YOLOv5 + DJI Tello Integration Guide

Step-by-Step Setup for Real-Time Object Detection

1. Introduction
This guide walks you through connecting the DJI Tello drone with YOLOv5 for real-time object detection using Pyth

2. Requirements
- DJI Tello drone
- A PC or laptop with Wi-Fi (connected to Tello)
- Python 3.7+
- Required Libraries:
  • djitellopy (for Tello control)
  • OpenCV (for video frame capture)
  • torch and torchvision (for running YOLOv5)

3. Step-by-Step Setup
Step 1: Connect your PC to the Tello drone's Wi-Fi network.

Step 2: Install the required Python packages:
```
pip install djitellopy opencv-python torch torchvision
```

Step 3: Import necessary modules in Python:
```
from djitellopy import Tello
import cv2
import torch
```

Step 4: Load the YOLOv5 model:
```
model = torch.hub.load('ultralytics/yolov5', 'yolov5s', pretrained=True)
model.conf = 0.5
```

Step 5: Connect to the Tello and start video stream:
```
tello = Tello()
tello.connect()
tello.streamon()
frame_read = tello.get_frame_read()
```

Step 6: Process video frames with YOLOv5:
```
while True:
    frame = frame_read.frame
    results = model(frame)
    results.render()
    cv2.imshow('Tello YOLOv5', results.ims[0])
```

Step 7: Clean up after stopping:
```
tello.streamoff()
tello.end()
cv2.destroyAllWindows()
```

4. Notes:
- Use 'q' key to quit the OpenCV window.
- Make sure to run the script while connected to Tello's Wi-Fi.
- Do not run multiple Tello clients simultaneously.

5. Next Steps:
- Add tracking to follow specific objects.
- Save frames with detection for analysis.
- Stream data to a dashboard or app.