Explore our Earth from horizon above

ARKLAB _ Ruby Huang

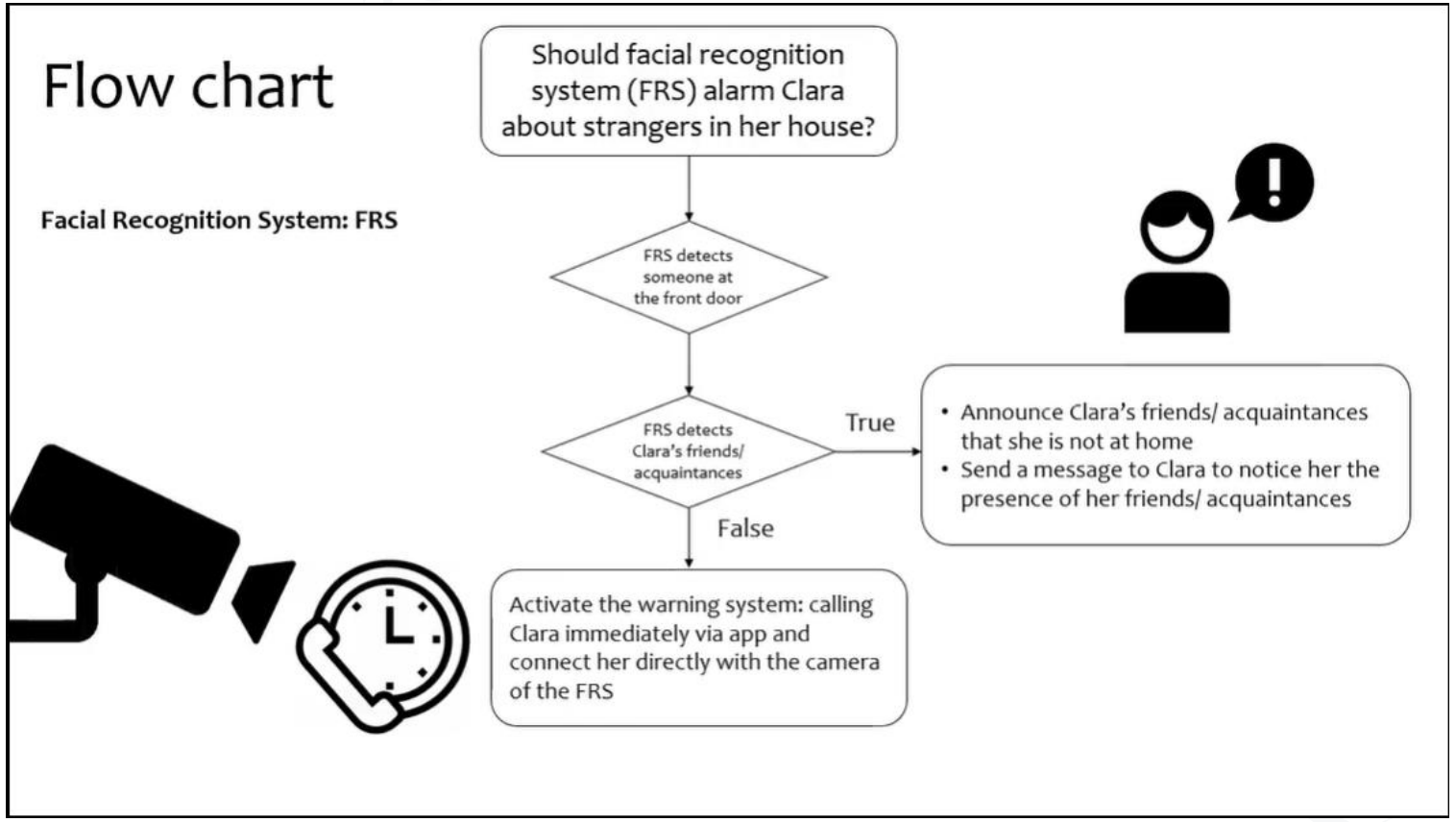
Ruby Huang

HJUAV- Marketing executive

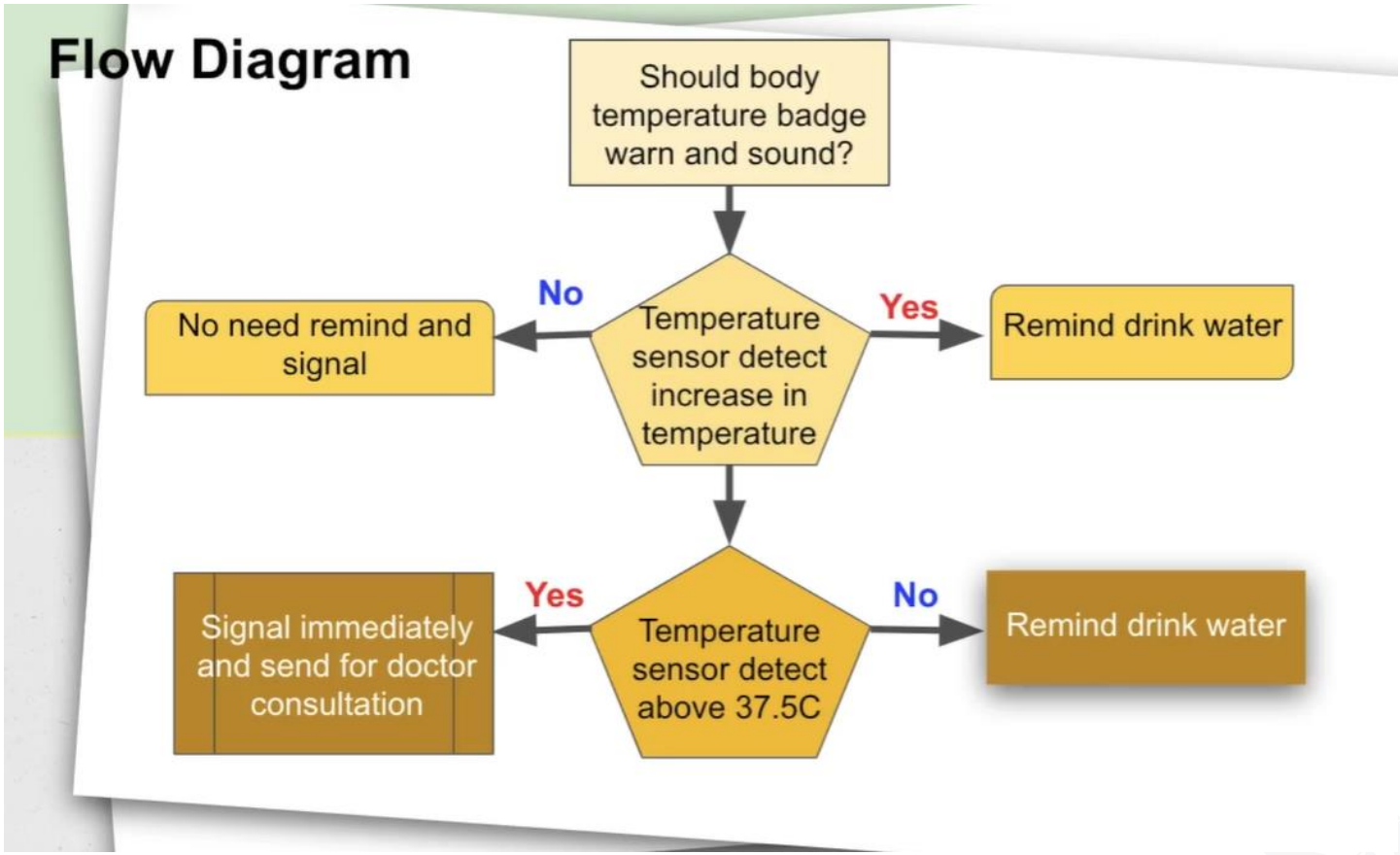
Feng Chia University, Taiwan – BIBA
La Rochelle Business School – Master in M.S.C.

Arklab Academy - Lecturer
Oral Art Course – Lecturer
C.D.I.O Initiative - Teaching assistant

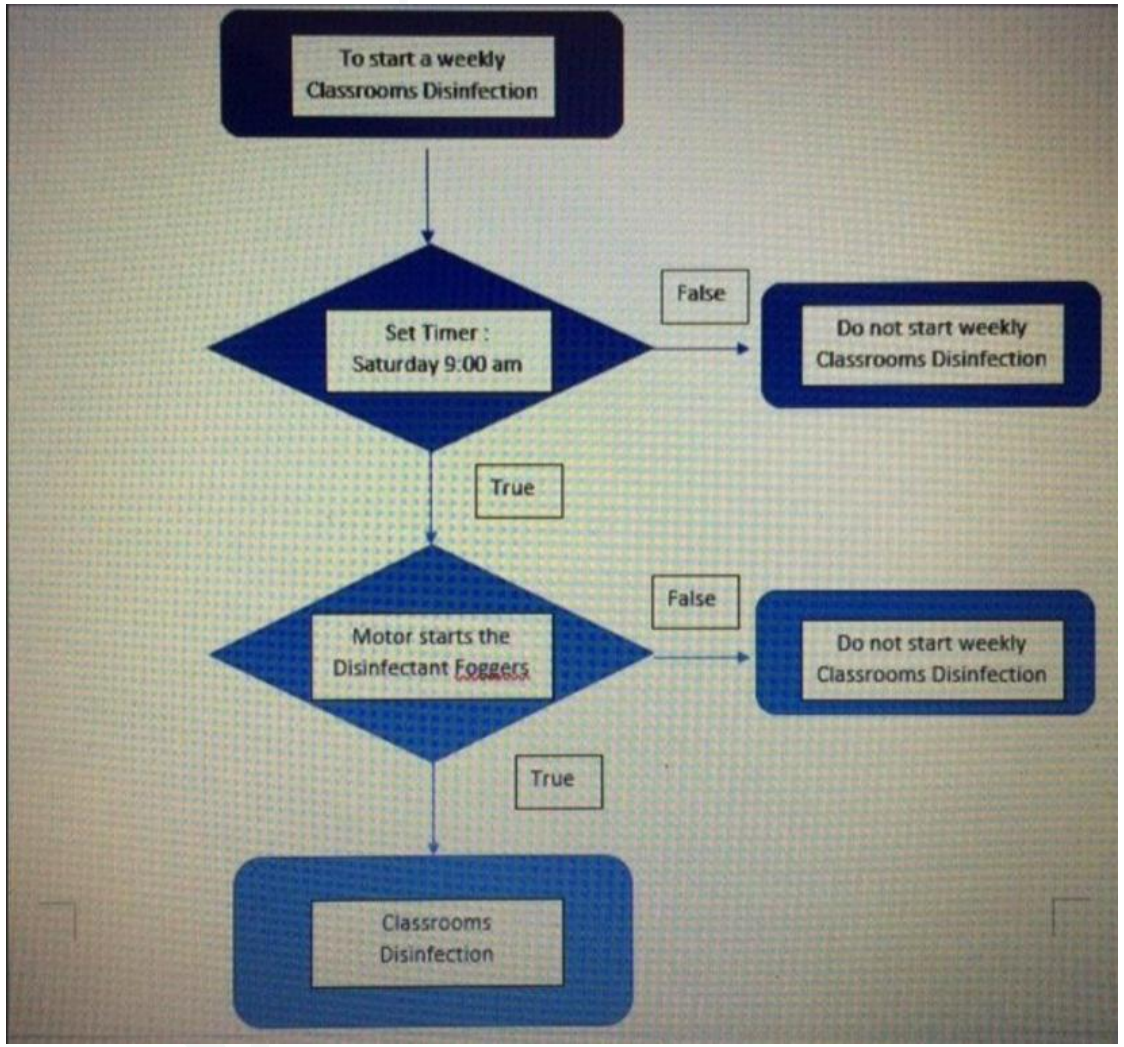
Thành Nhơn


Flow chart
Facial Recognition System: FRS
Should facial recognition system (FRS) alarm Clara about strangers in her house?
FRS detects someone at the front door
FRS detects Clara's friends/ acquaintances
True
• Announce Clara's friends/ acquaintances that she is not at home
• Send a message to Clara to notice her the presence of her friends/ acquaintances
False
Activate the warning system: calling Clara immediately via app and connect her directly with the camera of the FRS

Angeline Chong Lh



Jew An


To start a weekly Classrooms Disinfection
Set Timer : Saturday 9:00 am
False
Do not start weekly Classrooms Disinfection
True
Motor starts the Disinfectant Foggers
False
Do not start weekly Classrooms Disinfection
True
Classrooms Disinfection

Courses outline

Monitoring Environment Change with Drone Technology

I

Part 1. Drone DIY

Part 2. Hands on UAV

0

Part 3. UAV Application

Part 4. UAV v.s. SDGs

Quiz 1. What is the “C”of CDIO stands for?

(A) Conceive

(B) Create

(C) Catch

(D) Communication

Please complete in Corelab

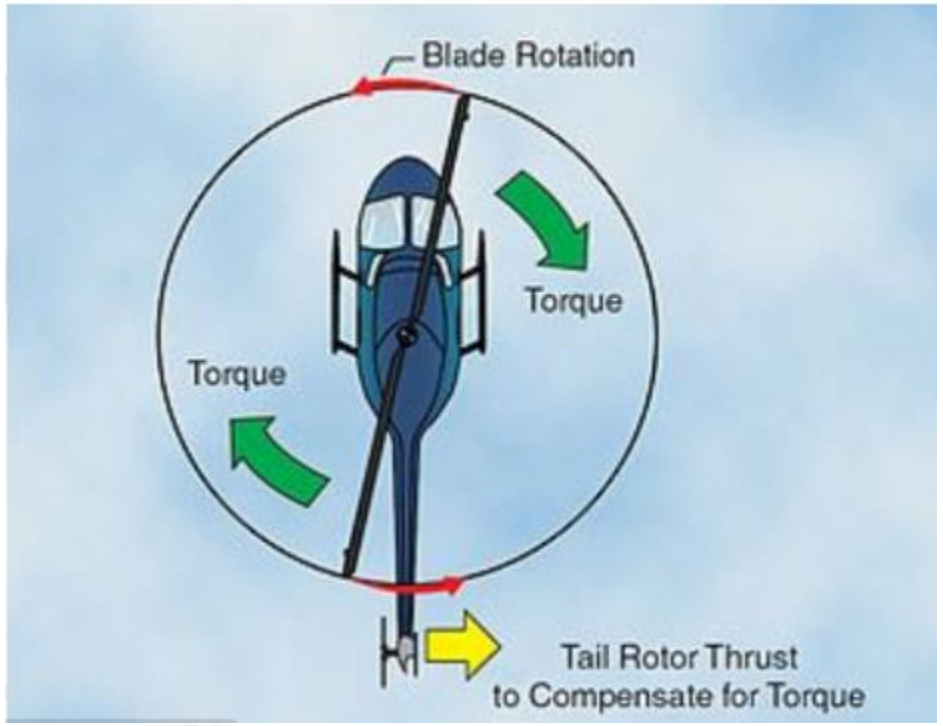
III. Hands on UAV & drone DIY

Part 1. Drone DIY

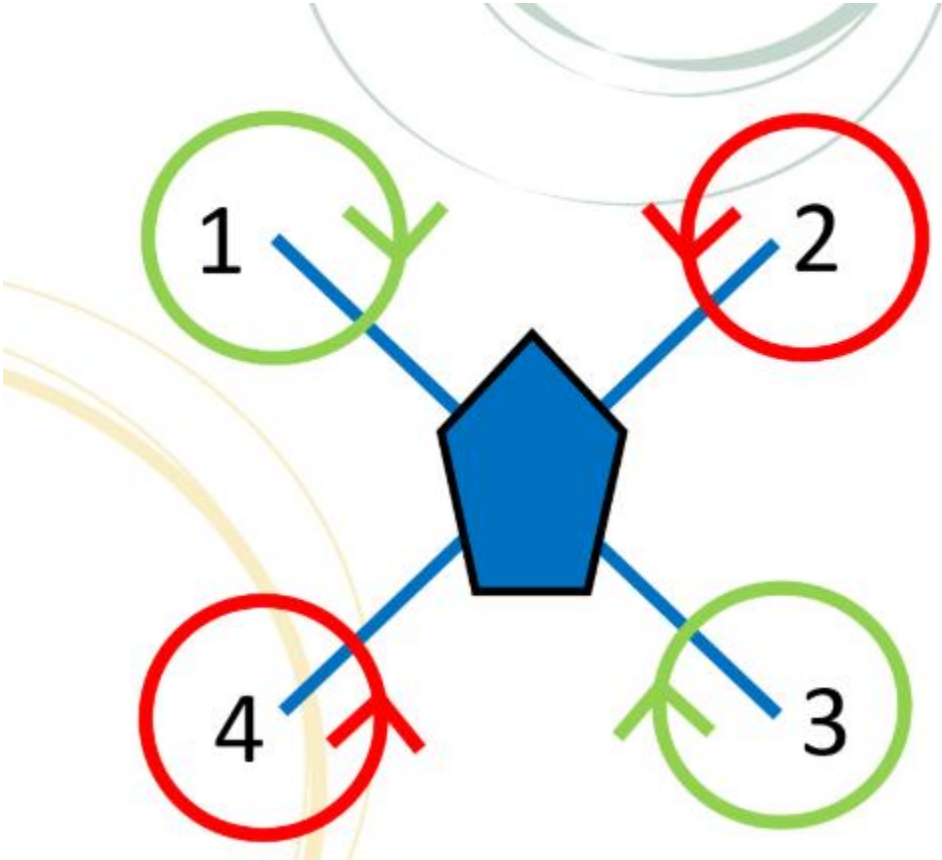
Flight attitude

Helicopter

- Lift
- Torque
- Rotation



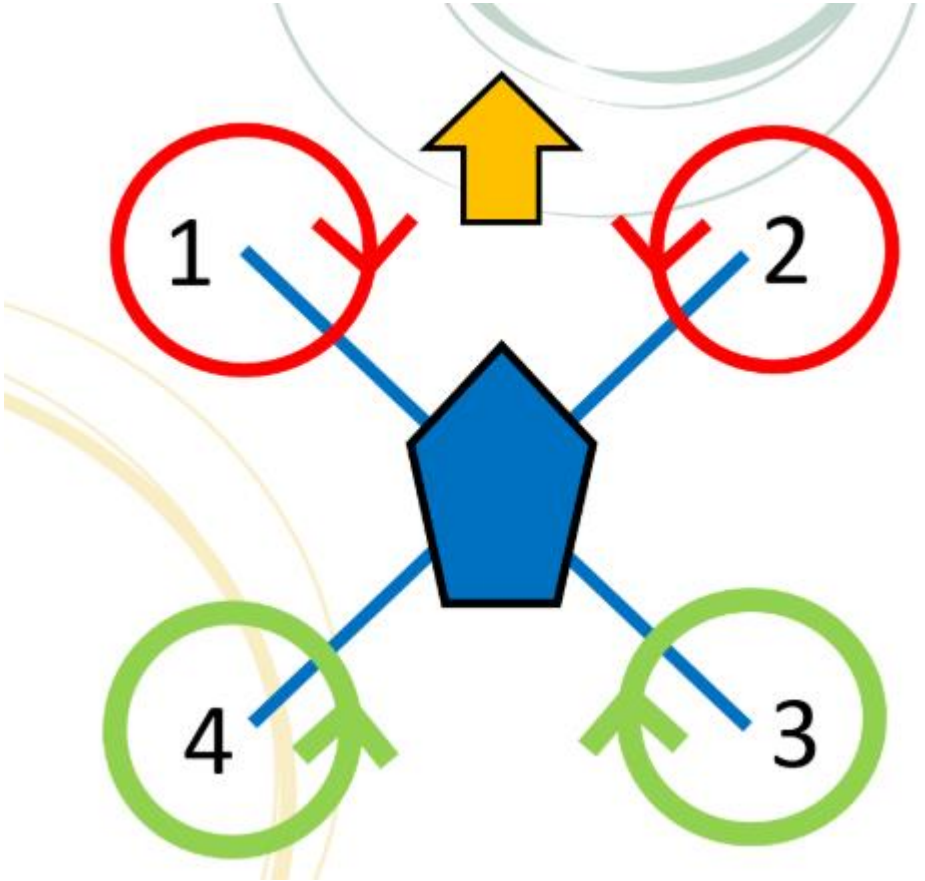
Flight attitude



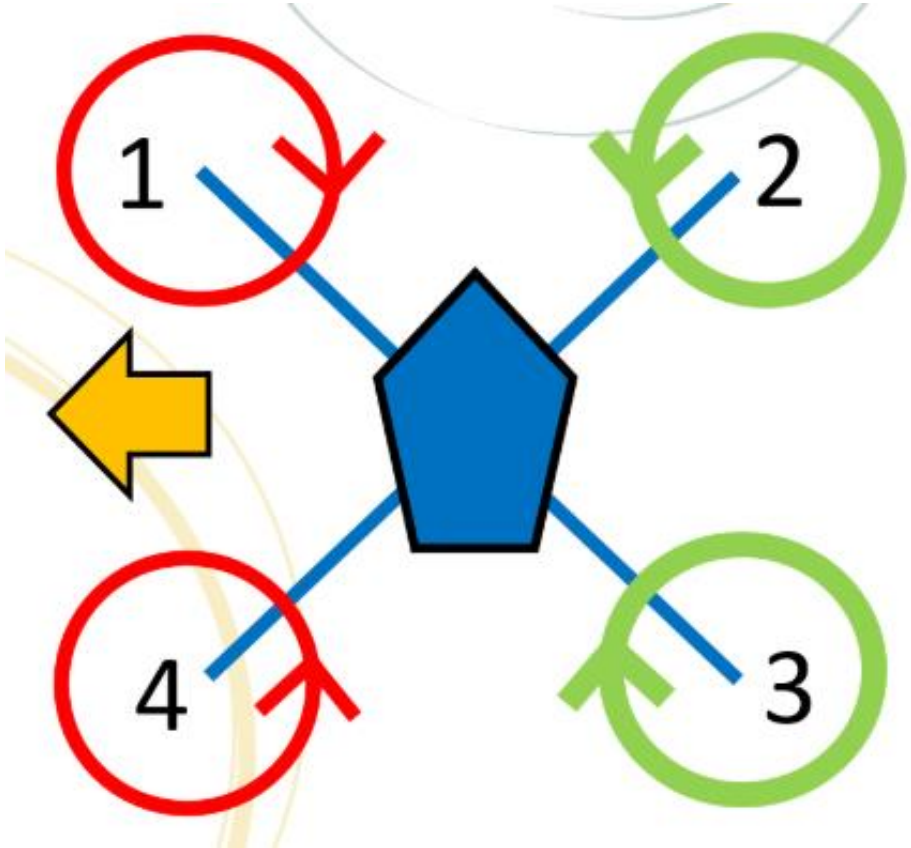
Quadcopter

- Four axis
- Vertical takeoff and landing (VTOL)
- Clockwise : number 1,3
- Counterclockwise : number 2,4

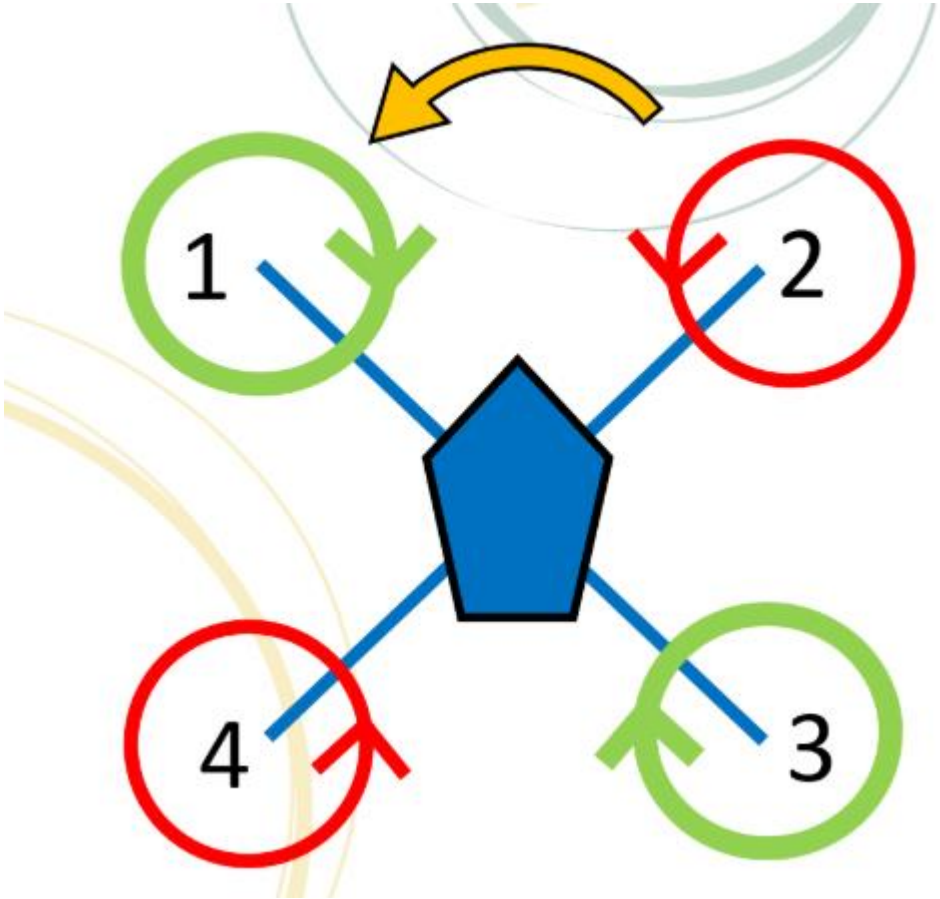
Flight attitude -Pitch



Flight attitude- Roll

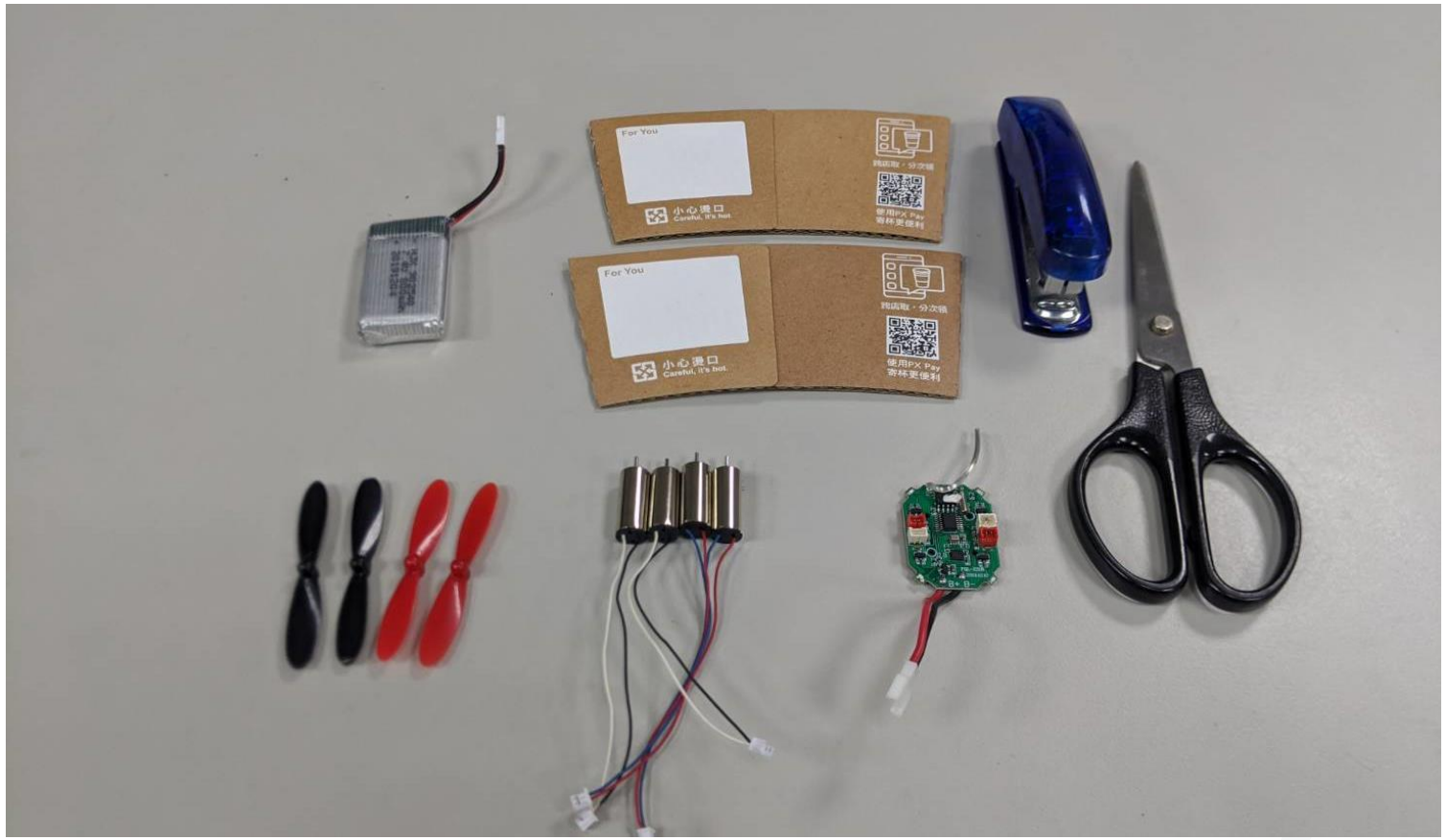


Flight attitude- Yaw



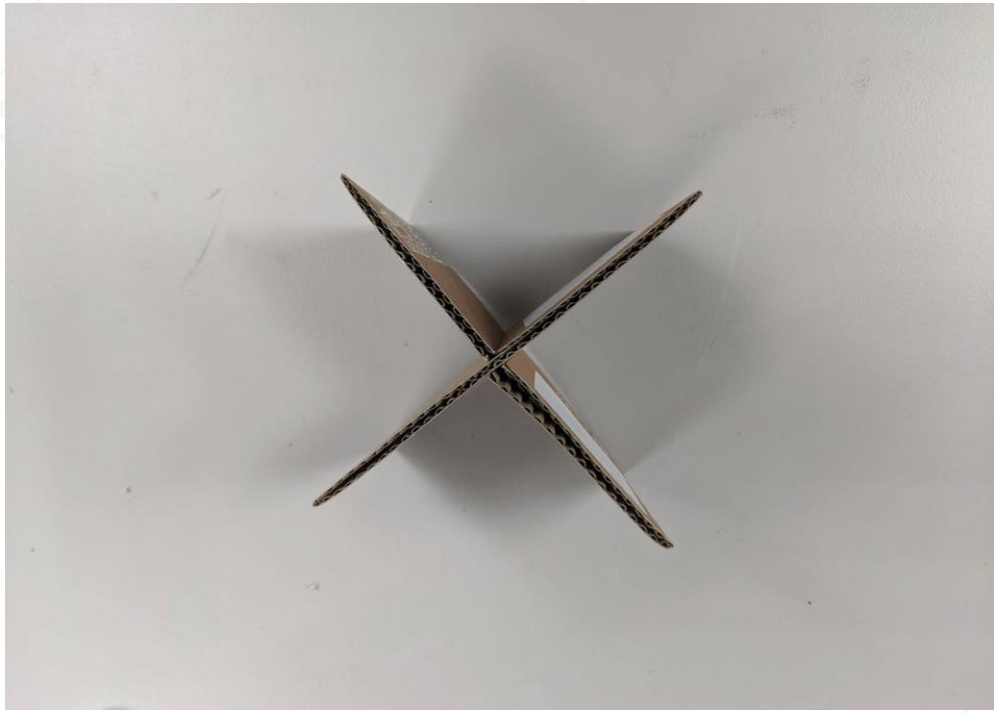
Make your own drone

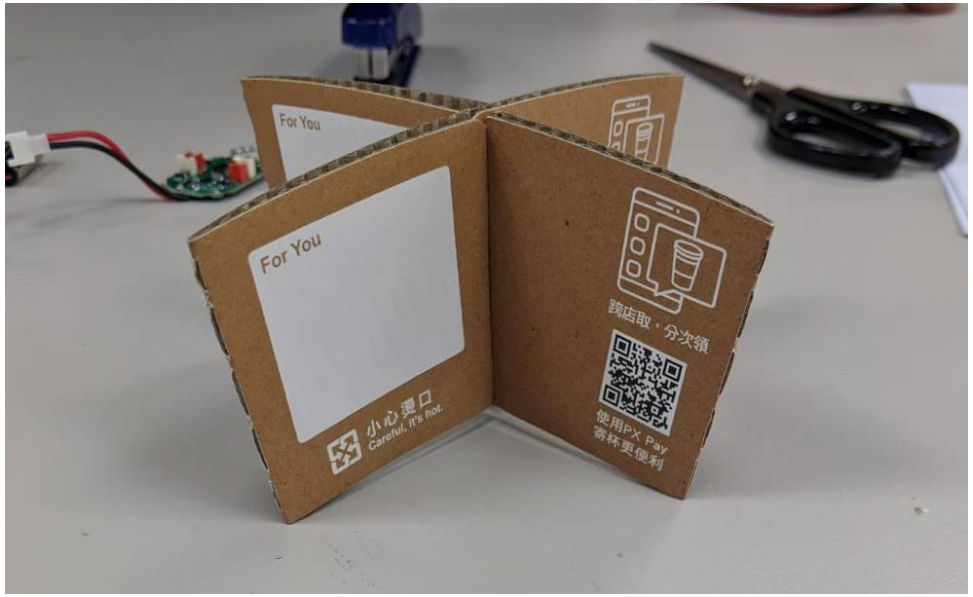
Materials



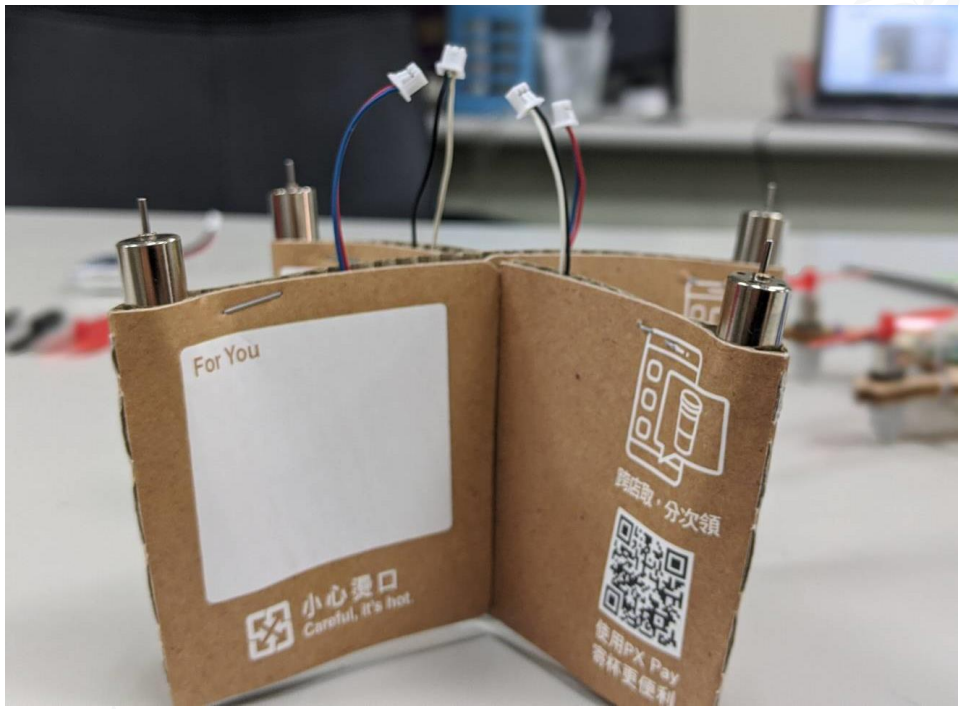
小心燙口
Careful, it's hot.
For You

小心燙口
Careful, it's hot.
For You




For You
For You
跨店取，分次領
小心燙口
Careful, it's hot.
使用PX Pay
寄杯更便利

For You
小心燙口
Careful, it's hot.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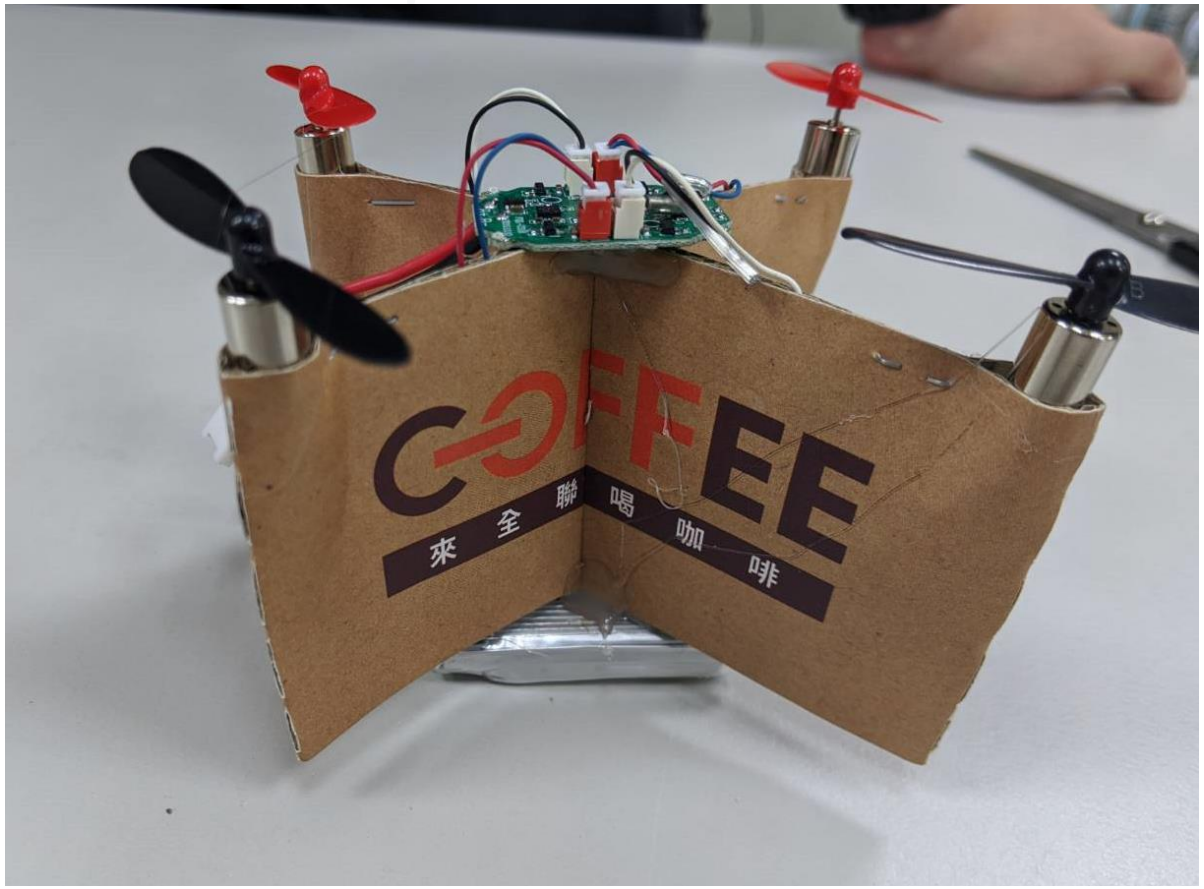

COFFEE
來全聯喝咖啡

ARKLAB

Part 2. Hands on drone

Quiz 2. Which material is necessary when making the DIY drone? (one or more than one answer)

(A) Motor

(B) Paddle

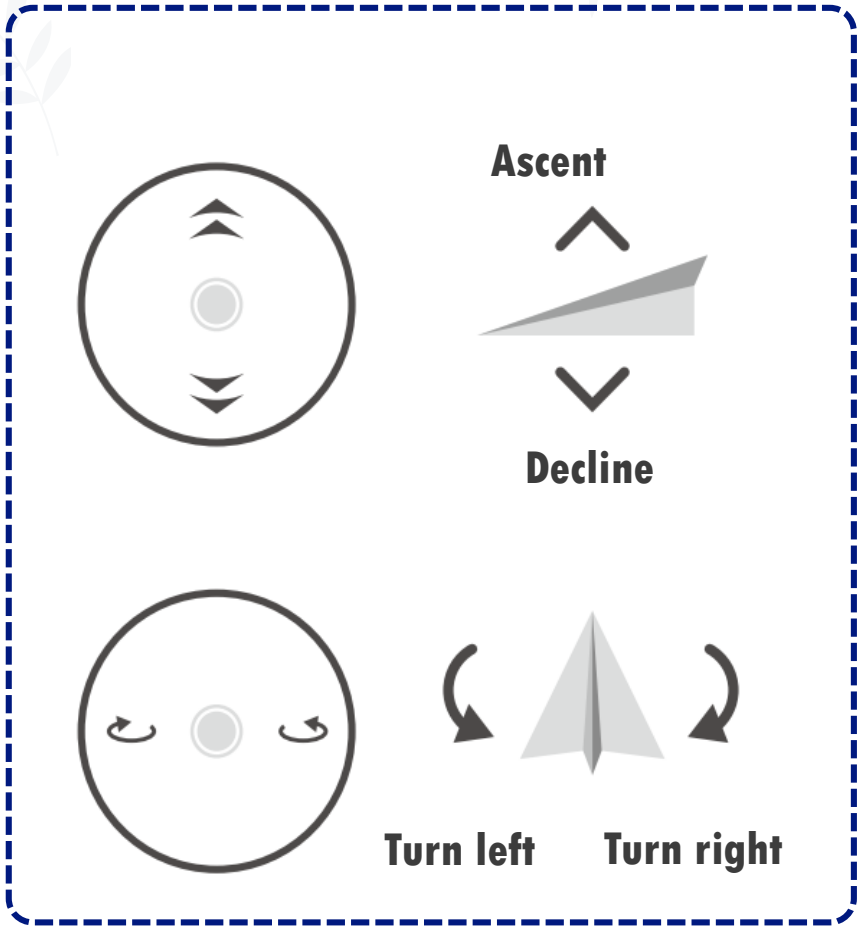
(C) Coffee cups

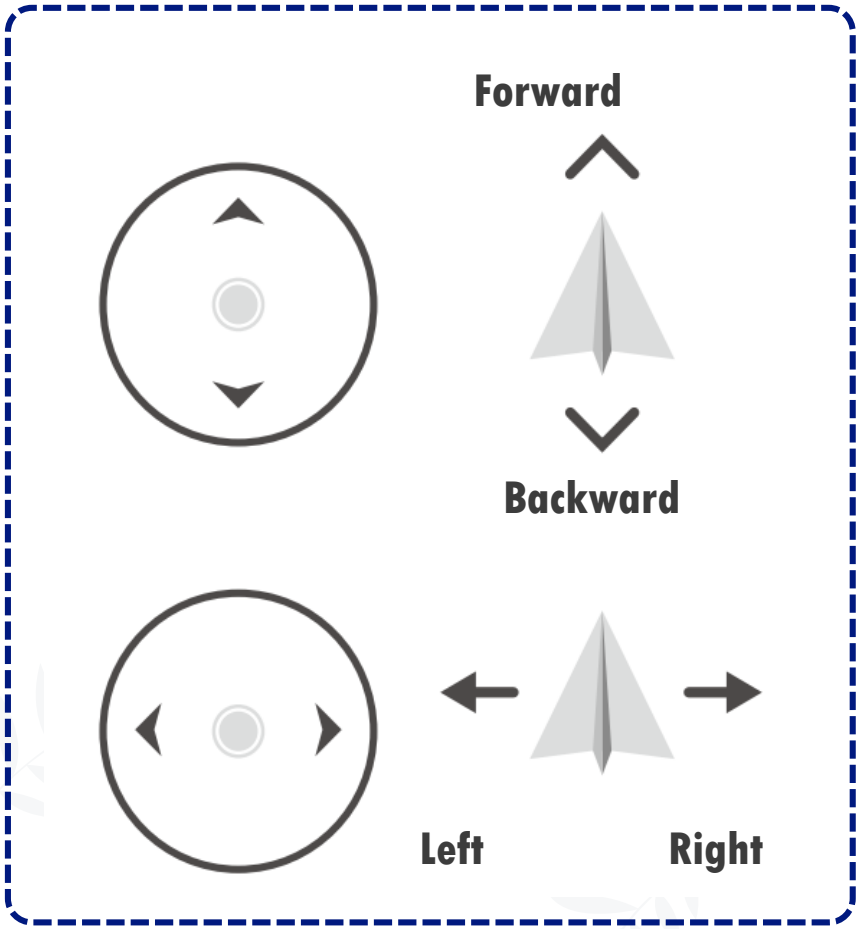
(D) Coffee cover

(E) Battery

Please complete in Corelab

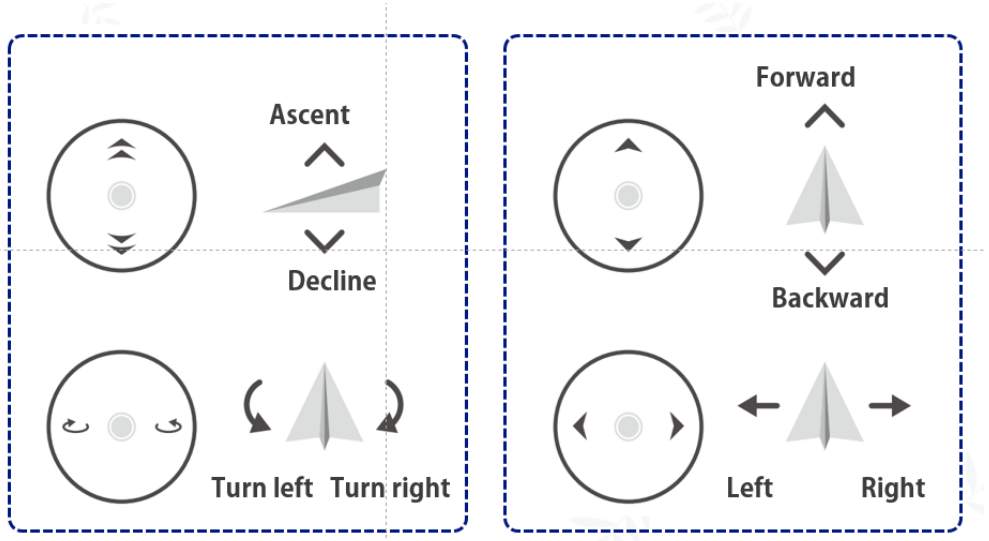
American remote control



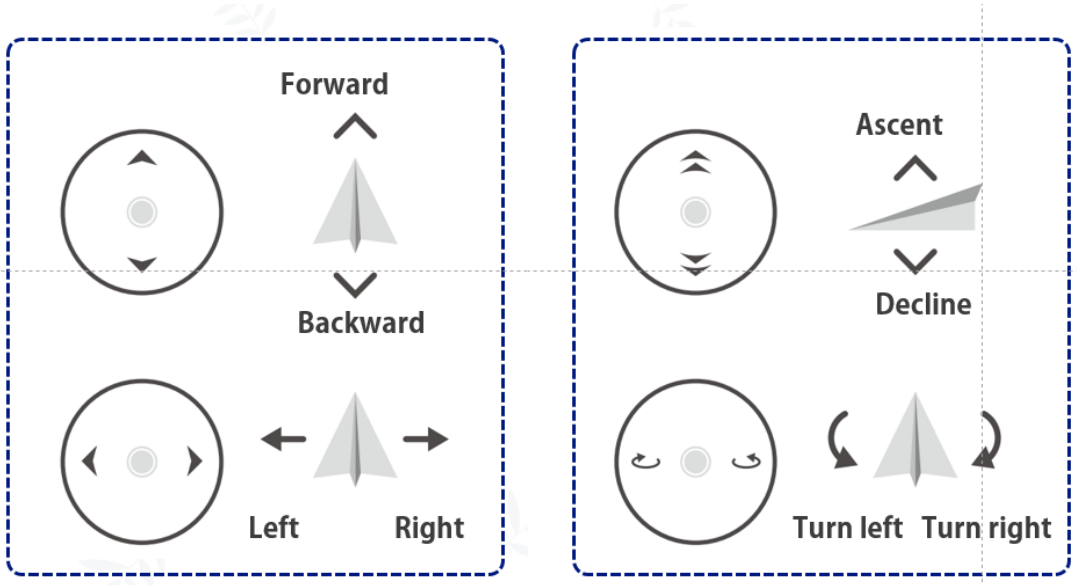


Quiz 3. Which is American remote control?

(A)



(B)



Please complete in Corelab

IV. UAV Application & UAV v.s. SDGs

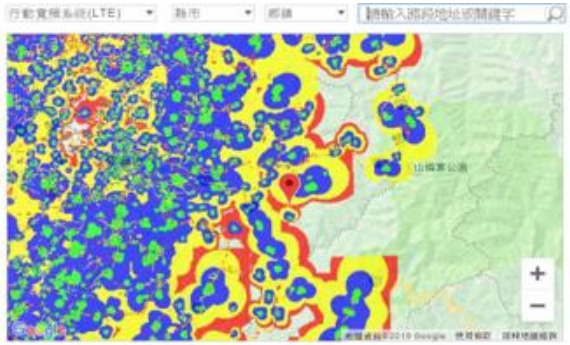
Part 3. UAV Application

Have you ever think about what can drone do in our daily life?

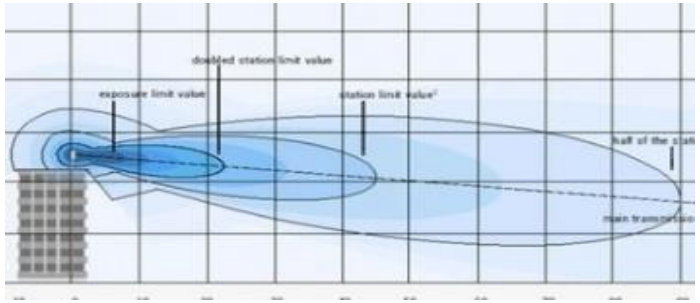
Tower/ Power Line Analyzer

Signal measurement

Spectrum analyzer detects the base station signal and finds the signal abnormal value to replace the antenna device.

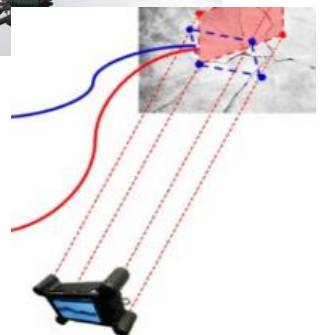


Different signal strength data with elevation and Euler angles presented in space coordinates



Non-destructive testing

Detecting the crack and strength of the base structure through image recognition



Camp detective

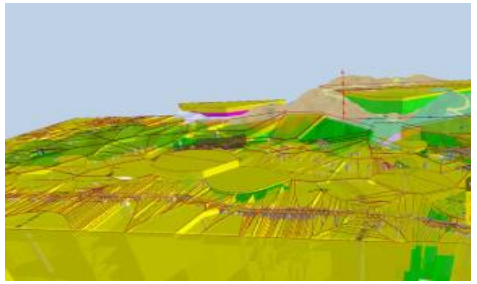
HJUAV detecting system can not only use signal measurement but also use in the area security detective. HJUAV provides the camp or specific area fixed route patrol. With normal camera and thermal camera, the detecting will not bother by day and night.

Multi-drone Forward Observation System

Geology & Natural Resources

Through aerial projection image, system can splice large image for land reclamation or land planning. Moreover, this tech can be used in many industries such as agriculture, mining and so on.

3D Modeling



Fault exploration

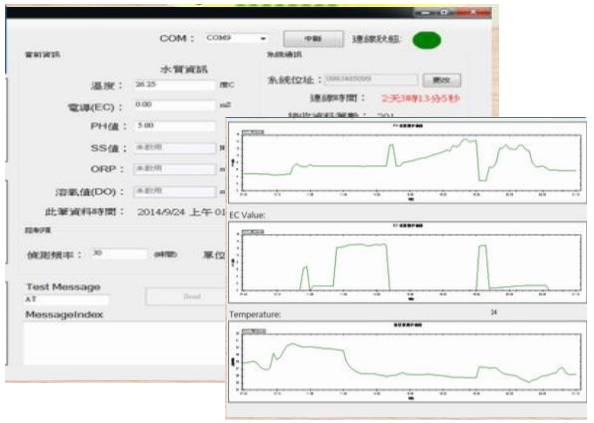
Reservoir construction

Water detection

HJUAV helps reduce the difficulties of pollution detection, especially water testing. Through the UAV system, it helps inspectors get test samples in shorter time and easier way.

Import actual space into system

On site operation

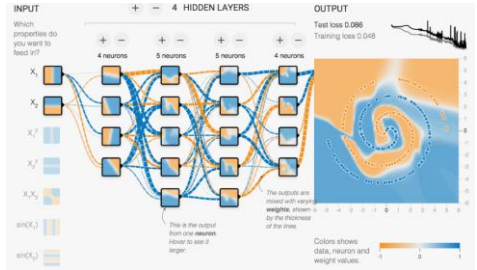


PC platform integration monitor

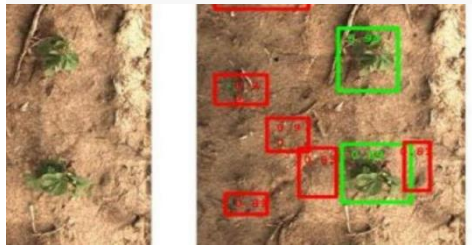
AI Agriculture

WEB/ Server
AIOT+

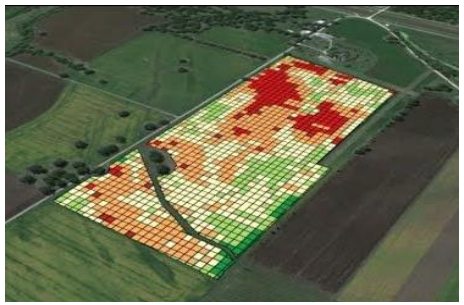
- **Agriculture medication data base**
- **Spraying and monitoring data collection**
- **Flight mission management**



Big Data Analysis



Recognize Algorithm



Joint Pattern Cloud Algorithm

Logistic

HJUAV come over with the difficulties of payload weight. Using heavy payload drone with shelf deliver the goods. Let the delivery easier through the fixed air route.

Medical rescue

HJUAV come over with the difficulties of medical rescue. Using heavy payload drone with shelf and ridge deliver the medicine such as serum. Let the delivery easier through the fixed air route.

Quiz 4. What is the AI Agriculture based on? (one or more than one answer)

(A) Rich agriculture experience

(B) Automatic Sprinkler

(C) Server AIOT

(D) Data analysis

Please complete in Corelab

Quiz 5. What is the directly benefit of using UAV in medical rescue? (one or more than one answer)

(A) Save times

(B) Lower cost

(C) Create more work opportunities

(D) Extend the rescue time

Please complete in Corelab

Part 4. UAV v.s. SDGs

SUSTAINABLE DEVELOPMENT GOALS
17 GOALS TO TRANSFORM OUR WORLD
1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS
SUSTAINABLE DEVELOPMENT GOALS

Sources of Air Pollution

- Industry & Energy Supply
- Transport
- Waste Management
- Dust
- Agricultural Practices
- Household Energy

Real-Time AQI in Jakarta

Jakarta South (US Consulate) AQI: Jakarta South (US Con:

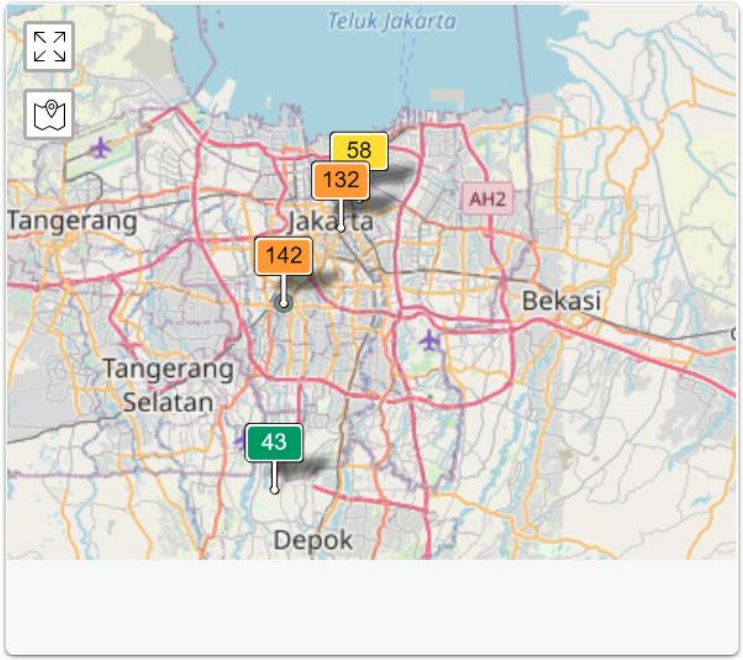
142

Unhealthy
for Sensitive Groups
Updated on Monday 16:00
Temp.: 33°C

	Current	Past 48 hours data	Min	Max
PM2.5 AQI	142	18 Sunday 6 12 18 Monday 6 12	82	182
PM10 AQI	58		33	80

Weather Information

	Current	Past 48 hours data	Min	Max
Temp.	33	18 Sunday 6 12 18 Monday 6 12	26	36
Pressure	1009		1009	1014
Humidity	55		51	82
Wind	4		0	6



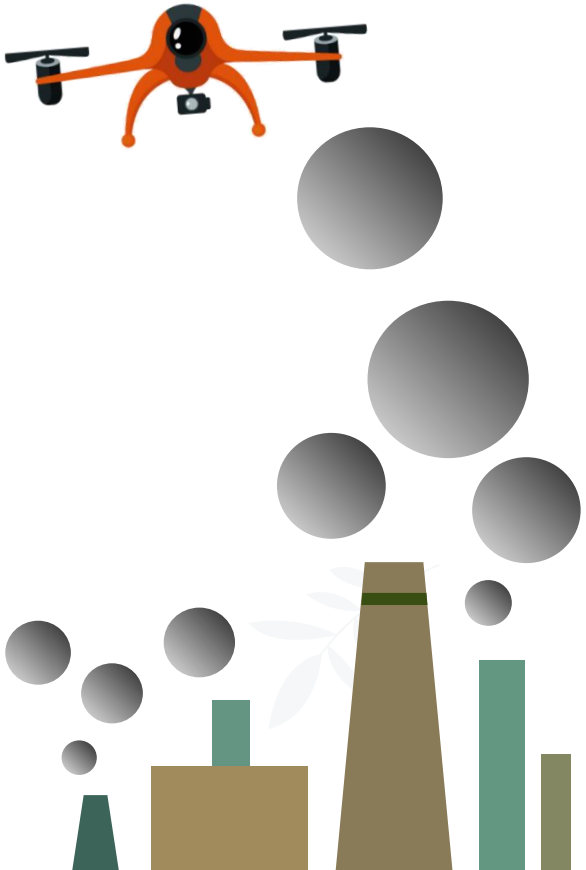
Could Drones Help?

Fight Air Pollution Using Drone

Sniffing out the problem

Polish authorities are using drones equipped with sensors that can evaluate the air's chemical makeup onboard, and in turn fining the offenders who are releasing contaminates.

https://www.thedrive.com/article/11891/tree-planting-drones-could-help-alleviate-c02-emissions



LAB

PM2.5/Air Quality Monitor

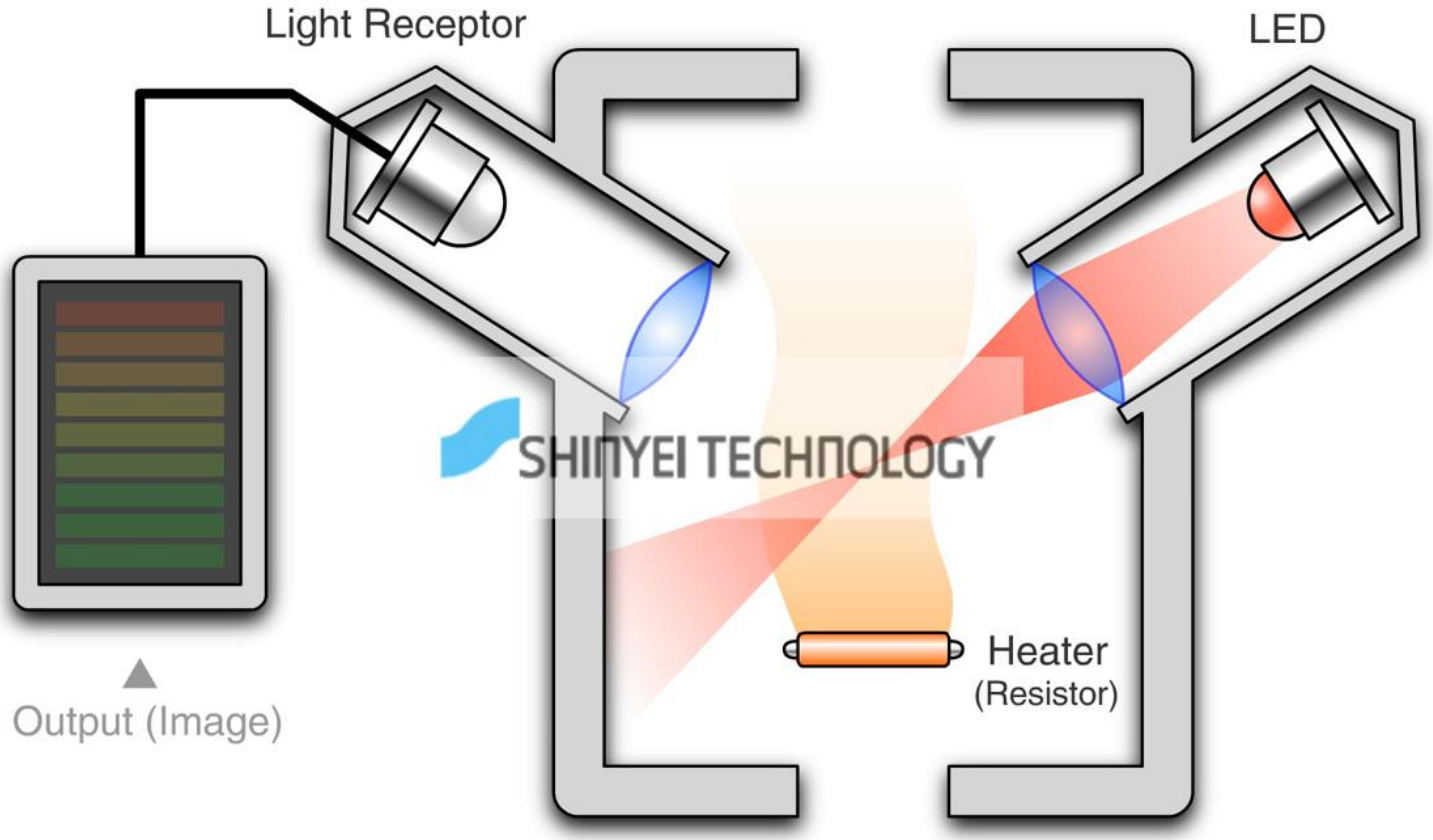
Optical Dust Sensor

The sensor has a tiny six-pin connection interface, it comes with a connector when you usually buy it. The sensor generates an analog output signal on pin5- Vo, it does not require any external components for operation and requires only a 3.3V supply, making it easy to interface with the Arduino board. Some example applications of this sensor include:

Sharp's GP2Y1010AU0F optical dust sensor

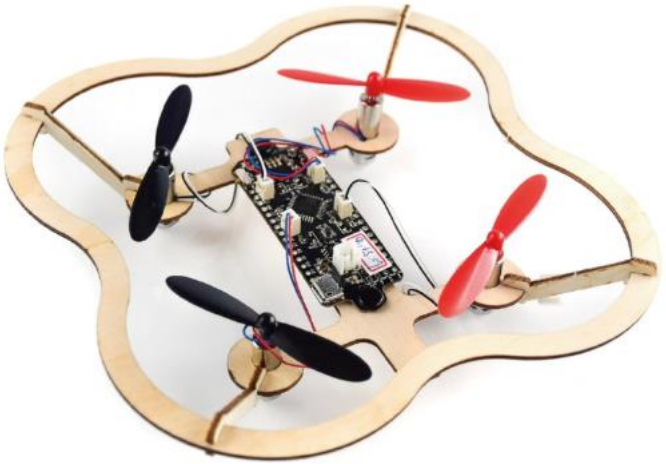
- Air purifier
- Air conditioner
- Air monitor
- PM2.5 detector

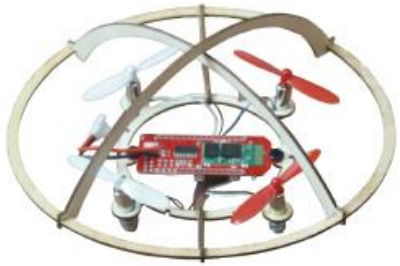
How Dust Sensor Works?



Laser PM2.5 dust sensor

What can UAV do more?





Any Question?

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Thank You !