TIAGO NAVIGATION

Implement a routine that lets Tiago navigate inside the environment similar to Figure 1. The environment is composed of two rooms with non-static obstacles (i.e. you can move them in Gazebo) and a narrow space. Tiago has to navigate from point A to point B.
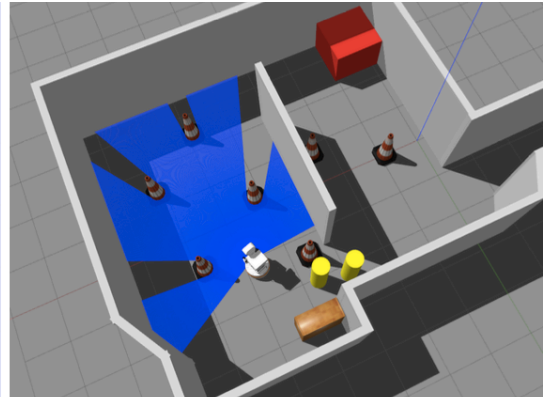

Figure 1   Figure 2

The user can input the position of Point B by command line. In B the robot has to recognize, and output to the screen, the position of the non-static obstacles, e.g. the cones, that are in front of it (Figure 2). The static obstacles that are part of the map, e.g. the walls, haven't to be recognized. Use the laserscan (topic /scan).

Your code must be implemented using **C++** and should follow this structure:

- The user can input the position of point B by command line;
- Your code must be implemented with an Action Client/Server infrastructure:

    1. The action client receives the input from the user;
    2. The action client calls the action server that executes all the task;
    3. The action server sends the final list of positions of the obstacles as results to the action client;
    4. The action client receives feedback from the server and outputs the current status of the task (e.g. the robot is moving, the robot reached point B, etc)

How to Setup the Environment:

A file is attached with name "repository." It includes the worlds (environment with obstacles and tiago), launch and map files. Firstly, add this file in your work_space and build it.

After successfully building it, you can see the environment by executing following command:

```
roslaunch tiago_iaslab_simulation start_simulation.launch world_name:=ias_lab_room_full
```

Moreover, the navigation is also implemented, so **you don't need to code for navigation**. You can execute the navigation stack with following command line in the other terminal:

```
roslaunch tiago_iaslab_simulation navigation.launch
```

!!! Last but not the least, you can also use **RVIZ** for debugging and add maps in it. You can find the maps in "*respository -> tiago_iaslab_simulation -> map*". But, it's totally up to you either you want to use it or not.