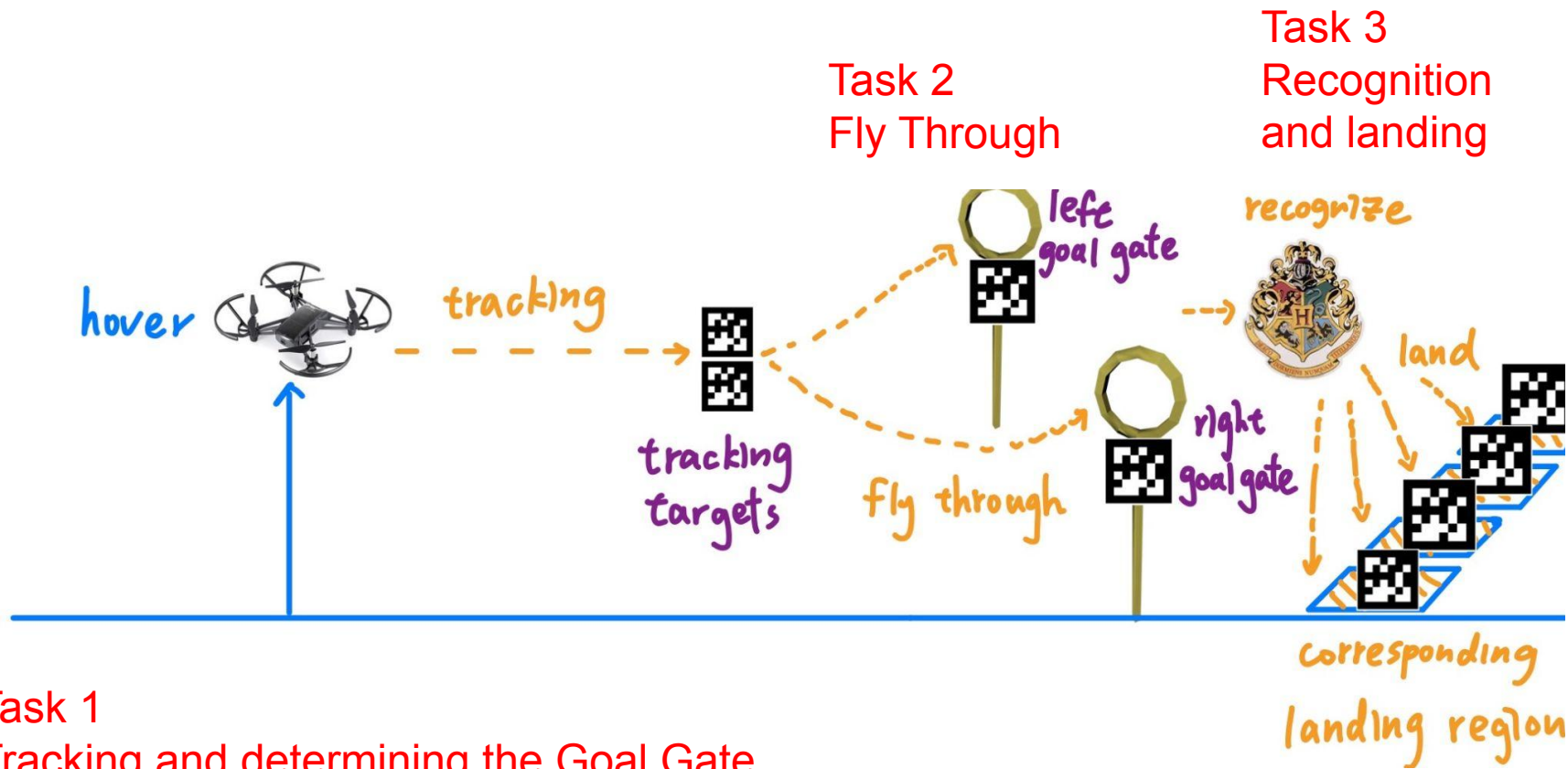


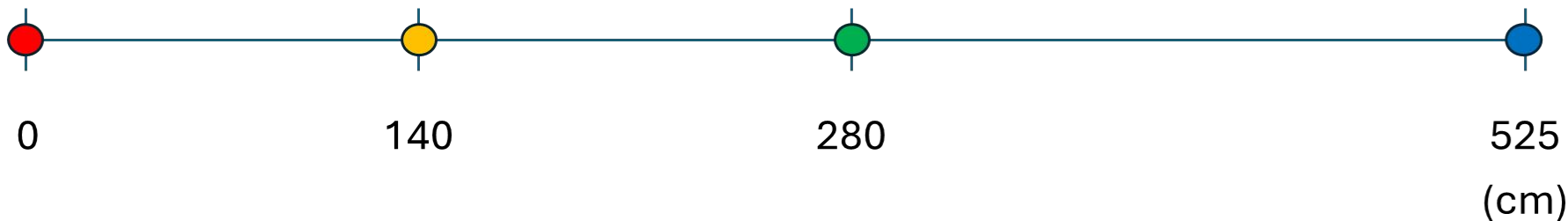
Quidditch Competition

2024 HCC Final Competition [[Video](#)]



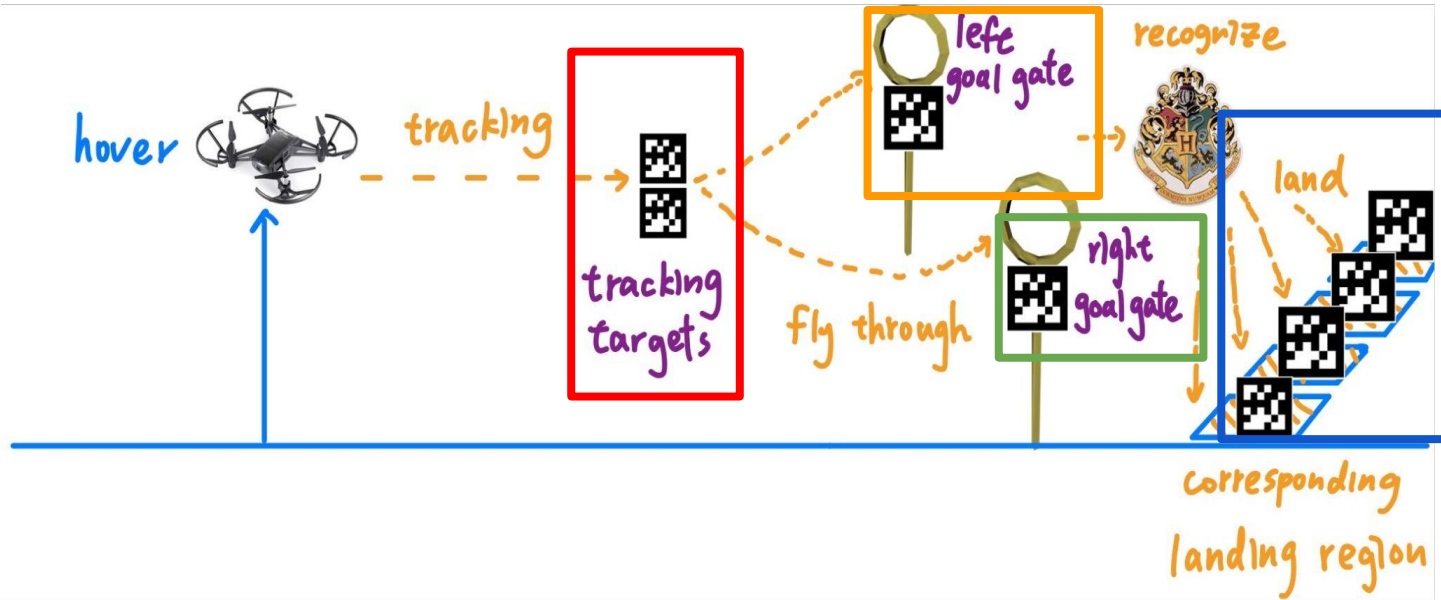
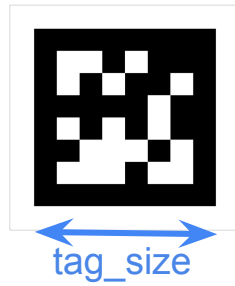
Route

1. **Starting Point** (Hovering)
2. **Tracking Targets** (Two apriltags)
3. **Goal Gates** (2 Gates, each with an apriltag)
4. **Recognition + Landing** (1 random image, with four apriltags / landing region)



Apriltags' Specs

- Size of all apriltag is about 10 cm.
- We will use the **tag36H11** apriltag IDs from 0~6.
- We will provide the apriltags to every team.



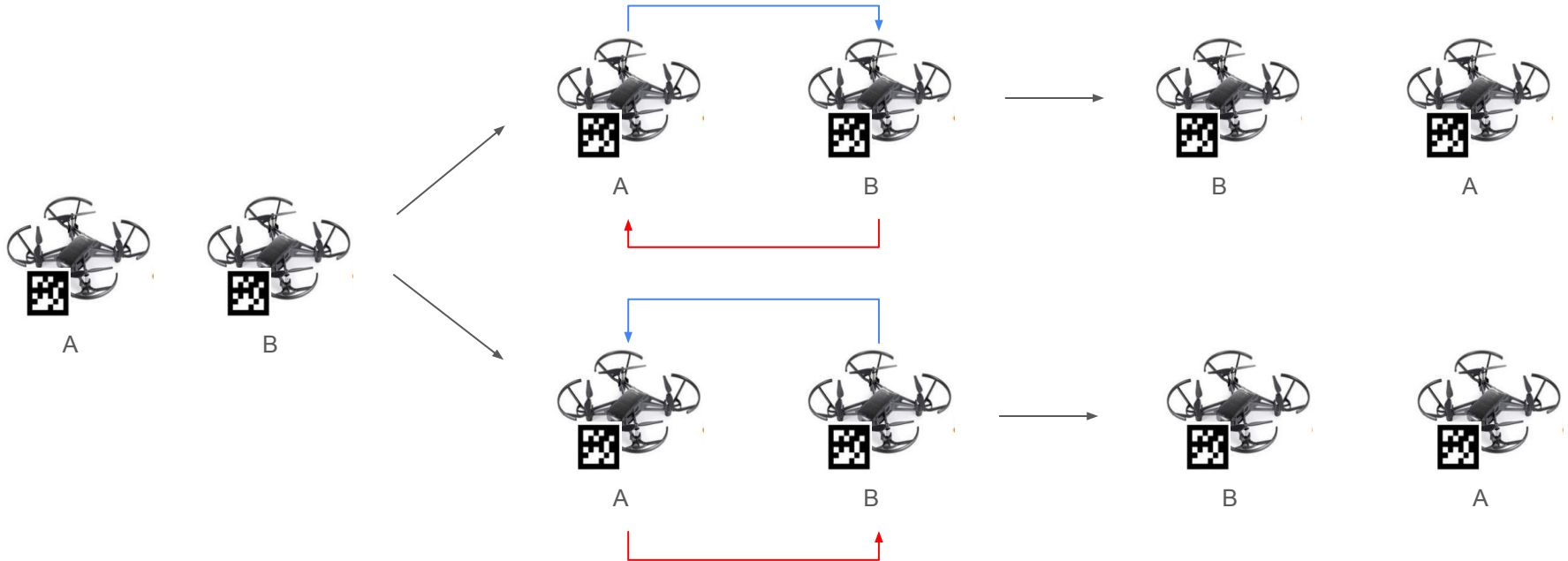
ID = 0 & 0
ID = 1
ID = 2
ID = 3~6

Task 1: Tracking and Determining the Goal Gate

1. Tracking with two apriltags with the same ID (ID: 0).
2. Two gates will be located in front of the hovering UAV.
3. Determining which gate to go based on the movement of the **two** apriltags. If the last one remaining in sight is
 - a. initially on the left, then select the left gate as the goal gate, or
 - b. initially on the right, then select the right gate as the goal gate.

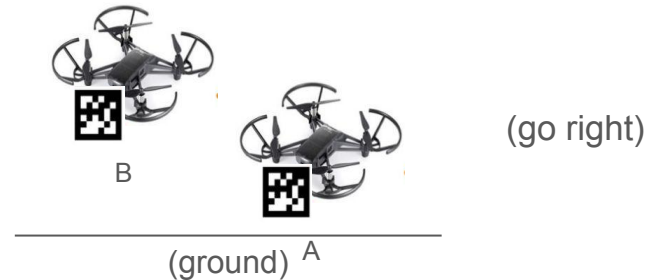
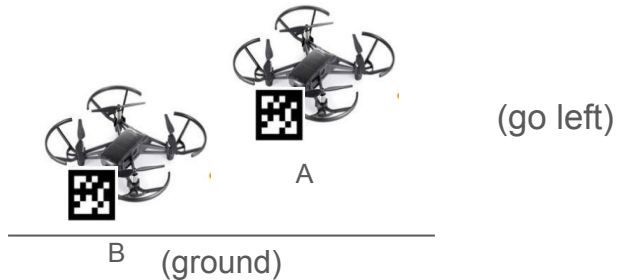
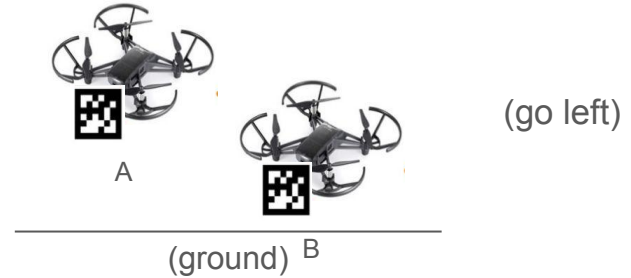
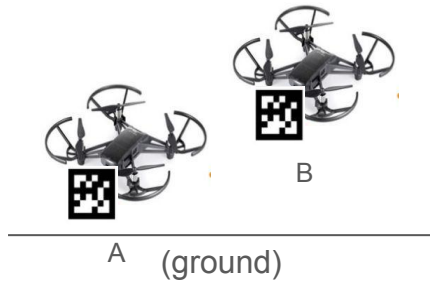
Task 1: Tracking and Determining the Goal Gate (Changing)

- **Drone A** will initially be on the left.
- Two drones will change their sides about 2~4 times (randomly).



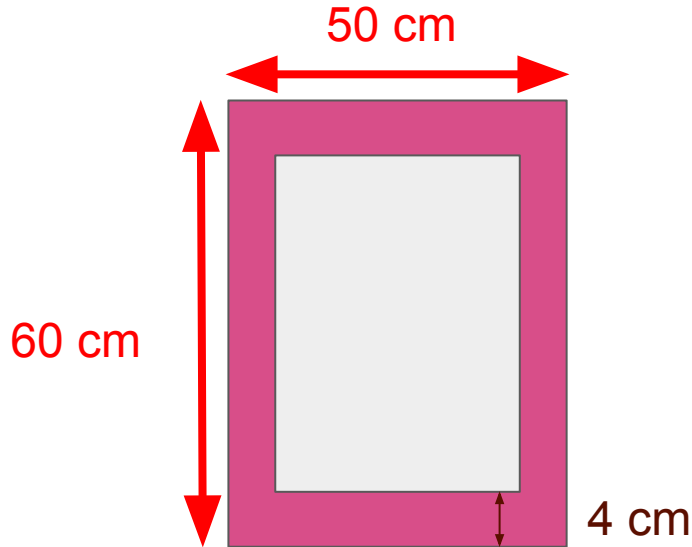
Task 1: Tracking and Determining the Goal Gate (Landing)

1. If **drone A** is still flying, pass through the left gate.
2. If **drone B** is still flying, pass through the right gate.



Task 2: Flying Through the Goal Gate

1. Each goal gate will be labeled with a unique apriltag ID (ID 1 and 2) on its bottom side.
2. Navigate the drone through the goal gate.



Task 3: Recognition and Landing

1. After flying through the goal gate, an image of a Hogwarts House will appear in front, and YOLO (we recommend) will be used for object detection.
2. Based on the recognition results, each team should make the drone land in a square area (**45 cm x 45 cm**) in front of the targeted apriltag.
3. Please check the next page for the corresponding tag ID to each house image.

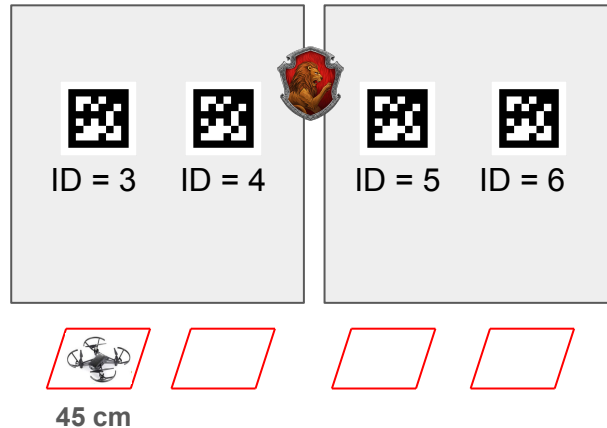


Image of each Hogwarts House

Gryffindor	Hufflepuff	Slytherin	Ravenclaw
			
ID = 3	ID = 4	ID = 5	ID = 6

Demonstration Video



Grading

1. Show the correct goal gate with tracking. (30%)
2. Flying through the goal gate. (30%)
3. Successful recognition (20%) and landing in the designated area. (10%)
4. Ranking based on the finishing time (10%)
 - (Only those teams getting the first 90% will be ranked)

Rules

- You **CANNOT** control the drone manually except for emergency. If we catch any cheating behavior and no surrender is made, you will get zero score in the final competition.
- Every group can try your best in **10 minutes** !
- To successfully fly through the goal gate, crashing must be avoided.
- As long as **any part of the UAV's body touches the line** landing in the designated area, it is considered **successful**.

Required Abilities

At least you should know:

- UAV flight control
- Object Detection
- Localization
- Tracking

Tips

1. Please setup a keyboard that can immediately turn off the drone to prevent danger.
2. When performing tracking, please set a counter before deciding the tag ID to prevent wrong tracking result due to the loss of frame.
3. [YOLOv10](#) is out! Maybe give it a try!