- Wireless sensor networks

Engineering uncontrolled terms

- Alpha-trimmed filter
- Filtering parameters
- Human identification
- Innovative solutions
- Multi-path effect
- Radiometric fingerprinting
- Received signal strength indicators
- Security application

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