Tello droning report

Eskola Aleksi
Hautamäki Kalle
Lähdesniemi Helena
Vahala Patrik

Github link: https://github.com/Pjavah/RAS_Project_1
After a slow start from first drawing the orange rectangle and configuring tello in general, Aleksi got the aruco marker detection working where we continued with the tello direction commands. First the arucomarkers.py was made where the code was transferred into a function markAruco, which was then used in the camsub_qr.py file.

Shortly the code for camsub_qr.py goes like this: create necessary publishers and subscribers, fetch the image from tello and convert it into a cv2 compatible image (imgmsg_to_cv2). Then we jump into the markAruco function, which finds the qr markers, their center points, the center of the center points of qr markers, center of image, and the distance and direction from center of qr markers to center of image. The function returns frame (image), position (direction from the center of qr to center of image), and qr_distance (relative size of qr markers compared to the image).

First the drone gets the command to go up since it usually takes off to a too low of a height. Then depending on what the camera sees of the qr markers gets direction to aim for the center. The code aims a little bit lower than the actual middle because the drone likes to lean forward. When the drone gets close enough, it gets the command to fly straight forward a couple of seconds, and lands after that.

After this we got back to working on the now green gates (camsub_color.py). The code is pretty much the same: go up 12 seconds this time, find the gate position and line it up, go close enough, go through and land. This one uses the function countourSquares from gettingcontours.py, which searches the image for a certain green color, makes it into a rectangle, and exports similar information to markAruco. This time the relative size is compared from the width of the rectangle to the image width.

After completing these two gates, we combined the knowledge and made loop_de_loops.py code which first goes through the aruco marked gate and after that start spinning left and rising a little bit and searching for the coloured gate. After spotting and inclining, it goes through and lands.

cornercontours.py and camsub_corner.py have the code which guides the drone through the gate that only has its corners marked with green. It worked as we had hoped since it really is just a little re-skin of the previous codes. Only difference being that it calculates the center of the gate based on the centers of the bounding boxes it creates on the corners. Due to the time limits we weren’t able to combine this with the others and thus it will remain as its own implementation.