Autonomous Mobile Robots

Assignment Details

Assignment Details

- Weightage : 10 marks
- Objective of assignment
  - To provide an experience of operating autonomous mobile robots through simulation software
  - To get students to participate in selecting a mobile robot, selecting sensors for it and deploying it,
  - To get students to implement localization and mapping
- Two problem statements are given, you can chose any one and implement

Assignment – why simulation

- Inexpensive
- Can iterate and modify designs
- Behavior will be similar to a real prototype

Assignment Task#1

- Based on the wheel designs and wheel geometries covered in class, create your own mobile robot. Robot can have as many wheels as necessary. Variety in design will be appreciated.
- Make the robot move through simple Lua Script
- Equip robot with a laser rangefinder sensor
- Interface with Python and extract data and generate a real-time plot of the data
- Perform any feature extraction using Python
- Generate Report & Video of final output
  - There is no min or max page limit, video can be 5 mins max.
  - Must clearly describe steps followed taken to achieve project goal with screenshots
  - Must include what each individual contributed

Assignment Task#2

- Install ROS on Ubuntu - choose versions that are compatible with CoppeliaSim
- Use an existing robot and incorporate a laser rangefinder on it
- Acquire data from CoppeliaSim through ROS
- Execute a launch file for perform SLAM using ROS
- Generate report & video of final output
  - There is no min or max page limit, video can be 5 mins max.
  - Must clearly describe steps followed taken to achieve project goal with screenshots
  - Must include what each individual contributed

Thanks!