

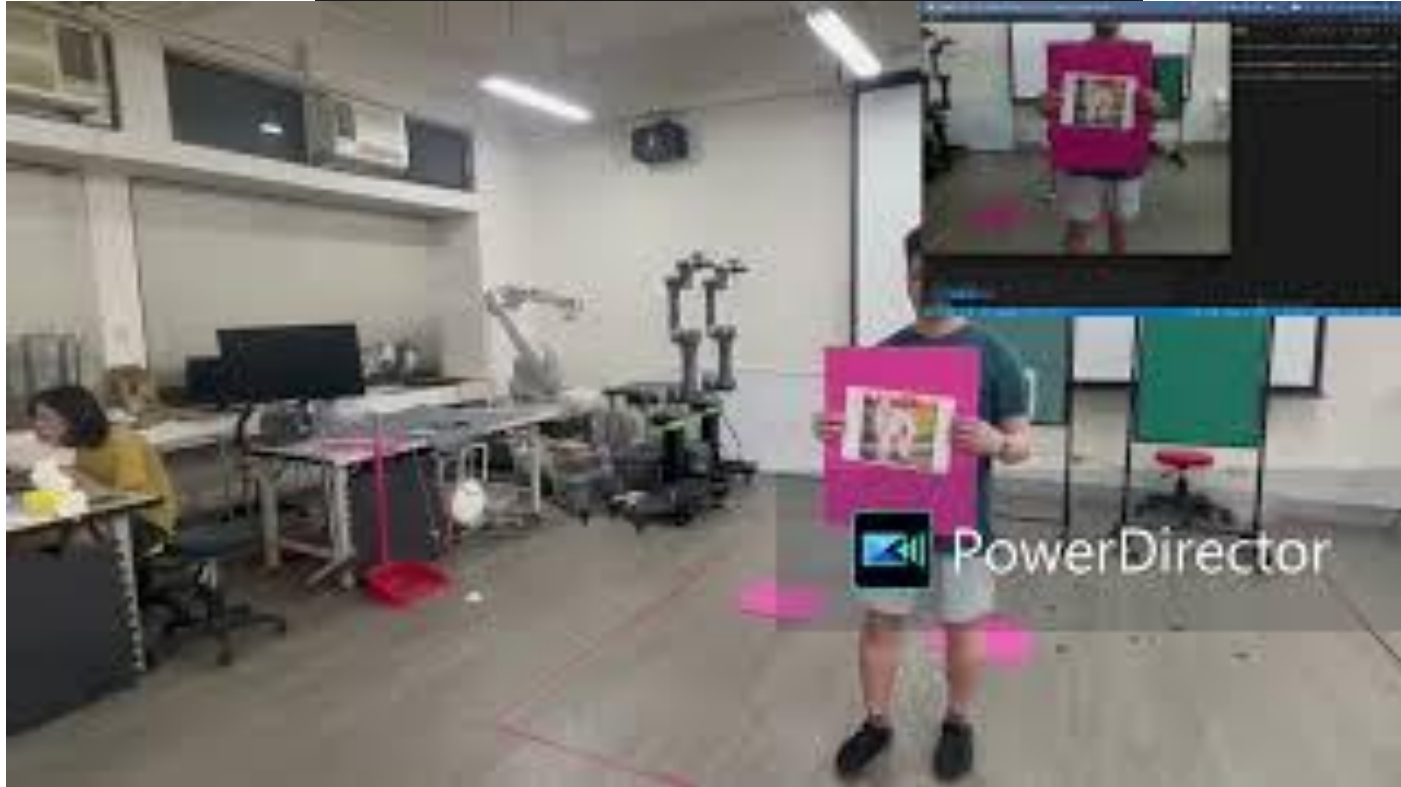
# Final Competition Design

2025/05/29

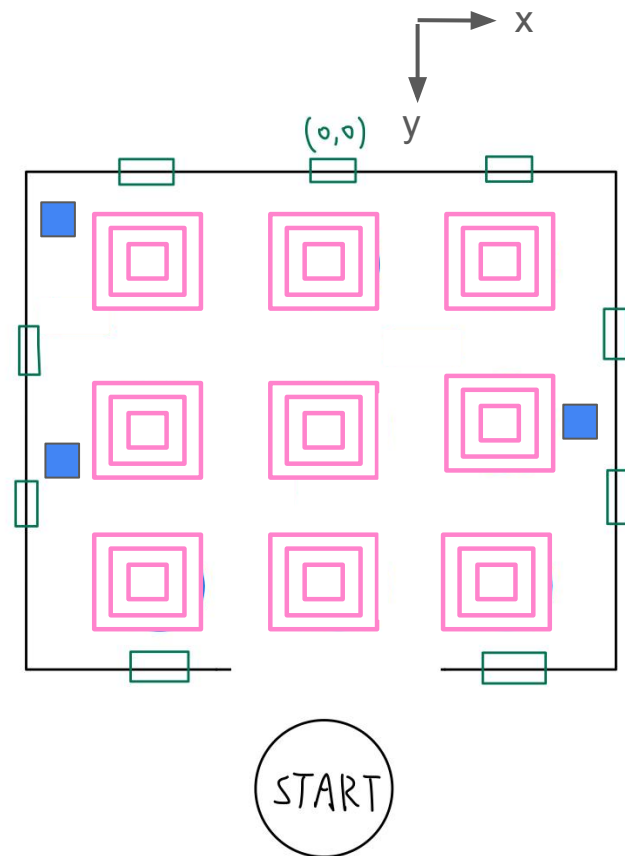
```
Dog is detected!!!!!!  
The landing point would be 4  
Start recognizing tags  
Tag 2 is detected (original)  
Start finding the target tag  
Finding the target tag: 0  
The location would be (x: 0.4607325111036157, y: 0.9868553063575978)  
Moving to the target tag  
move_x: -0.7574997833622037, move_y: 2.457268364152192  
Landing!!!!
```

```
🍏 ~/Doc/hcc_final_competition 🐱 main !1 ?1 > |
```

```
🔊 26s 🍀 tello 🕒 19:14:49
```



# Venue introduction



## Given info:

Field size (Square map)

Known Apriltags' position \* 9 - 海报版

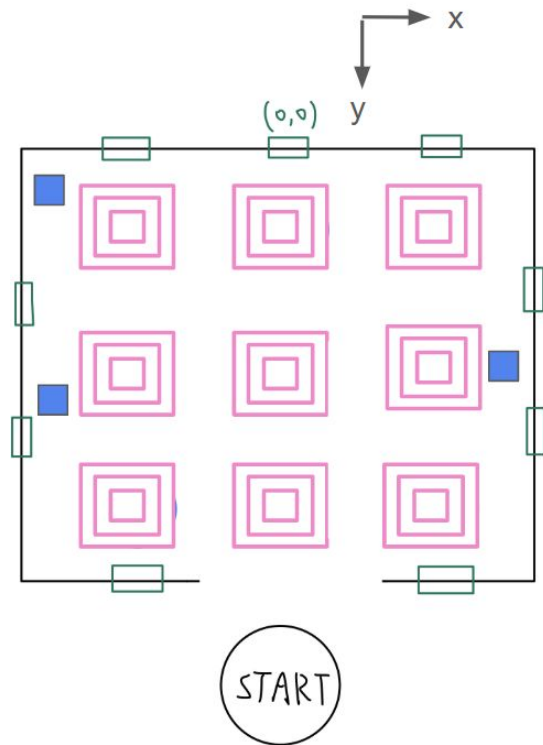
Unknown Apriltags' position \* 3 - 柱子

All landing spots' position \* 9 - 粉色板子

\*\*Match the objects in the image according to colors.

# Step

1. **Object Detection:** Before taking off, drone will identify the image. It should land in corresponding landing spot later.
2. **Detect Position:** There are 3 apriltags of unknown position in the field, estimate their position.
3. **Landing Accuracy:** Fly to the corresponding landing spot and land.
4. **Speed:** Finish all task as fast as possible.



# Before starting the competition

- Students will know the categories and can train first. Each category will have a set landing position, as shown in the table.
- Let the drone identify the landing position by recognizing the target object.

Categories	For example: Landing position (m, m)
hh_shuai	(1, 3)
lc_wang	(0, 2)
lw_ko	(0, 1)
cc_wang	(-1, 3)

# Details for Object Detection

- The goal is to recognize images of the professors from this course!!!

王傑智 教授



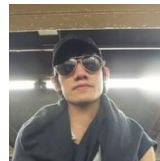
王蒞君 教授



柯立偉 教授



帥宏翰 教授



- We have provided a [training dataset](#); however, images used in the final competition **are not** included in this dataset.
- It is recommended that you print the color images, post them on a wall, and collect and label the data yourself.

# Score

## 1. Image Recognize: 20%

Recognize correct	20%
Recognize to one of the other items	10%
Recognize error	0%

## 2. Detect Position: 10% each by accuracy, 30% in total

the world coordinate of the target is (1.2003, 0.0075)

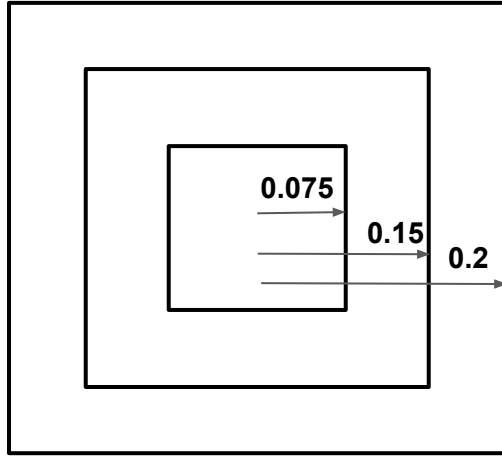
you guess the target is (x, y)

$$\text{distance} = [(x-1.2003)^2 + (y-0.0075)^2]^{1/2}$$

distance (m)	score
~0.15	10
0.15~0.25	8
0.25~0.45	6
0.45~0.55	4
0.55~0.7	2
0.7~	0

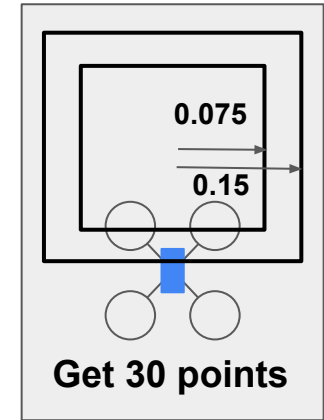
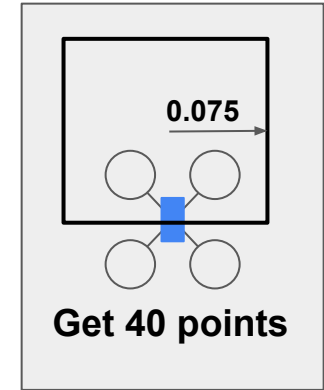
# Score

## 3. Landing Accuracy: 40% by accuracy



(m)	score
$\leq 0.075$	40
$\leq 0.15$	30
$\leq 0.2$	20
$> 0.2$	0

(based on the battery)



## 4. Speed: 10%, only counted if you score >0 points on all tasks



# Details of the Competition

1. At the start of the competition, each team will **draw four positions** from a 3×3 grid.
2. The three unknown AprilTag positions will be **randomly changed** during the competition.
3. The drone must move **without manual control**. The flight path is not restricted, and you can pre-program the drone's movement.
4. Recognition **can't depend on guessing** one of the four professor. (We will check your code !!!)