

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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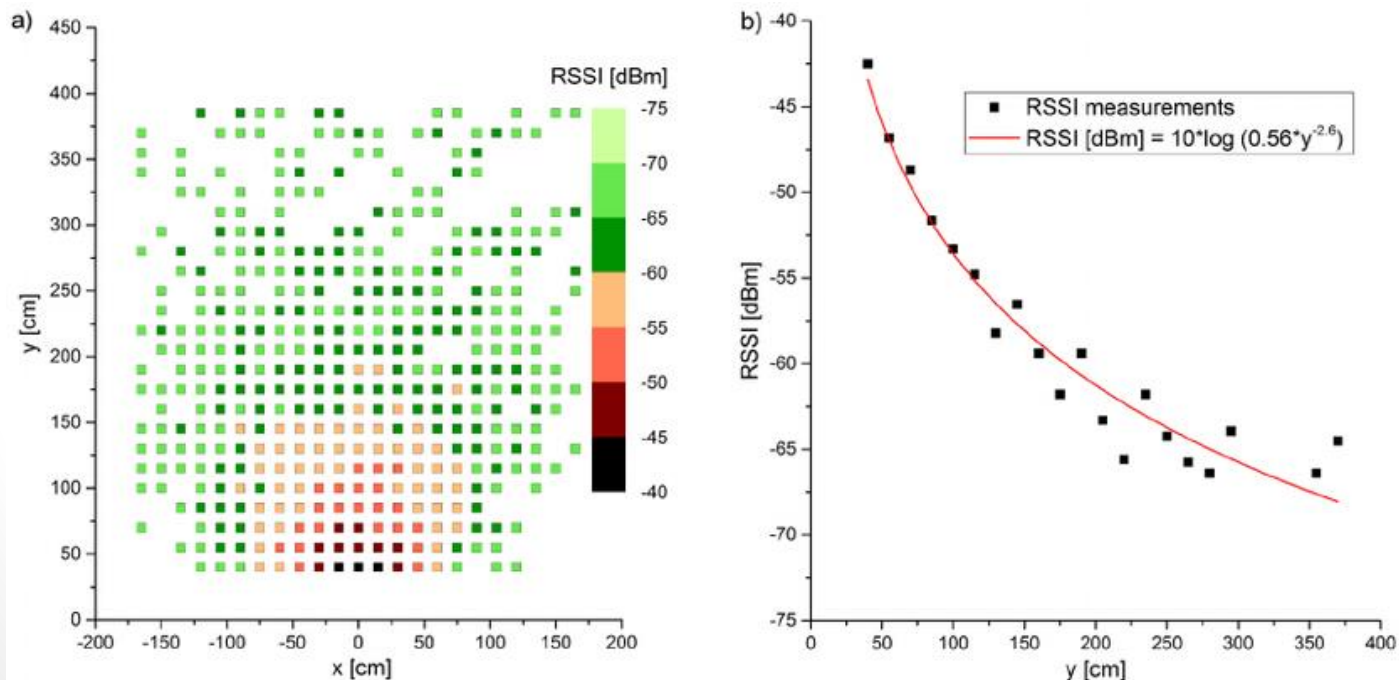
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 i649e change guide		Latest commit d61ffe8 3 minutes ago
 Project	add example	14 days ago
 Chapter_06_Raspberry_Pi_3_Model_B_Getting_Started_Guide.pdf	change guide	3 minutes ago
 README.md	Update README.md	14 days ago

Received Signal Strength Indication (RSSI)

RSSI indicates the power present in a received radio signal.





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
```



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

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



Find n (Path Loss Exponent) of the Environment

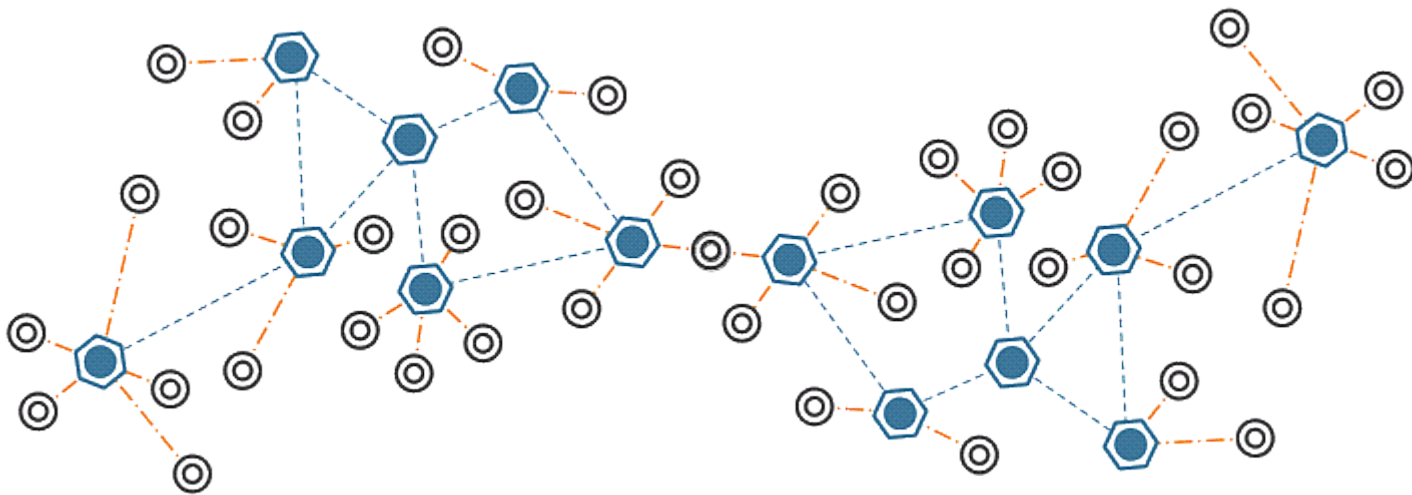
1. Place two raspberry pi according to d_0 value
2. Read RSSI from the device and record it
3. Place two raspberry pi further away from each other ($d = 1-2$ m)
4. Read RSSI from the device and record it
5. Use log distance path loss model to find the path loss exponent n

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.



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Question and Answer



THANK YOU.