Simple Hand-Gesture Based Control of Quadcopters

Idea



Research problem

- Recognize the hand (distinguish it from the environment)
- Feature extraction (recognize both a left and a right hand)
- Follow the hand's movement
- Follow the hand's velocity

Approach

- Detect Features using Front Camera
- Apply PCA to get a coordinate frame
- "Lock" the quadcopter-frame with the handframe
- Quadcopter follows height, distance (possible use of Kalman Filter/PID)
- Control roll and yaw (ignore pitch)

Implementation plan

- Extend marker tracking to recognize hand
- Extract Hand-Features
- Track Feature-Points over time (Find robust matches)
- Compute the Transformation between old Hand-Pose and new one
- Apply Transformation to AR-Drone

Future work

- If the wrist/person rotates the quadrocopter should follow in a circular motion
- Closing the fist should make the quadrocopter land
- Changing hands in-flight
- Etc..