THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF ELECTRONIC & COMPUTER ENGINEERING

Introduction to Aerial Robotics
Project 3 Phase 3 (Lab 3)

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Logistics of Lab3

1. Setup Real-sense SDK and Real-sense ROS package
2. Test VO based on Real-Sense
3. Test EKF and fly your trajectory(map is mentioned in later pages)

Lab3 Outcome

- Deploy your augmented EKF on the quadrotor and perform a trajectory tracking
- Demo it to TA before deadline (MUST!)
- Remember to take a demo video for review.
- Submission:
  - A group project report (Max 4 pages)
  - Your own ros packages (e.g. VO, EKF, etc.)

Demo

- Can fly in API mode with position control
  - Remember do not use OptiTrack data in your algorithm
  - We will test your quadrotor without OptiTrack
- Can fly a trajectory from specified start point to the end
  - Do not hit obstacles. Their position is provided for you
  - No restriction on trajectory generation and path planning method. You can using minimum snap, A*, etc. Or you can also use a hard-coded trajectory.

Project Report

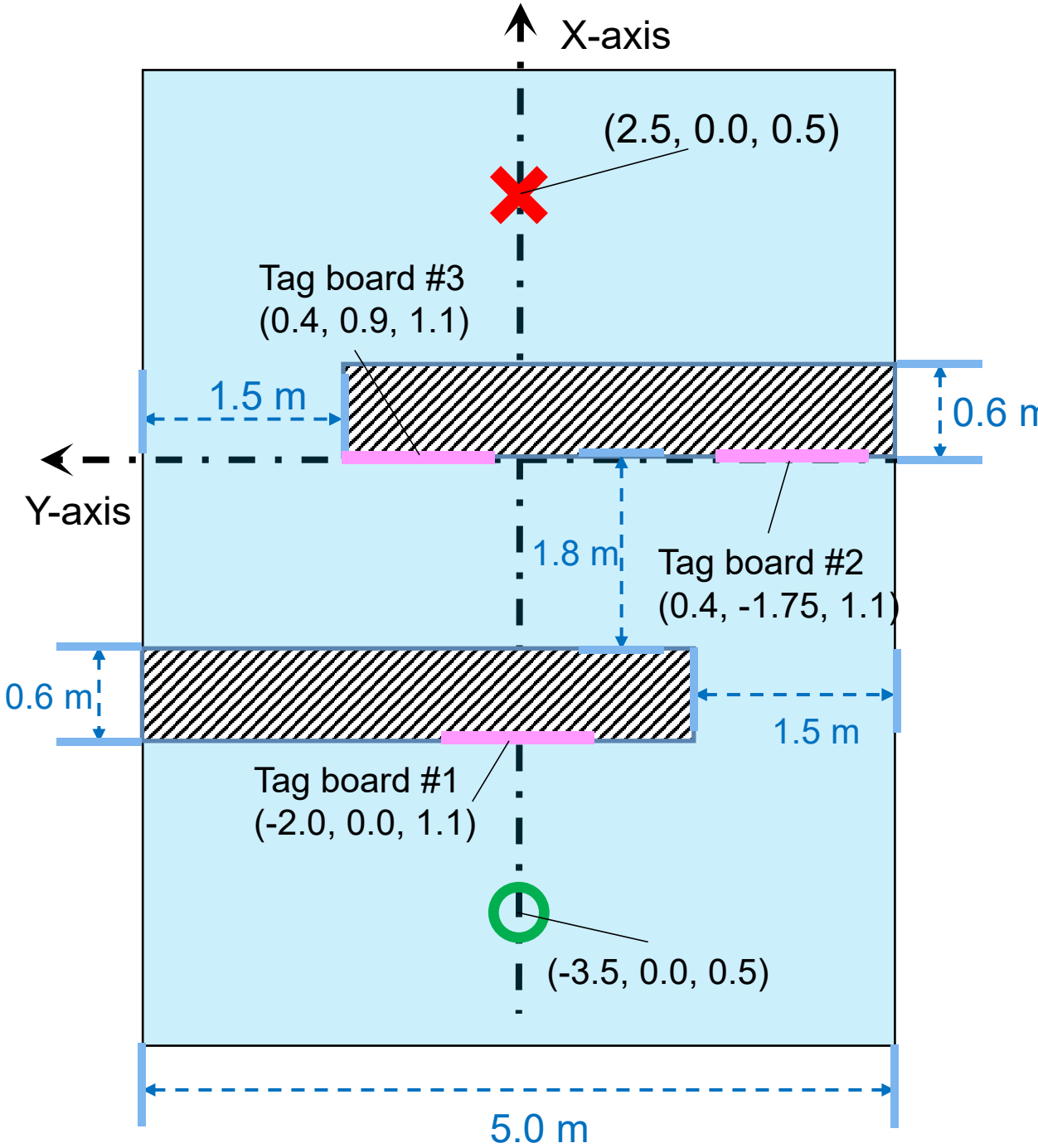
- Figures of the trajectories in Lab3, e.g. comparison between ground truth from OptiTrack and your result.
- Whole pipeline you used to finish Lab3. You are supposed to draw a flow chart including all modules you used, such as A*, trajectory generation, VO, EKF, controller, etc. You are supposed to state how you realize each step with pictures if needed.

Project Report

- Analysis about your experiment result
- Describe everyone’s contribution to your group
- Describe problems you met during the experiment and how you solve them
- Any other things we should be aware of
- Each group only needs to submit one report

Map and Obstacles

- Start/end point is known (green circle&red cross).
- Position of obstacles is known(black).
- Size: 8m * 6m, area
- Height limit: 1.2m



Install Real-sense driver and ROS package

Please refer to README.md

Suggested Workflow for Project 3 Phase 3

- Test your VO with hand hold (Today, Lab3)
- Test your augmented EKF with hand hold
- Test & visualize your augmented EKF with manual flying
- Use your own augmented EKF for hovering
- Use your own augmented EKF for trajectory tracking
- !!! Anything abnormal during flight, switch back to manual control and land immediately
- !!! Clear the flying field if you are going to fly your drone

Enjoy Flight

- Note again: Be careful during your experiments because your robot cost more than HK$ 25,000 !!!