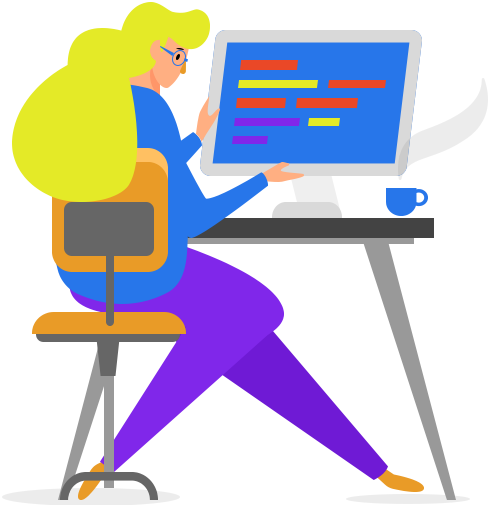# Day 4
Preparation for Competition

Speakers:
ZHOU Siyu (Zoe)
ZHONG Licheng (Simon)
DENG Chunwei (Logan)

What Will We Do Today?

1 Competition Rules

2 Measuring Data and Selecting Flying Route

3 On-site Investigation

4 Calculating Data and Planning Flying Route

5 Preparation of PPT

6 Practicing Preparation

Competition Rules

Schedules

Onsite Investigation Schedule (Today – Day 4):

Class 1 – 9:30-10:00 (SAST)/ 15:30-16:00 (HKT)
Class 2 –12:15-12:45 (SAST)/ 18:15-18:45 (HKT)

Rundown Schedule (Tomorrow – Day 5):

for Class 1	for Class 2
9:25 – 10:00	12:10 – 12:45
10:00 – 10:35	12:45 – 13:20

Part I
A.I. National Park Service Ranger
25 mins per team
(15 mins preparation
+ 10 mins flying & adjustment)

Part II
Future Developer
for A.I.
Team Presentation
(3-5 mins / team)

Competition Rules

On Competition Day	
Teams take turn to carry out the 25 mins preparation and flying at the competition area	
15 mins preparation	1. Final check on the Huskylens' data, measurement and program 2. Revise measured data in the program/ re-take the photos (if any) 3. Upload the program to your drone 4. Charge your drone and the spare batteries 5. Submit the flying route to judge 6. No trial in the competition area is allowed!
10 mins flying time (& adjustment)	1. Place the programmed drone at any ONE of the "Start" points and activate the drone 2. Timekeeper starts timer 1 for 10 mins once the drone is activated 3. Judge starts timer 2 to record the time for each attempt and follows the drone to do the marking (please refer to Appendix I) 4. During the flight, the following 3 conditions MUST be met for a successful recognition:

Competition Rules

(1) the object is being recognized at a reasonable distance (<50cm),

(2) the correct naming *(see Appendix I for the naming)* of the object ID displayed in the Huskylens, and

Competition Rules

(3) LED light is flashed correctly for each object *(see Appendix I for color scheme, (with updates))*

5. During the flight, judge has the final right to stop the drone manually if there is any foreseeable risk. The drone must be placed on the "Start" marker again for next attempt

6. In between each flying attempt, adjustments (e.g. flying distance and angles) can be made to the program

Scoring Guidelines

The final score is used to determine the Champion, 1st runner-up and 2nd runner-up of each participating unit *(see Section 2)*. It is calculated based on your performance in Part I: A.I. National Park Service Ranger and Part II: Future Developer for A.I. Application *(please see Appendix I for detailed score breakdown)*. The best score out of maximum 3 attempts in Part I is used for final marks calculation. If multiple teams score the same, the rank is determined following these priorities: (1) the one who complete Part I with fewer attempts wins; (2) the one who complete Part I using less time wins.

Upon completion of all competitions, the final scores are also used to compare results with teams from other participating units to determine winners for **Inter-School Category**.

Winners can receive a certificate of achievement to recognize their excellent performance.

Part I: A.I. National Park Service Ranger (220 marks in total)

Mark awarded

Marks are awarded to each object that can be successfully recognized under following 3 conditions:

(1) the object is being recognized at a reasonable distance (<50cm),
(2) the name of the object ID displayed in the Huskylens, and
(3) LED light is flashed correctly for each object *(please refer to Appendix I for color scheme)*

Scoring Guidelines

Mark deduction

- If your drone causes any damage to the objects in the competition area, 5 marks will be deducted for each damage.
- If your drone flies beyond the competition area, 10 marks will be deducted.
- If your drone does not fly in a diagonal line, 50 marks will be deducted.

FAQs

1. **If my drone is out of battery in between and fails to complete the whole route, will my team use up 1 attempt?**
   No, there will be spare batteries available from the judges.

2. **If my drone crashes and falls, or being stopped by judges due to foreseeable risk, will my team use up 1 attempt?**
   Yes, so please make sure you double check your program and handle your drone with care.

3. **If my drone stops during the attempt, will the marks still be counted?**
   Yes, only objects recognized when the drone is flying will be counted towards the score.

4. **If my drone stops during the attempt, will the 10-min flying time be reset?**
   No, it will count into the 10-min flying time of your team. Hence, please make good use of the time and plan wisely.

Scoring Guidelines

| Item	Color Scheme	At a reasonable distance (<50cm)	LEDs	Display name on Huskylens	Score
E.g. Object 1	RGB (0,255,0)	*Y*	*N*	*Y*	*0* /25
E.g. Object 2	RGB (255,255,0)	*Y*	*Y*	*Y*	*25* /25
ATTEMPT 1					
Zebra	RGB (0,255,0)				/25
Tiger	RGB (255,255,0)				/25
Elephant	RGB (204,51,204)				/25
Panda	RGB (0,0,255)				/25
Hunter 1	RGB (0,255,255)				/30
Hunter 2 (with duck)	RGB (255,204,0)				/30
Visitor 1 (girl)	RGB (0,255,0)				/30
Visitor 2 (boy)	RGB (255,204,255)				/30
Time spent:			Mark deduction ^{see remark:}		
				Sub-total:	/220
ATTEMPT 2					
Zebra	RGB (0,255,0)				/25
Tiger	RGB (255,255,0)				/25
Elephant	RGB (204,51,204)				/25
Panda	RGB (0,0,255)				/25
Hunter 1	RGB (0,255,255)				/30
Hunter 2 (with duck)	RGB (255,204,0)				/30
Visitor 1 (girl)	RGB (0,255,0)				/30
Visitor 2 (boy)	RGB (255,204,255)				/30
Time spent:			Mark deduction ^{see remark:}		
				Sub-total:	/220
ATTEMPT 3					
Zebra	RGB (0,255,0)				/25
Tiger	RGB (255,255,0)				/25
Elephant	RGB (204,51,204)				/25
Panda	RGB (0,0,255)				/25
Hunter 1	RGB (0,255,255)				/30
Hunter 2 (with duck)	RGB (255,204,0)				/30
Visitor 1 (girl)	RGB (0,255,0)				/30
Visitor 2 (boy)	RGB (255,204,255)				/30
Time spent:			Mark deduction ^{see remark:}		
				Sub-total:	/220

# Measuring Data and Selecting Flying Route

Flying Route and Data Needed to Measure

The dimension of each national park is around 3m (L) x 3m (W) x 2m (H), in which 8 objects are scattered around. There are THREE "Start" points that you can choose from for the drone to take off. For details, please refer to the diagrams below, however please note that the diagram is not drawn in exact scale. Fields are slightly varied in size, but teams will be assigned to the same field for both on-site investigation and competition, so the variation will not affect you.

Top view	Side view

Key : pictures to be recognised
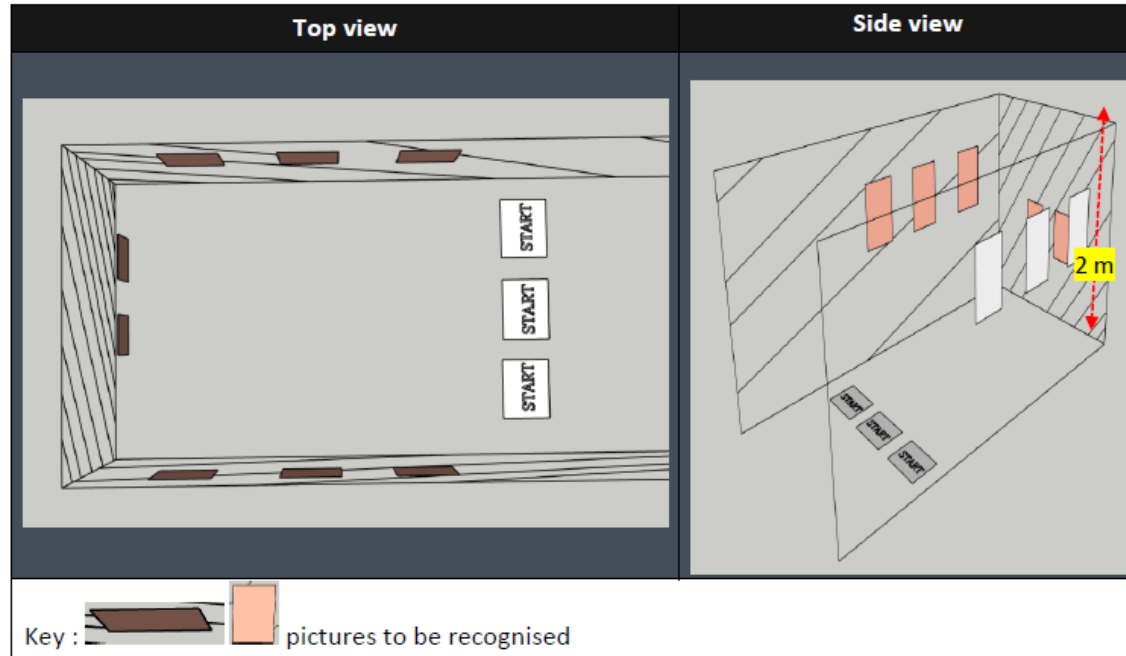
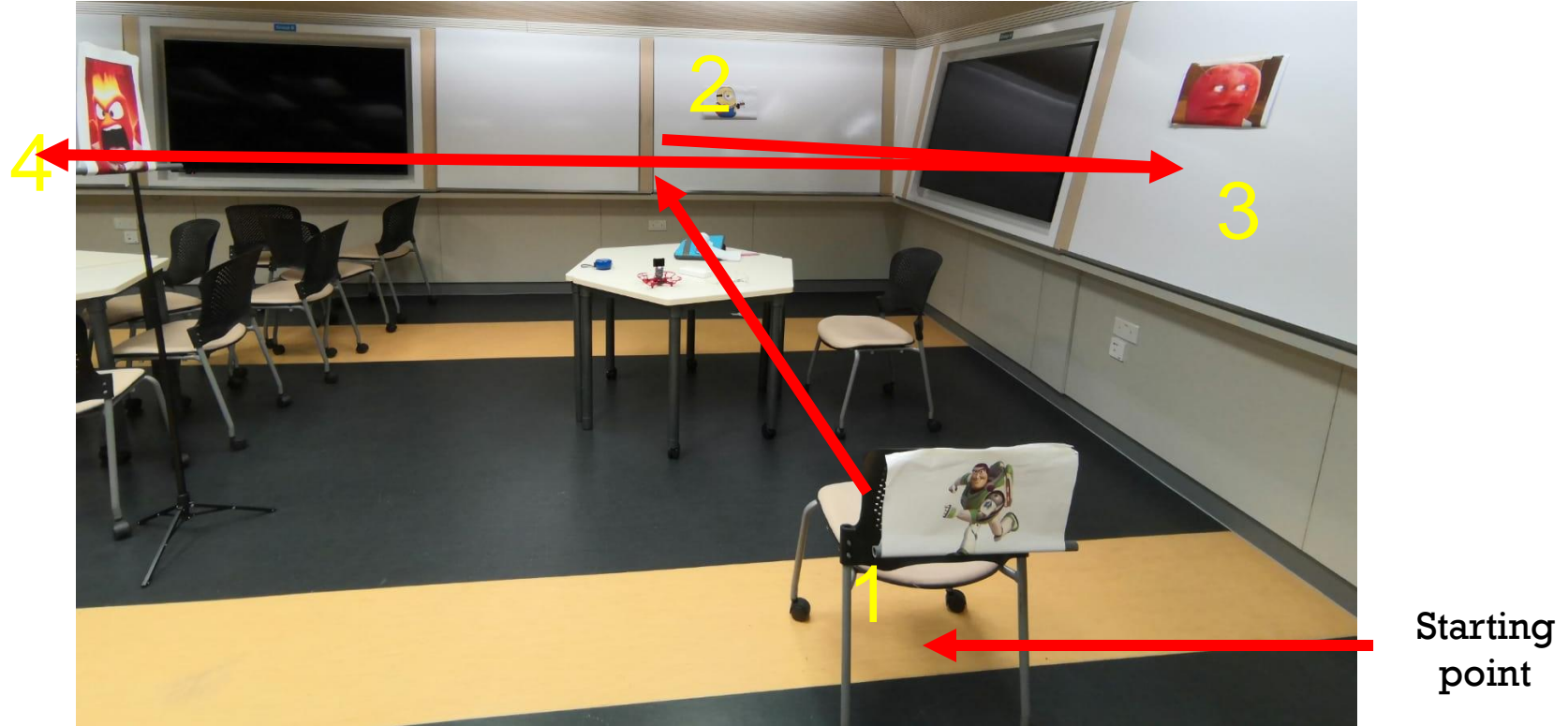# Flying Route and Data Needed to Measure
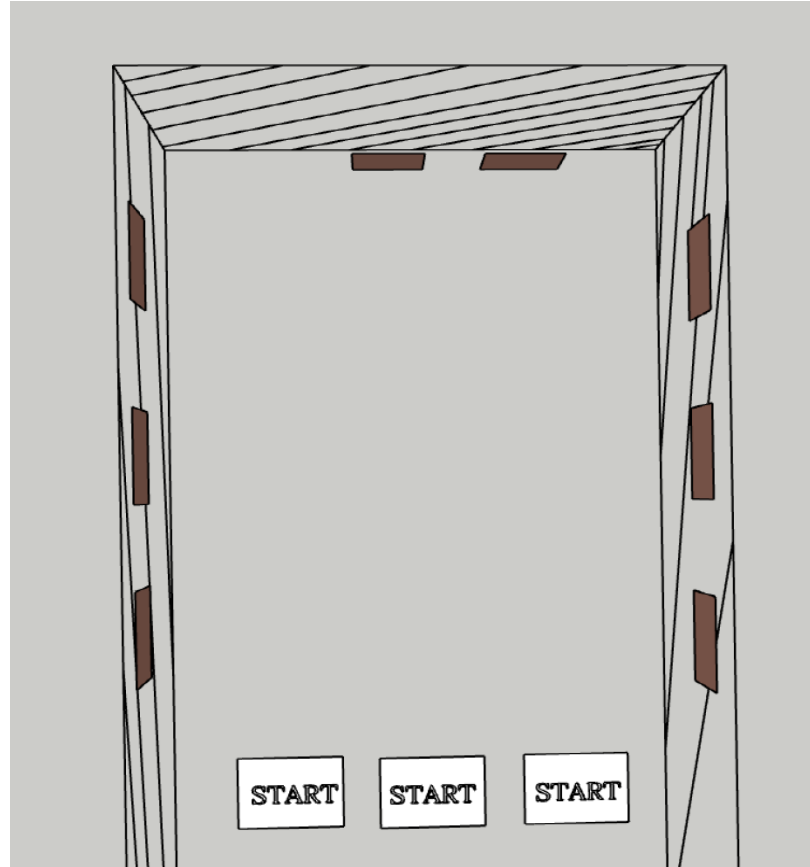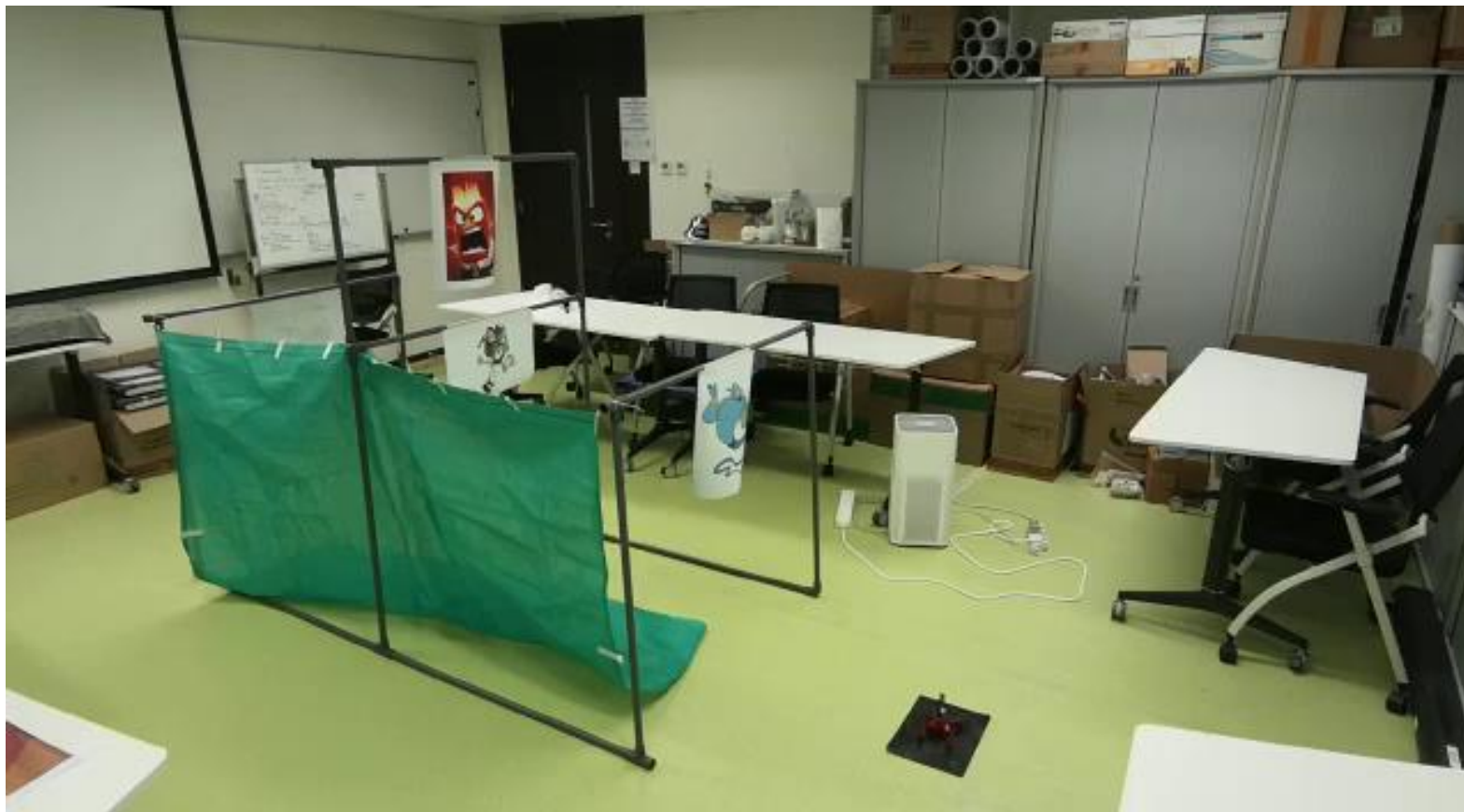
Flying Route and Data Needed to Measure

Starting point

Flying Route and Data Needed to Measure

Expected Outcome

Points to Note

(1) Suggested to minus 30 cm when you program the drone to fly forward
to avoid drone crash (possible error due to drone setting)
e.g., flying route: 110 cm → fly forward 80 cm

(2) Optimal scanning distance from the object: 40 - 50 cm (in this
workshop, we choose 50 cm)
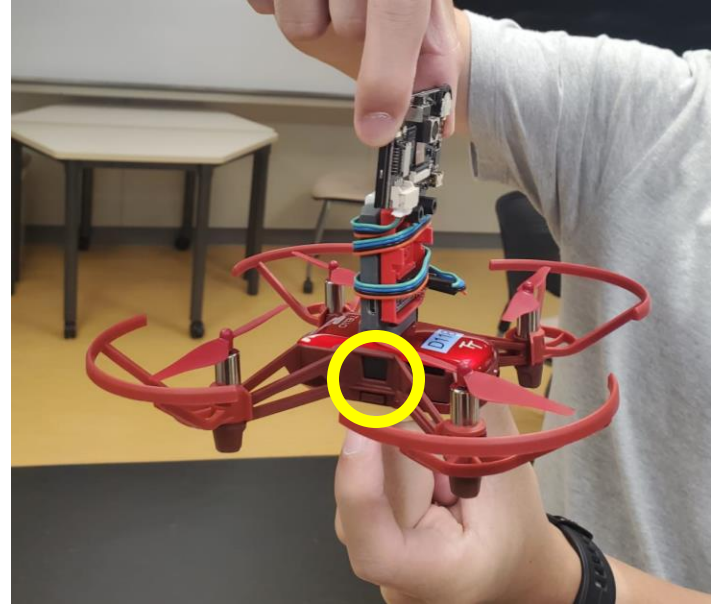e.g., distance between A and B: 160 cm → fly forward 80 cm

(3) Default take-off flying height: 80 cm (Be aware that the lens is located
10 cm above the drone)

How to Stop Huskylens?
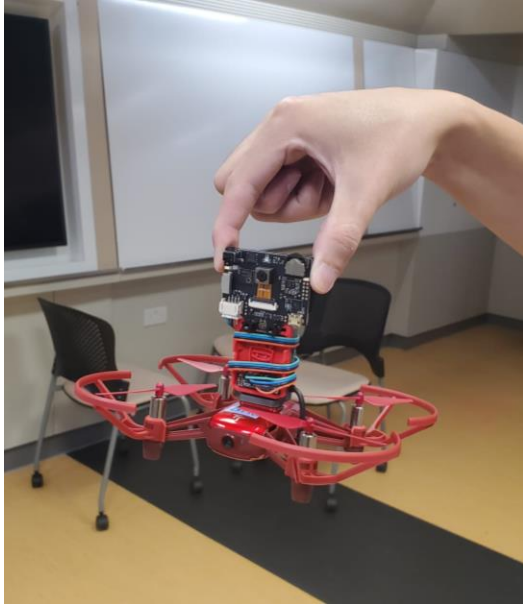
1. Hold the drone like this.

2. Press the power button of the drone.

Demo Videos

Demo Video 1

Demo Video 2
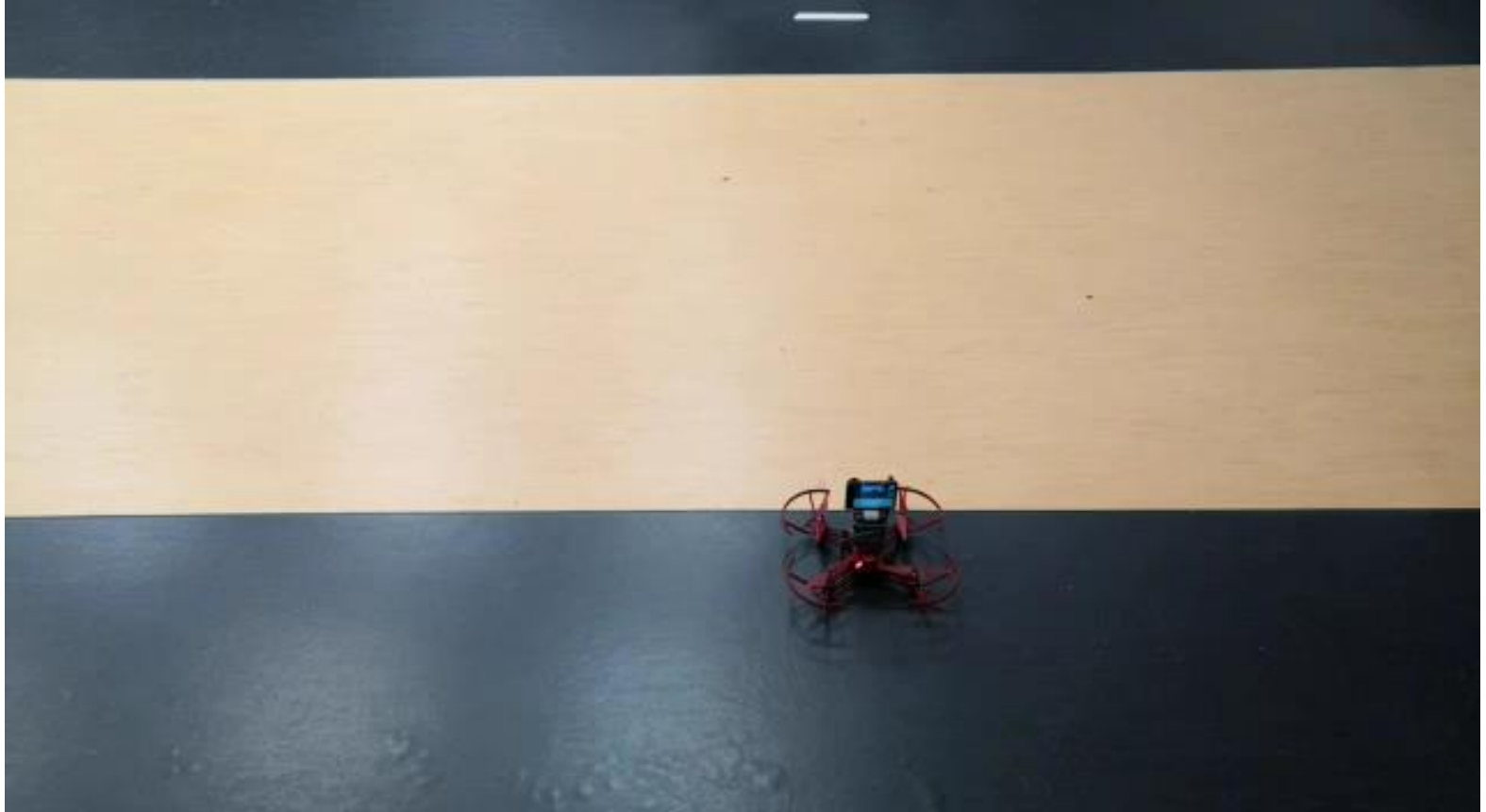
Demo Video 3

Optional Exercise

Exercise

B   2m   **A**

3m

2m

θ_1

θ_2

C   2m   **D**
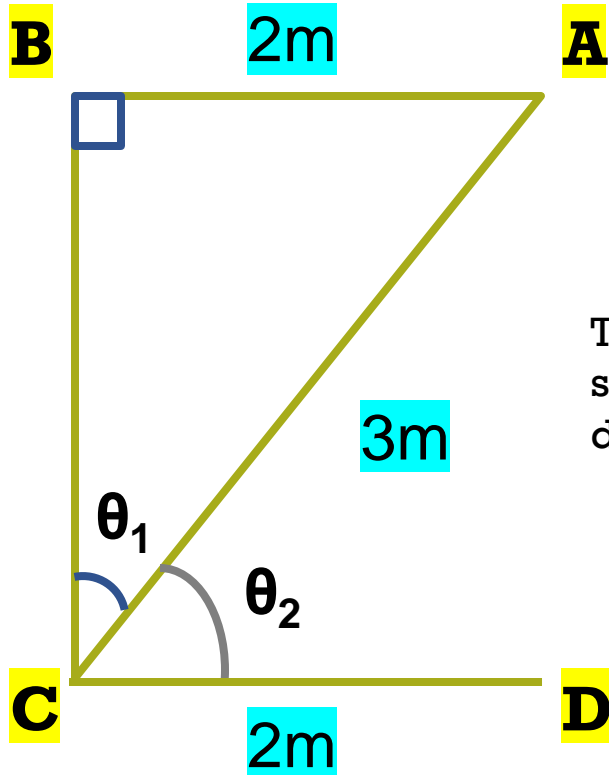
The drone starts from this direction.

(1) If the drone flies from point A to point B, ~~what are the rotational directions with angles of flying~~?

What are the translational directions and distances?

forward 2 m

Exercise

B   2m   A

3m

The drone is now facing at direction.

θ₁

θ₂

C   2m   D

(2) If the drone flies from point B to point C, what are the rotational directions with angles of flying?

counterclockwise 90°

What are the translational directions and distances?

forward $\sqrt{5} \approx 2.236$ m

Exercise

B   2m   A

θ_1

3m

θ_2
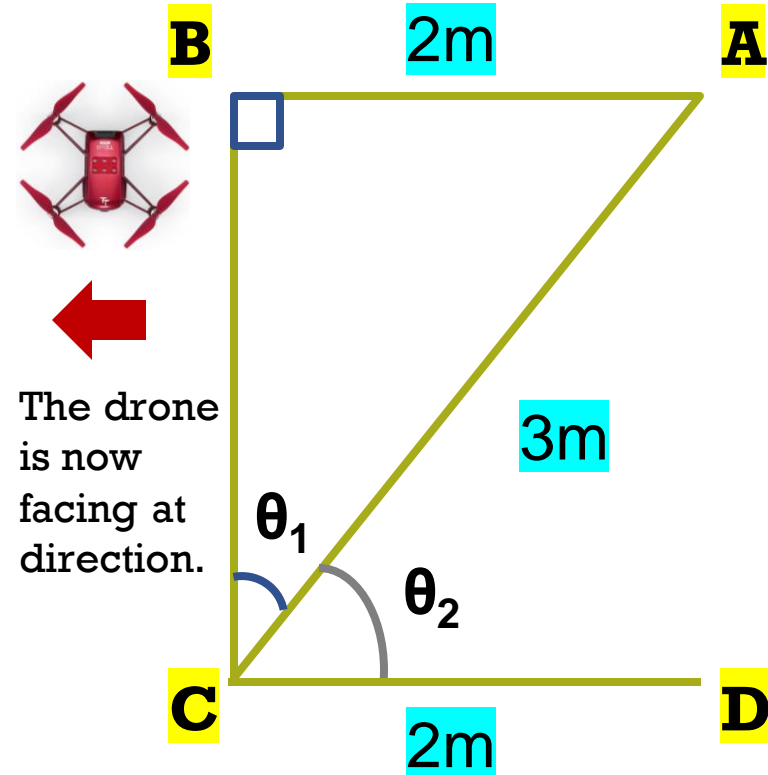
C   2m   D

The drone is now facing at direction.

(3) If the drone flies from point C to point D, what are the rotational directions with angles of flying?

counterclockwise 90°

What are the translational directions and distances?

forward 2 m

Exercise

B   2m   A

3m

θ_1

θ_2
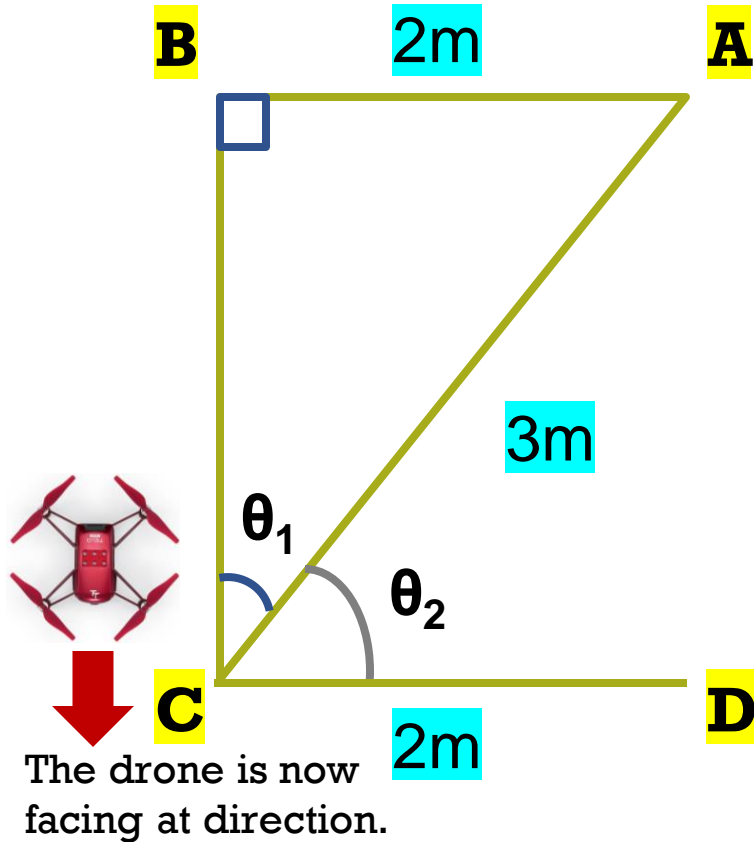
C

2m

D

The drone is now facing at direction.

(4) If the drone flies from point D to point C, what are the rotational directions with angles of flying?

(counter)clockwise 180°

What are the translational directions and distances?

forward 2 m

Exercise

B   2m   A

θ_1

3m

θ_2

C   2m   D

The drone is now
facing at direction.
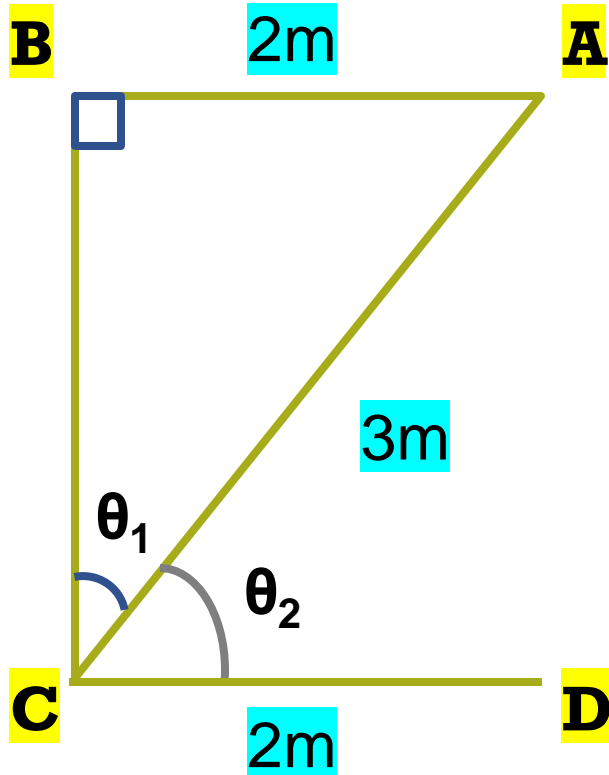
(5) If the drone flies from point C to point A, what are the rotational directions with angles of flying?

clockwise 131.81°

What are the translational directions and distances?

forward 3 m

Exercise

B **2m** A

The drone is now
facing at direction.

3m

θ_1

θ_2

C **2m** D

(6) If the drone flies from point A to point B, what are the rotational directions with angles of flying?
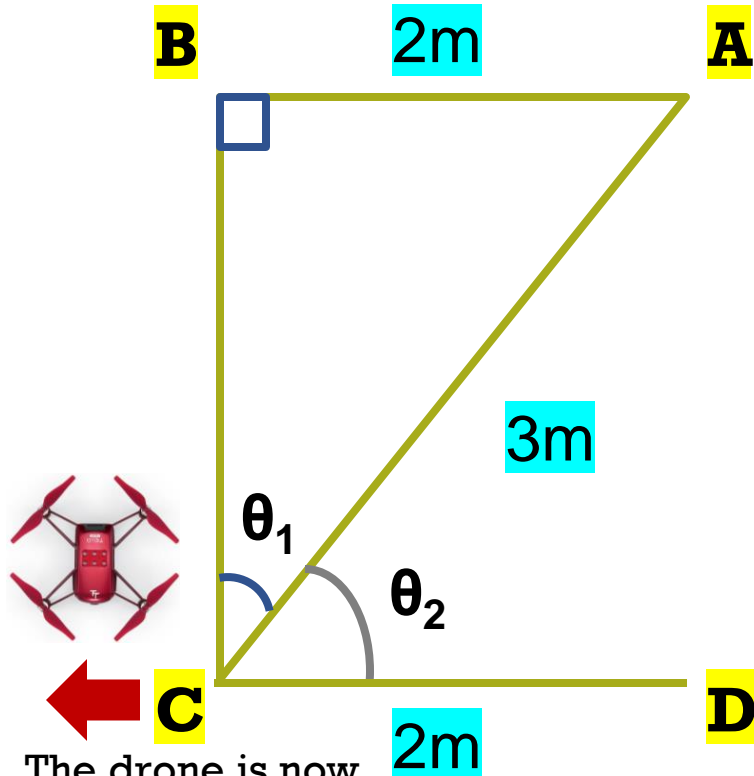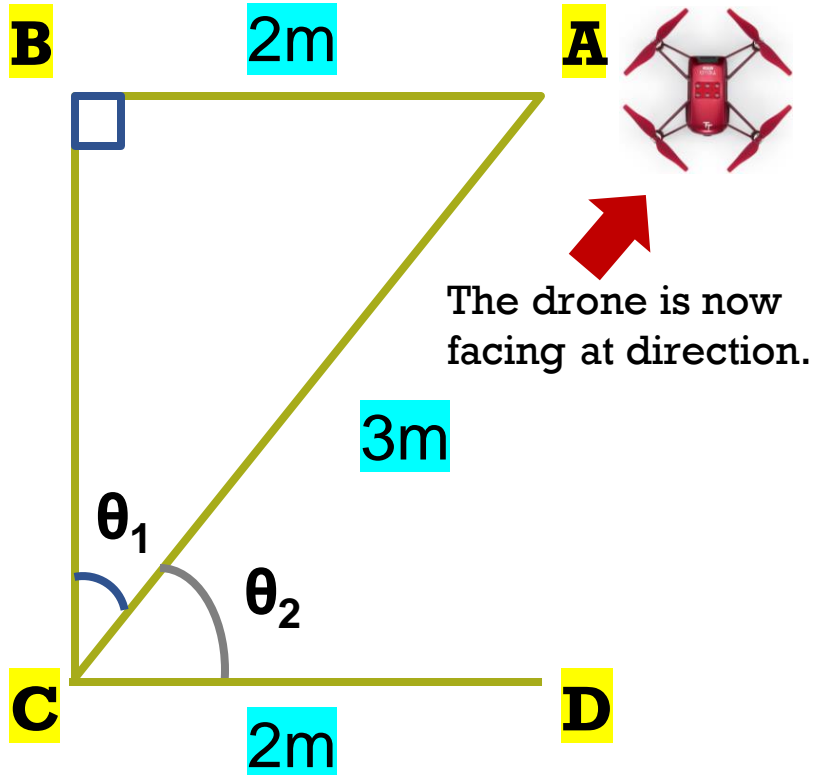
counterclockwise 131.81°
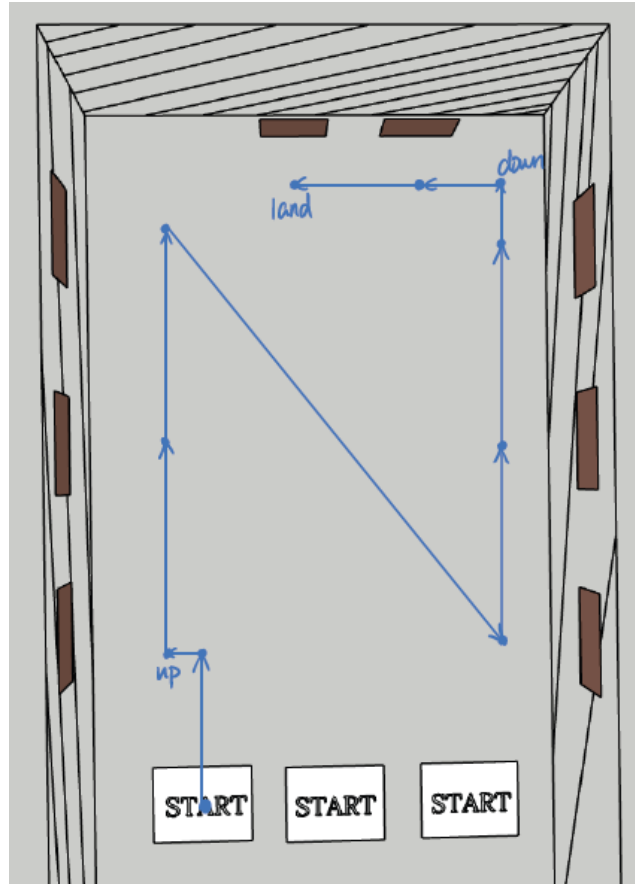
What are the translational directions and distances?

forward 2 m

Calculating Data and Planning Flying Route

Flying Route

On-site Investigation

Designing, Programing, and Uploading

Preparation for Presentation

Presentation Information

Key words: "A.I. for social goods"

Link: https://www.microsoft.com/en-us/ai/ai-for-good

Time (recommended): 4-5 minutes

PPT (recommended): 4-5 slides

Structure (recommended): what-how-why

Cover (1): Title, picture, presenter names, (and any other words if needed).

What (1): What is it? What is its connection with object recognition and drone?

How (1-2): How does it work? How can it be applied for social goods?

Why (1): Why does it make a positive impact to the community?

Presentation Information

Presentation Criteria:

(1) Originality and Creativity

(2) Adherence to the theme

(3) Presentation Clarity

Criteria	Description	Marks
(1) Originality and Creativity	Show imagination and originality, able to give audience surprises	30
(2) Adherence to the Theme	Highly correlates to the theme "A.I. for social good" and demonstrate impact to the community	30
(3) Presentation Clarity	Well-structured, speaks confidently, materials are clear with good use of visual aids	20

Optional Resource

Link: https://www.youtube.com/watch?v=MnIPpUiTcRc

Thank you for listening!