

16-311

Remote Robotics Simulation Lab

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1 Teleoperation Simulation

You can watch me crash into all kinds of obstacles here:

https://youtu.be/5I_3y66GJwY

1. I selected the basic "camera" and placed it at the suggested location according to the handout alongside the suggested resolution. This allowed me to view the front of the camera. Since the task only requires navigation a basic camera is sufficient.
2. While going up the ramp, there was no way of knowing how far I am from the end. Also it was hard to notice obstacles that were too close and thus outside field of view.
3. There is not as much as need to change the camera itself, rather to add more features, in order to make teleoperation easier. Maybe, using a more advaced camera like the MultiSense S21, could be used. These have left and right cameras and a range finder. There should be further visual information however, including distance to nearest obstacle, orientation of robot (or camera). All this information would help the operator.
4. In a system where there are three people in a team, operating a robot would be divided into subtasks. One person would be in control of driving the robot and performing actions, another member would be recording data, and the third would overlook and guide the entire process. This person, because is able to communicate between the both other members would take the final call. This is how we (team 11) had planned to divide the task in the USAR lab.

2 Autonomous Simulation

You can watch the robot crash into all kinds of obstacles here:

<https://youtu.be/IGVbNf1D1H8>

5. To collect data about the vehicles position I picked the gps node/sensor, as it is able to output the sensor absolute position at a certain timestep.
6. I did not change any sensor values. Except the position on the robot, which is discussed later. The default values were suitable enough for the purposes of the activity.
7. I put it at the same place as the camera to ensure that the checkpoint picture clicked is the most accurate.
8. The answer to optimality depends on the factor in consideration. If safety is a factor then this might not be the most optimal solution as the robot gets really close to the obstacles. However, in terms of distance, the algorithm is able to find a quick and short path.

At the checkpoint, the following image was taken:

