Home Work 3

Mobile Robotics 2015 - ShanghaiTech University

1 Select the paper you will be presenting (30%)

On the lecture of **December 29th**, there will be a session where you should hold a presentation about a robotics paper. Select that paper till next week (more precisely: till **Monday, December 14th, 10pm**). It can be any regular (6 pages or more) paper from the following conference: ICRA 2015 International Conference on Robotics and Automation You can find the program online:

https://ras.papercept.net/conferences/conferences/ICRA15/program/ICRA15_ProgramAtAGlanceWeb.html
http://ieeexplore.ieee.org/xpl/mostRecentIssue.jsp?punumber=7128761

If you find an interesting paper, download it via IEEE explore http://ieeexplore.ieee.org.

You might find video files for your paper in the Multimedia section of the search result. While you can use them to learn about the paper, you are not allowed to use any video in your presentation!

You cannot select a paper that another student is already presenting - first come first serve basis!

Send me an e-mail with your paper mailto:soerensch@shanghaitech.edu.cn as soon as you selected your paper.

Later-on, you might change your selected paper **once**, by sending me an e-mail.

You should start preparing for this presentation as soon as possible. The length of the presentation should be 10 minutes plus five minutes of questions. You can use powerpoint or present a pdf. The presentation has to be held in English ;) . You have to submit your presentation file (.ppt or .pdf) latest **Monday, December 28th, 10pm**.

Send you presentation latest Dec 25th to me and I will give you feedback before your final presentation.

2 Calculate maximum speed (60%)

Consider an omnidirectional robot with a ring of eight 70 KHz sonar sensors that are fired sequentially. Your robot is capable of accelerating and decelerating at 50 cm/ s^2 . It is moving in a world filled with sonar-detectable fixed (nonmoving) obstacles that can only be detected at 5 meters and closer. Given the bandwidth of your sonar sensors, what is the approximate maximum speed the robot can drive while ensuring no collisions?

Assume the speed of sound in air to be 340 meters per second.

Provide all the formulas you are using, show the calculation steps and additionally answer the question with two or three sentences.

3 Submission (10%)

Send the .pdf with the solution of question 2 to soerensch@shanghaitech.edu.cn by Monday, December 14th, 10:00 pm. The subject of the e-mail should have the follow format: `[Mobile Robotics][Homework 3][Pinyin Name]`

If you do not follow the guidlines in this section (subject name) you will loose the 10%!