Aerial Tracking With Turtlebot

Team 1
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We plan to have a nanocopter (Crazyflie) guide the Turtlebot to a specified position by having the Kinect camera mounted on the Turtlebot track the position of the nanocopter. The complexity of using a mobile camera to track a flying object makes this an interesting problem. Possible Motivations include using a drone to lead and guide a convoy of trucks.

The nanocopter would be fitted with a colored Ping-Pong ball to facilitate tracking. The Turtlebot would wander around its environment in search of the nanocopter. We plan to use the cmvision library of ROS to detect the and track the ping pong ball attached to the Crazyflie. Once detected, the Turtlebot then moves toward the Crazyflie position until it is about 1 meter away from the Crazyflie. If the nanocopter changes position, then the Turtlebot should move to maintain this relative position by moving with the nanocopter.

For Test Scenarios, we would just have the Turtlebot follow the Crazyflie with 2 test conditions:

a) Linear movement: The Turtlebot is presently at the 1 meter position from the Crazyflie and the copter moves forward. The Turtlebot should move forward to maintain its 1 meter position from the Crazyflie.
b) Lateral movement: The Turtlebot is presently at the 1 meter position from the Crazyflie and the copter moves sideways. The Turtlebot should rotate to keep the Crazyflie within its field of view.