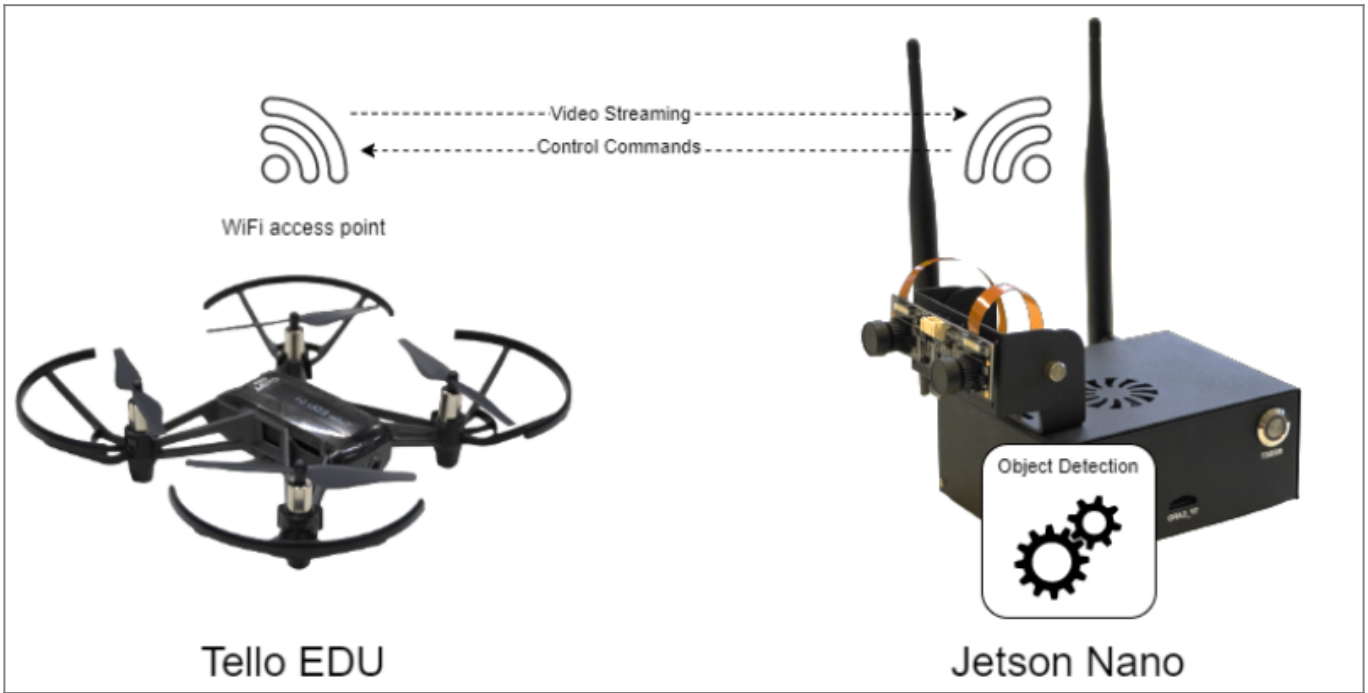
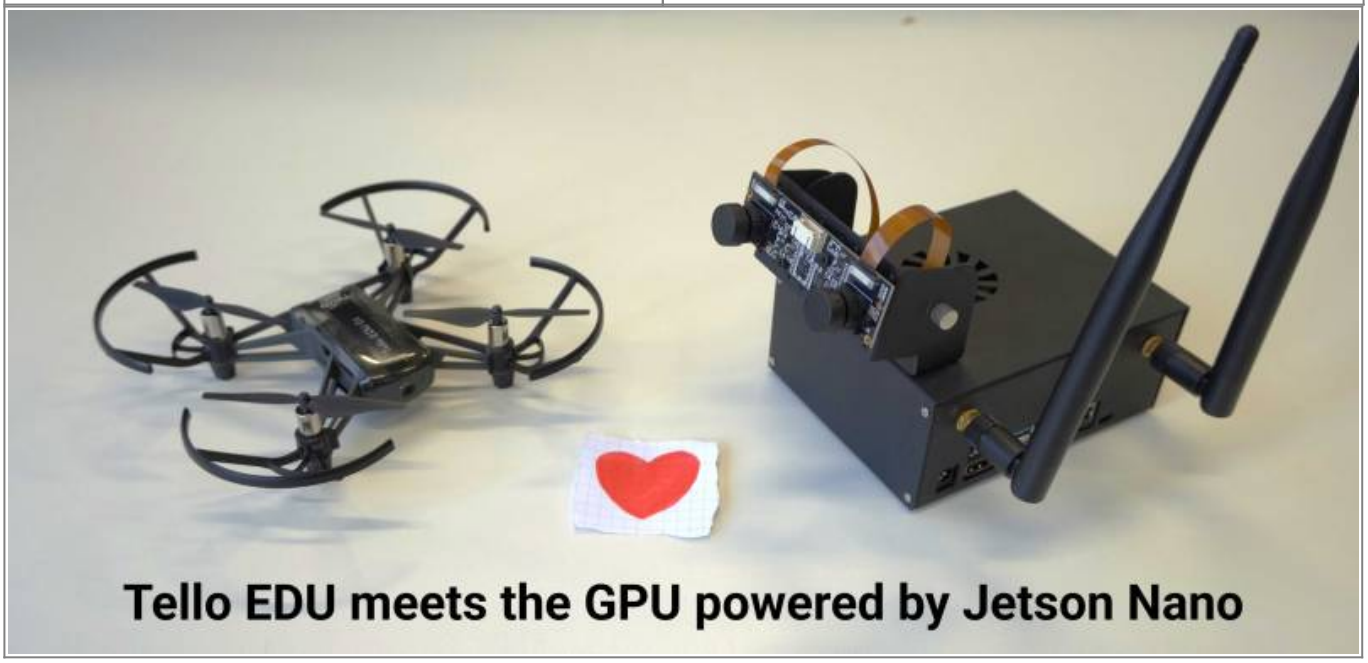
Object Detection with Mini Drones



initial_test_tello_jetson.mp4	person-tracking-demo01.mp4
Object Detection - Demo Video	Person tracking - Demo Video



Description

The Tello drone changes own angle to keep the detected person close to the center of camera viewpoint. If there are more than one person, the one is chosen, which is closer to the camera. The calculation of the closest person is done through detection area comparison in order to select the detection with the biggest area.

Used libraries

In order to control and detect objects a several Python libraries were used. To control the drone, the Tello library [1] was imported and applied to send basic movement and streaming commands. The object detection was implemented by using standard jetson.inference [2] module. The output of camera and key controls was implemented via OpenCV library [3].

PID Controller

To make the process of changing yaw angle smoother, the PID Controller mechanism was implemented in Python. The values of P and D were adjusted during experiment for the given image parameters. More about it you can read here https://en.wikipedia.org/wiki/PID_controller

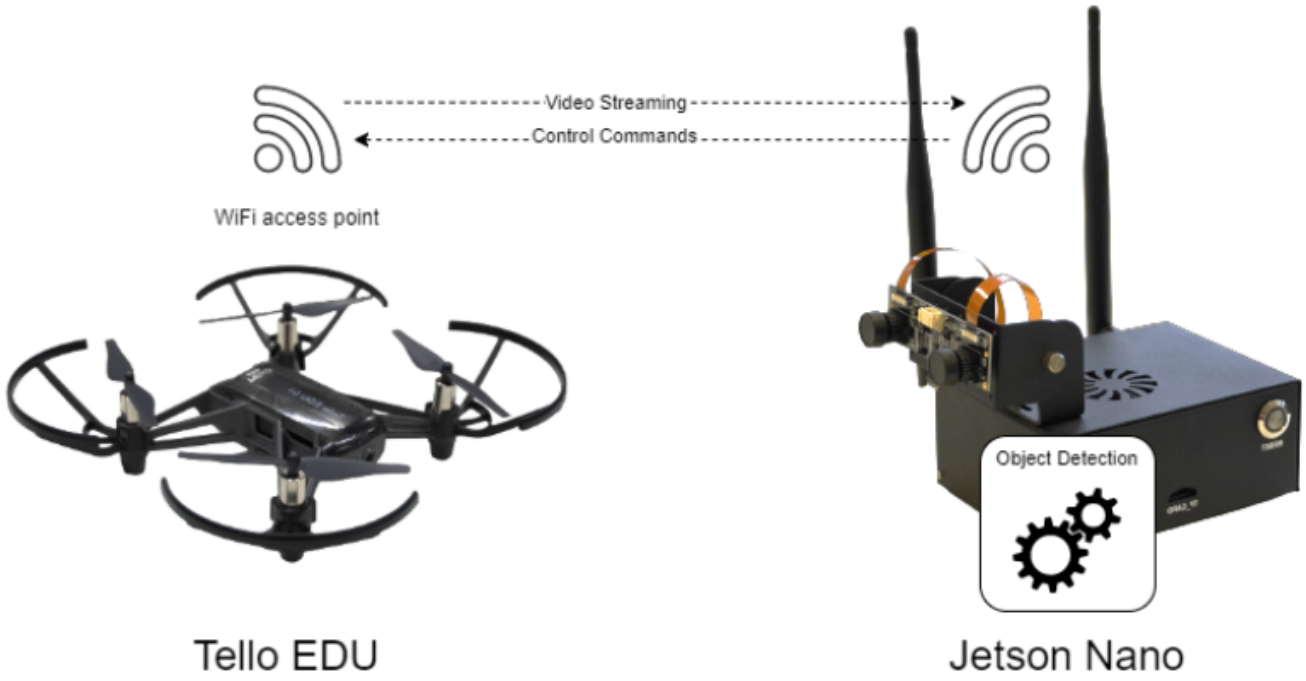
The motivation for this experiment were the numerous public papers and Youtube videos. Particularly, the videos of Murtaza (https://youtube.com/playlist?list=PLMoSUbG1Q_r8ib2U4AbC_mPTsa-u9HoP_) were used as for PID implementation.

The code is published for open access on GitHub under the link: https://github.com/eligosoftware/ryzetellohsrw. The main python file is https://github.com/eligosoftware/ryzetellohsrw/blob/main/move_head.py

External links

1. Tello library GitHub https://github.com/harleylara/tello-python
2. Jetson Inference GitHub https://github.com/dusty-nv/jetson-inference
3. OpenCV https://opencv.org/

Communication Overview



More on Mini-Drones and Object Detection

- ESP32-CAM Video Streaming and Face Recognition with Arduino IDE
- Building an ESP32-CAM based recon drone from Rainbow Six Siege

ESP related projects

- ESP-Drone, official project by ESPRESSIF
- Meet ESPcopter, main website
- ESPcopter store

Mini Drones

Video	Video
1. Educational Drone 1, Parrot Mambo (discontinued)	**2. Educational Drone 2**, Ryze Tello EDU