Drone project IE303812

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PROJECT

Our idea is to use a drone to find and go through rings. There will be two modes, manual and auto. Manual mode will be used to stop the drone from destroying the school's property and guiding it to the area where the rings are set up. We will be using a PS3 controller for the manual mode. In auto mode the drone should automatically detect and determine how to move to get through the rings.

During both modes we will be using a graphical user interface (GUI) where the video feed will be shown, including relevant information gathered from the drone (i.e. height, heading etc). Swapping between manual and autonomous modes will be implemented in the GUI.

The rings will be hula-hoops painted in a single color. A solid colored ring will ease the image processing task, compared to a ring with an arbitrary pattern.

In autonomous mode, the drone will communicate via Wi-Fi with a computer, the drone will send the real-time video and other information to the computer. The computer will then process the image and try to detect the hula-hoops. From this data, we will find a way to move the drone directly in front of the ring and move it through the ring.

For this project we will be using the AR-Drone 2.0. Two cameras are built into the drone, one forward facing main camera and a secondary camera facing down. Additionally there is a height sensor and internal sensors for flight stability. Due to payload capacity restrictions on the AR-Drone 2.0, we will not be mounting any additional hardware on the drone.

For interfacing and control we are planning to use some existing java libraries. We will be using our own computers to process the data.

Materials

- AR-Drone 2.0 (existing at school)
- New batteries for the drone (4pcs)
  http://no.midhobby.com/produkter-no/100-helikopter--droner-rc/32460-parrot-ar-drone-20-lipo-batteri-111v-1500-mah/
- Hula-hoops 76cm diameter(3pcs)
  http://www.toysrus.no/brshop/vaare-kategorier/rockering-76-cm-lilla?id=615929&vid=470855l
- PS3 controller with USB 2.0 cable (1 pcs)
  http://www.expert.no/spill-og-underholdningkonsolltilbehoerkontrollere/ps3-dual-shock-3-metallic-grey/p/23593/?utm_source=prisjakt&utm_medium=cpc&utm_campaign=prisjakt
- Computer (provided by the students)
- Spray paint (Red or Green)