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[Announcement]Lab4

↗ ...rrors/suggestions for textbook pre-print chapters.

↗ ...re to attend lectures on-line 10-am-1pm Fridays

↗ Course Outline for 2022 Term 2

> Getting started - Course Outline (VERY IMPORTANT)

> ...edu.au, Jiawei (Gary) Hu [jiawei.hu@unsw.edu.au]

> Individual Term Project

> Week 1 Lecture [03 JUN]: Wireless Fundamentals I

> Week 2 Lecture [10 JUNE]: Wireless Fundamentals II

> ... basics + Mainstream WiFi (802.11a/g/n/ac/ax/be)

> ...ecture [24 June]: Niche WiFi (802.11af/ah/ad/ay)

> Week 5 Lecture [01 July]: Bluetooth

> Week 6 [05 July]: NO Lecture/Quiz/Lab

> Digital Assessment (Inspira) Resources for Students

> COMP3141-5226_00165

> SENG3011-5223_00891

> COMP2111-5223_00559

> COMP3411-COMP9814-5223_00183

> SENG2011-5219_00788

> COMP3311-5219_00177

More...

LAB Discussion Forum

[Announcement]Lab4

↗ Signal strength value

Display replies in nested form

[Announcement]Lab4

by Jiawei Hu - Tuesday, 21 June 2022, 3:22 PM

Hi All,

I noticed that some of you had troubles on lab 4 with getting the frequency and RSSI value in dBm. The following might be helpful:

1. If you can't get the frequency (i.e., 2.4GHz or 5GHz), please use the tables in this website to find out the corresponding frequency based on your channel number:

<https://www.electronics-notes.com/articles/connectivity/wifi-ieee-802-11/channels-frequencies-bands-bandwidth.php>

2.4 GHz Wi-Fi channel availability

In view of the differences in spectrum allocations around the globe and different requirements for the regulatory authorities, not all the WLAN channels are available in every country. The table below provides a broad indication of the availability of the different Wi-Fi channels in different parts of the world.

2.4 GHZ WI-FI CHANNEL AVAILABILITY

CHANNEL NUMBER	EUROPE (ETSI)	NORTH AMERICA (FCC)	JAPAN
1	✓	✓	✓
2	✓	✓	✓
3	✓	✓	✓
4	✓	✓	✓
5	✓	✓	✓
6	✓	✓	✓
7	✓	✓	✓

2. If you get your signal strength in mB (percentage), you can convert it to dBm by:

```
// Quality to dBm.
if(quality <= 0)
    dBm = -100;
else if(quality >= 100)
    dBm = -50;
else
    dBm = (quality / 2) - 100;
```

Re: [Announcement]Lab4

by Jiawei Hu - Wednesday, 22 June 2022, 11:09 AM

Moreover, for the distance equation calculation, be careful with the unit. Here is one example:

```
K = 32.44
FSPL = Ptx - CLtx + AGtx + AGrx - CLRx - Prx - FM
d = 10 ^ (( FSPL - K - 20 log10( f ) ) / 20 )
```

Permalink Reply

Here:

- K - constant (32.44, when f in MHz and d in km, change to -27.55 when f in MHz and d in m)
- $FSPL$ - Free Space Path Loss
- Ptx - transmitter power, dBm (up to 20 dBm (100mW))
- $CLtx$, $CLRx$ - cable loss at transmitter and receiver. dB (0. if no cables)

- AGtx , AGrx - antenna gain at transmitter and receiver, dBi
- Prx - receiver sensitivity, dBm (down to -100 dBm (0.1pW))
- FM - fade margin, dB (more than 14 dB (normal) or more than 22 dB (good))
- f - signal frequency, MHz
- d - distance, m or km (depends on value of K)

Note: there is an error in formulas from TP-Link support site (missing \wedge).

Substitute Prx with received signal strength to get a distance from WiFi AP.

Example: $\text{Ptx} = 16 \text{ dBm}$, $\text{AGtx} = 2 \text{ dBi}$, $\text{AGrx} = 0$, $\text{Prx} = -51 \text{ dBm}$ (received signal strength), $\text{CLtx} = 0$, $\text{CLrx} = 0$, $f = 2442 \text{ MHz}$ (7'th 802.11bgn channel), $\text{FM} = 22$. Result: $\text{FSPL} = 47 \text{ dB}$, $d = 2.1865 \text{ m}$

You can also calculate the distance by yourself (Thanks for the provider Wenyao):

$$\frac{d}{f^4 \pi} = 10^{-\frac{\text{FSPL}}{20}}$$

$$d = \frac{4 \cdot 10^{-\frac{\text{FSPL}}{20}} \cdot f^4}{\pi}$$

Assignment Project Exam Help

<https://powcoder.com>

Add WeChat powcoder

Really sorry for the unclear instruction on Lab4 exercise

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◀ Signal strength value

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Page last updated Wednesday 25 May 2022

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