

# **Everything You Need to Know About RSSI**

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**I649E Wireless Sensor Networks**


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## I649E's Github

<https://github.com/i649e/wsn-lab>

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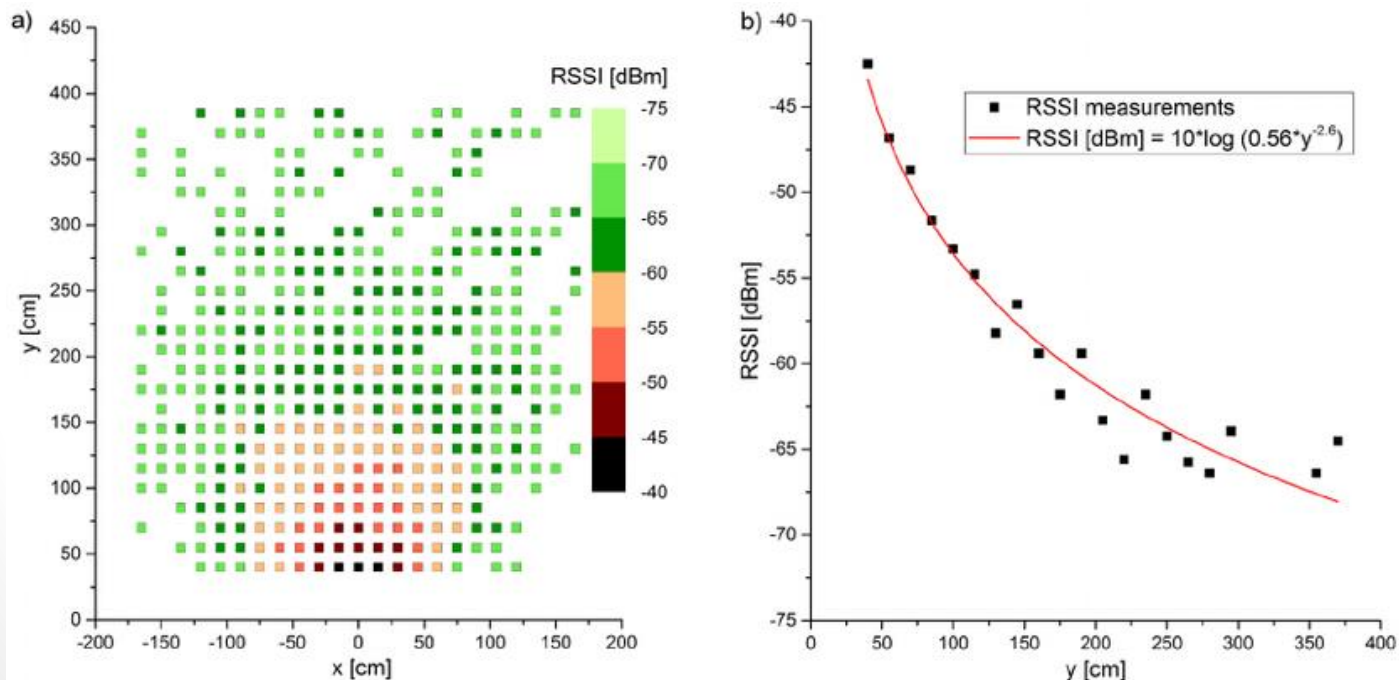
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 Chapter_06_Raspberry_Pi_3_Model_B_Getting_Started_Guide.pdf	change guide	3 minutes ago
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# Received Signal Strength Indication (RSSI)

RSSI indicates the power present in a received radio signal.





# Log Distance Path Loss Model

$$PL_{d_0 \rightarrow d} = PL(d_0) + 10n \log_{10} \left( \frac{d}{d_0} \right) + \chi$$

$PL_{d_0 \rightarrow d}$  = path loss at an arbitrary distance  $d$

$PL(d_0)$  = path loss at distance  $d_0$

$d_0$  = initial distance. **Usually set it very small  $\approx 10\text{cm}$**

$d$  = arbitrary distance

$n$  = path loss exponent

$d$  = current distance of the node

$\chi$  = gaussian noise with  $N(0, \sigma^2)$



## Find $n$ (Path Loss Exponent) of the Environment

1. Place two raspberry pi according to  $d_0$  value
2. Read RSSI from the device and record it
3. Place two raspberry pi further away from each other ( $d = 1-2$  m)
4. Read RSSI from the device and record it
5. Use log distance path loss model to find the path loss exponent  $n$

**Note:** the path loss exponent  $n$  depends a lot on environment, node positions and different nodes may have different values. Try to find the indoor open area with a clear line of sight to get a good value.



# Raspberry Pi RSSI

When two nodes are in the same network, they can get RSSI of each other using:

```
iw dev wlan0 station get <destination_mac_address>
```

The result should be like this:

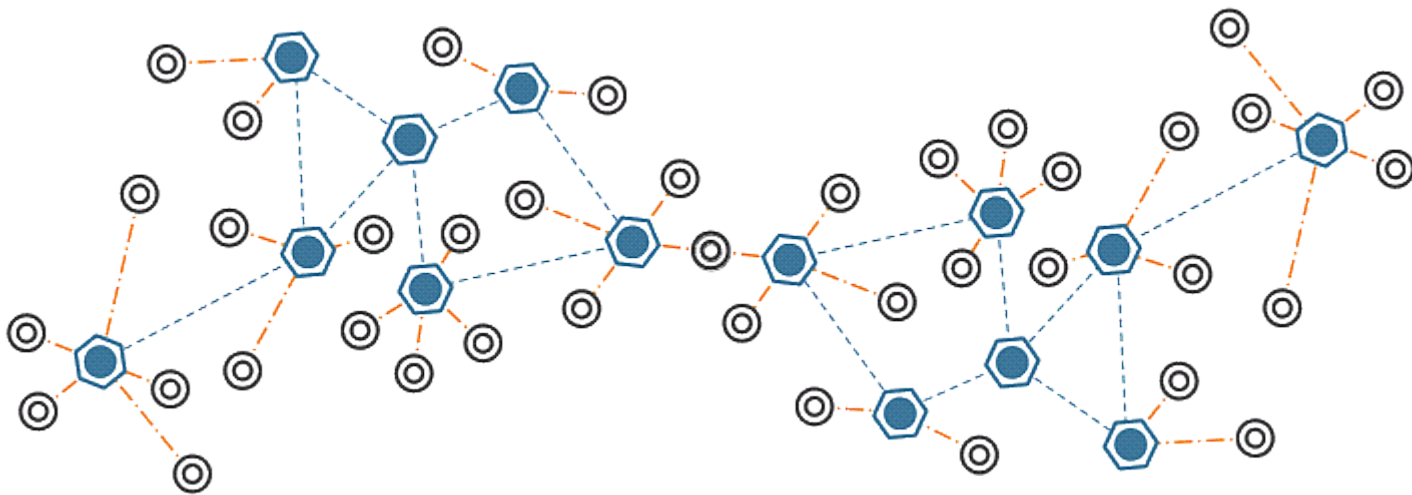
```
Station xx:xx:xx:xx:xx:xx  
rx packets: 400605  
tx packets: 225023  
tx failed: 3  
rx drop misc: 2641  
signal: -48 dBm << This is your RSSI reading!  
tx bitrate: 72.0 MBit/s
```





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# Question and Answer



# THANK YOU.