

Assignment 2: Channel sensing

Wireless Sensor Networks

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November 6, 2023

1 Introduction

IEEE 802.15.4 uses ISM band 2.4 GHz radio frequencies (from channel 11 to channel 26) to transmit sensor data. These frequency are also used by other radio technologies, such as WiFi, Bluetooth, and others. To setup a WSN, it is an important step to select a channel with minimum interference.

As such, in this assignment I try to find the channel with minimum interference by measuring the noise/interference signal strength on different channels.

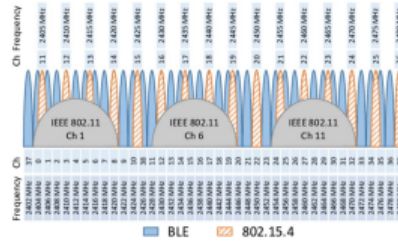


Figure 1: Channel Coexistence in 2.4 Ghz [1]

2 Results

Tests were run in collaboration with other members of group 3, as it provided an easy way to obtain the plots for the results. As such, the algorithm ran for 10 iterations to make sure the best channel was not an outlier, but consistently the better channel. As seen in Fig. 2, channel 24 was consistently showing the weakest or 2nd weakest signal, indicating the least or 2nd least noise in all iterations.

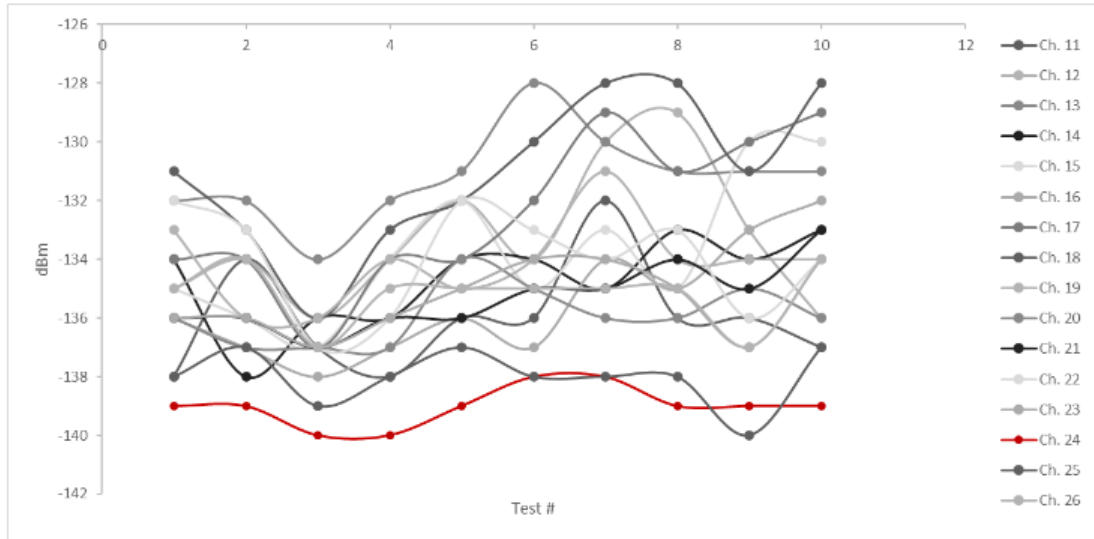


Figure 2: Results of channel sensing

3 Discussion

As this assignment was tested without actually sending any data, it is important to note that we prefer the weakest signal strength, as it only measures noise and no actual information.

To make sure the measurements were accurate, the sampling time was set to half a second on each channel. This allowed around 30000 readings in this period, as each reading contains 8 symbols, and lasts $128 \mu s$.

References

- [1] Assignment 2: Channel Sensing, document.