

# **Multi-objective Optimization Modeling for the Impacts of 2.4-GHz ISM band Interference on IEEE 802.15.4 Health Sensors**

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Health monitoring system is an important application since the last decade. A Health monitoring system comprises of different health sensors such as wearable sensor, ECG sensor, pillow sensor and bed sensor. All of these sensors operate on the license-free 2.4-GHz industrial, scientific, and medical band (ISM). Thus probably the issue of interference by other devices is high especially the ones that use this band like microwave oven and Wi-Fi. Here, we try to provide a mathematical multiobjective model to help understand the issues and impacts of 2.4-GHz ISM band interference on IEEE 802.15.4 health sensors. Our composite model maximizes network throughput and energy efficiency. We used three evolutionary algorithms: SPEA-II, NSGA-II and OMOPSO for the experimental evaluation of our study. The findings are interesting as interference varies according to topology and distance.

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