Free navigation of the quadrocopter via visual waypoints
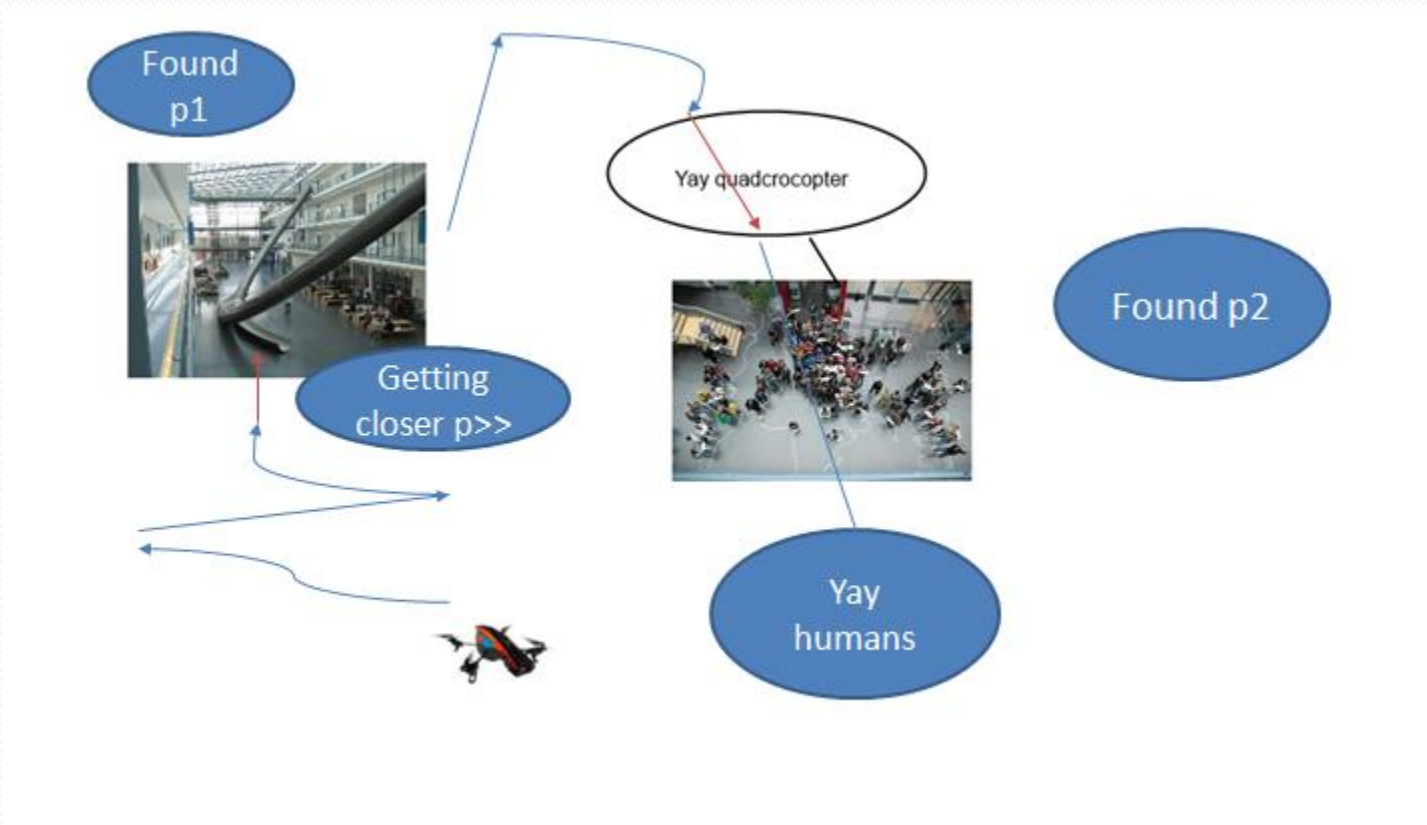
Group 7

Burcu Karadeniz

Artyom Topchyan

Wolfgang Schwan

Idea of our approach

Challenges

- Integrating an appearance based SLAM method
- Correctly updating the position estimation
- Safely navigating without crashing the robot (for simplification probably assumption of no obstacles in the way)
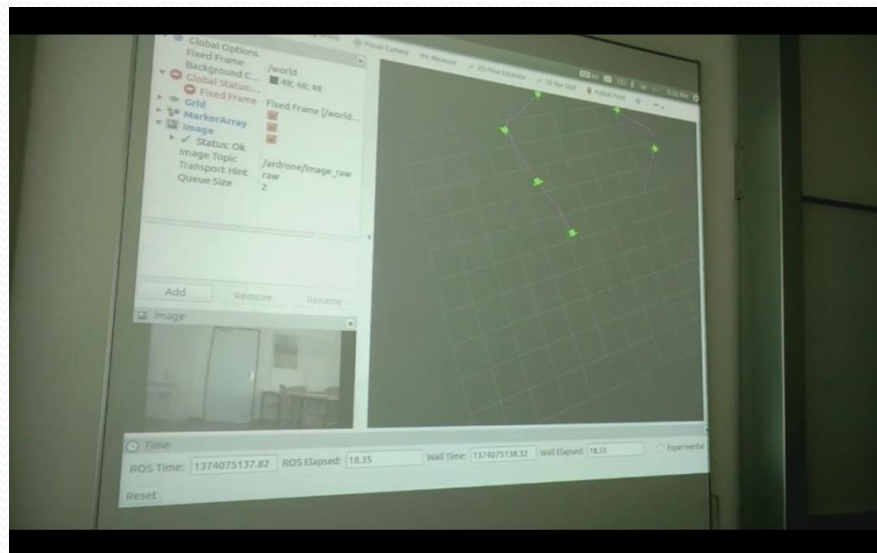- Creating the road-map for the navigation

Challenges

- Integrating an appearance based SLAM method
  - Ros-Node OpenFABMAP
  - Trained with two different bagfiles (different rooms) to generate Bag of Words
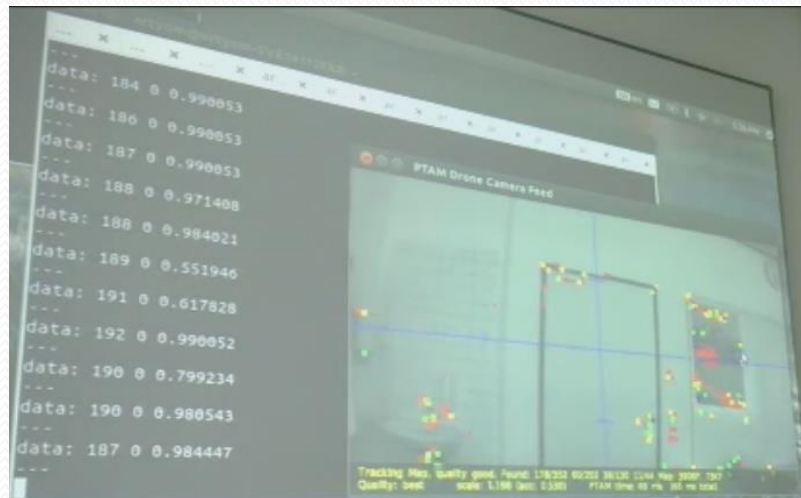
Challenges

- Correctly updating the position estimation
  - Problems with basic pose estimation
  - Uncertainty increases very fast
 - Not feasible for our approach

Solution

- TUM_Ardrone Autopilot

Challenges

- Safely navigating without crashing the robot (for simplification probably assumption of no obstacles in the way)
  - Assumption: No Obstacles
  - Position of next waypoint sent to Autopilot
  - Autopilot navigates freely to position

Challenges

- Creating the road-map for the navigation
  - Pre-generated position and orientation
  - After recognizing a place, going to next waypoint
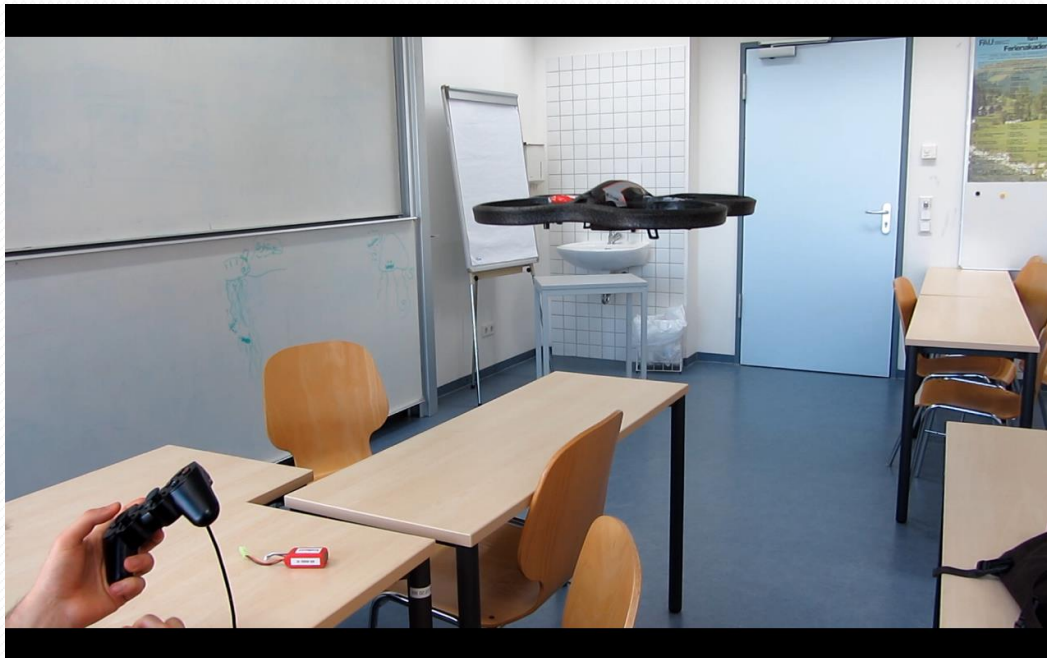
Future improvements

- Navigating randomly to known places based on probability of recognition
- If a place is not recognized → random search

Thank you!

Any questions?