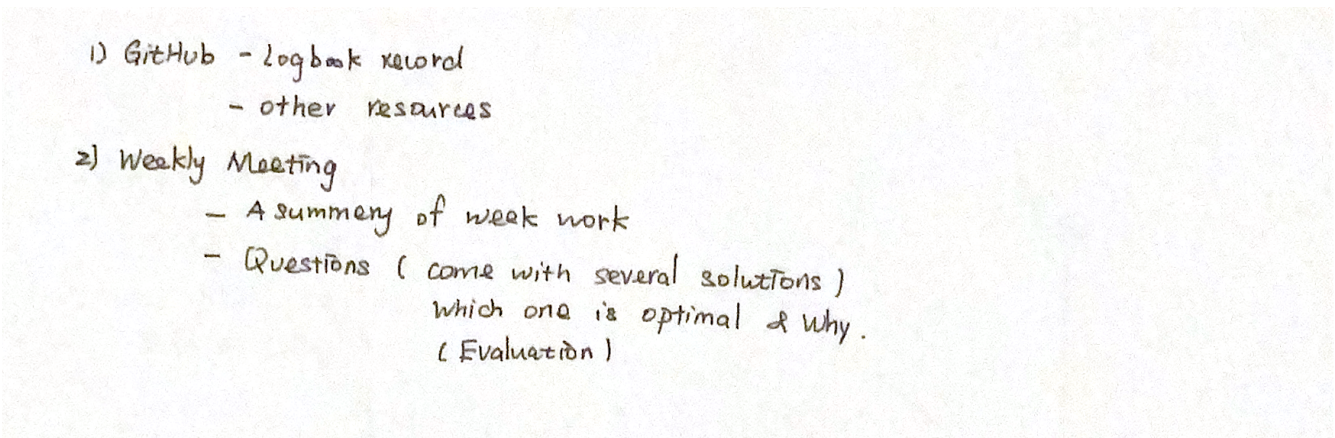
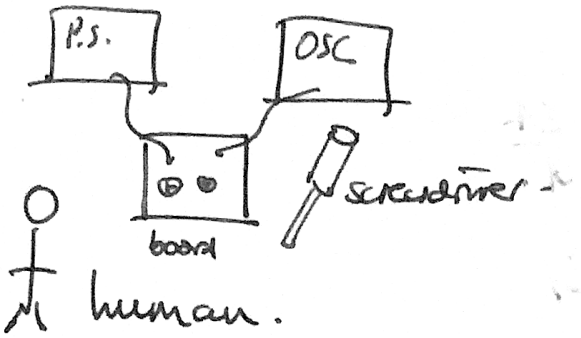
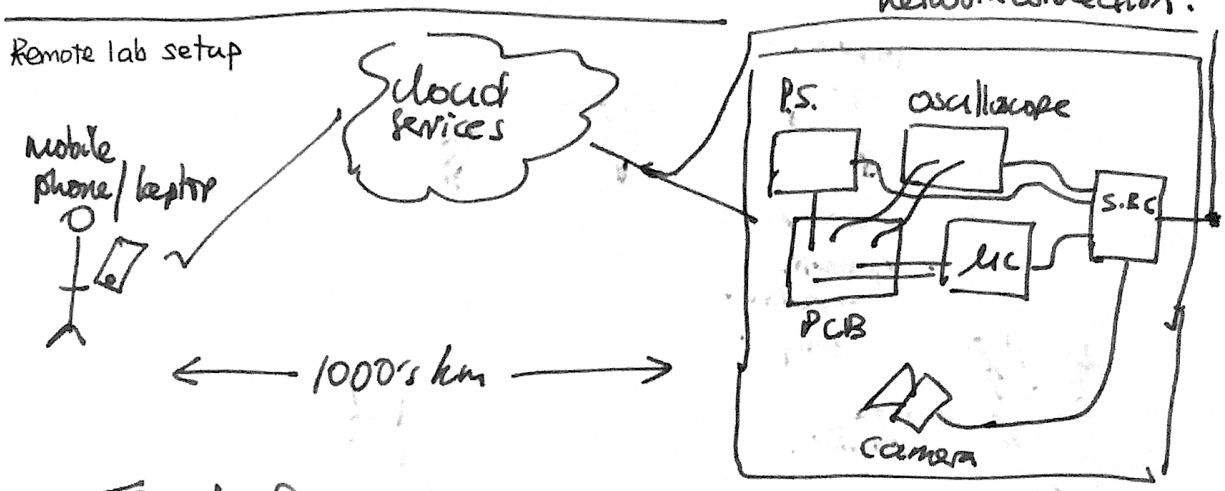
Minutes of 6/13 meeting:

1, Architecture of a remote lab: Could Service -> Odroid-C4 (Single board computer) -> { NanoIOT33 (Microcontroller), Oscilloscope, Power Supply, PCB Board}.
2, User controllable parameter: Oscilloscope, Power Supply, Variable elements on PCB Board (includes resister, capacitor and inductor).
3, Variable elements: Digital potentiometer (resistor); Varactor(capacitor).
Decision that need to be made:
A, decide to use which device to achieve this;
B, Tuning range for user(safe range);
C, Available to buy.
4, Safe range for variable elements: control theory. (manufacturing variations, EMC problem, etc).
5, Check on similar remote lab project on GitHub - Code for NanoIOT33.
6, Finish Mission Statement this week.

Goal of this week (6/13-6/19):
1, Mission Statement
2, Laboratory passport signed
3, Buck Converter - Study (circuit operation, data sheets, parameter selection, layout)
4, Variable elements - Resistor - device selection (data sheet)







JSON format message.

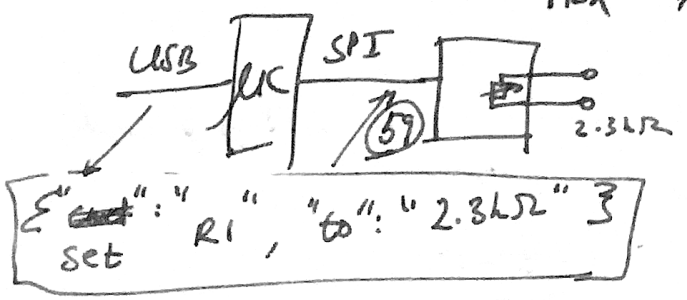
{"cmd":"____", "params":["x":"____"
"y":"____"]}

digital potentiometer.

- Odroid C4
- nanoIOT 33

MCP413X 7bit/8bit.

5, 10, 50, 100kΩ. ① what capacitance tuning range do you need?



10kΩ.

2.3k/10k × 255 = ~~254~~ 59

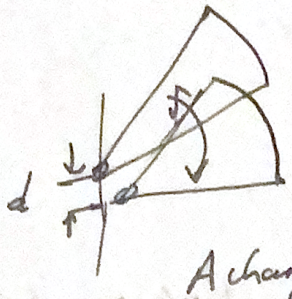
0-255 = 256 (8bit)

variable capacitance ② what is available to buy?

→ physical tunable capacitor

→ varactor

→ ?? tunable capacitor STATIC-8264

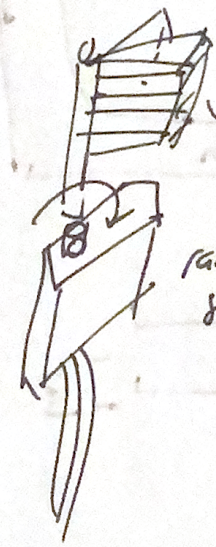


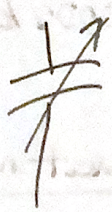
$C = \frac{\varepsilon A}{d}$.

A changes, d is fixed.

top view.

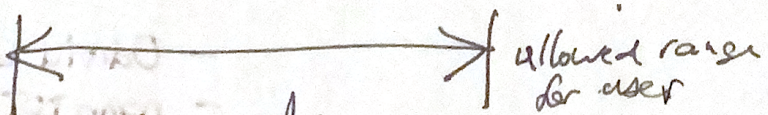
overlap → proxistic capacitance only.

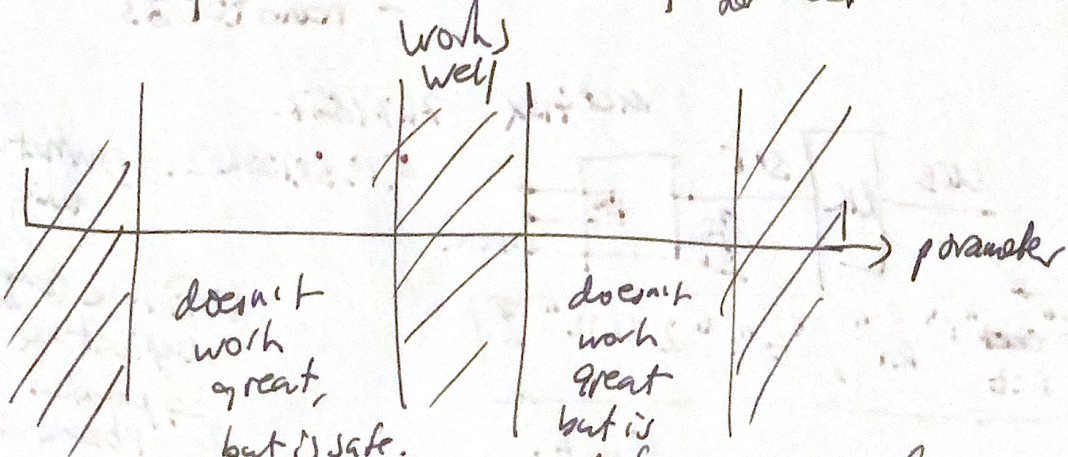


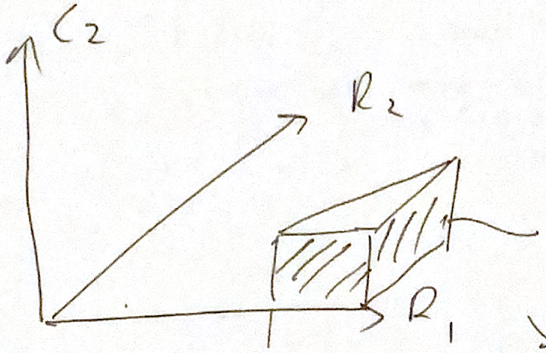


Colin Caesar.

How do you achieve that?







N-dimensional space of possible parameters.

unsafe.

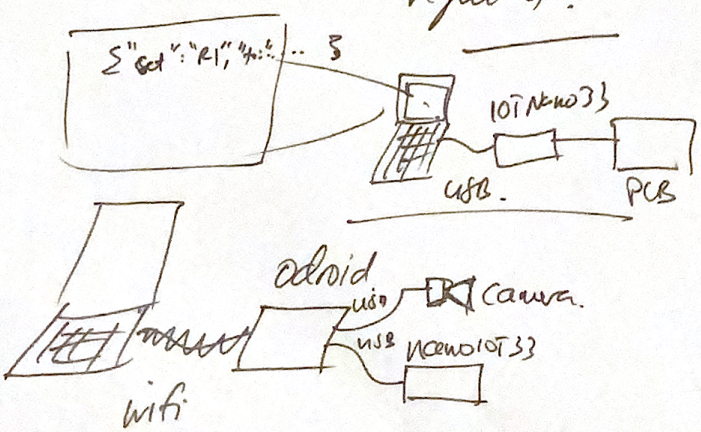
↘ EMC problem
– avoid by good design
(but not require to do emc evaluation)

example in 3D.

on chip power supply – must handle manufacturing variations.

million's of chips ⇒ lots of variation!

⇒ "analogue" student provides variation.
→ same fundamental understanding required!



github.com/practable/pendcino/blob/master/sketch/sketch.ino.