

Intelligent Hotel Robot User Manual

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Introduction

Due to the rise of artificial intelligence (AI) technology, discussions are processing on how robots could replace human labor. Base on the conventional surveys, this paper present a conceive on the intelligence hotel robot, which simplify the check-in process. Also considered in different environment settings, robot can self-adaption with the different cases. Combine with the Hokuyo Lidar and Kinect Xbox camera, robot can plan the route accurately, also robot can reach on the different floors.

Focus on the analyses of the numbers inside the elevator walls, we assume that robot have the ability to read the numbers and symbols. Beside, the intelligent voice system provide an assistant for the customers. Furthermore, the intelligent order sending system provide fully-automatic food delivery. However, the hotel not only divides human work but also reconstructs it from tasks.

Moreover, the purpose of reconstruction is not simply for replacement of works. Such modification of task is often observed taking place in human-system interactions. It is an extremely creative process of labor emerging in this area.

Overview

About this manual

This is a technical reference manual intended for the pioneer programmer. The robot base instructions, functions and data types are detailed in this manual.

Usage

This manual should be read during programming and when you need specific information about a pioneer instruction, function or data type.

Who should read this manual?

Engineers who want to use this robot later can view this manual. It is more

convenient to master the principles and operation methods of our robots.

Prepare

1. Install Ubuntu 14.04
2. Install MATLAB
3. Install the related files about navigation and Gmapping by following documents.

<https://collab.udmercy.edu/portal/site/d6c5fe25-5329-4e9d-adf0-212ea9381641/page/a252225d-2fcb-4417-bf9b-ce64f8789abe>

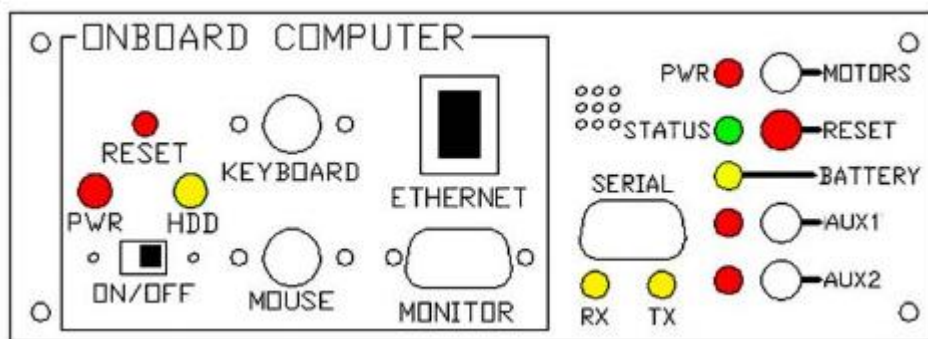
Gmapping_SICK_&_HOKUYO_LIDAR_V02.pdf

<https://collab.udmercy.edu/portal/site/d6c5fe25-5329-4e9d-adf0-212ea9381641/page/a252225d-2fcb-4417-bf9b-ce64f8789abe>

Navigation.pdf

4. Install the speaker

About the pioneer



the board on the robot

The red PWR LED is lit whenever main power is applied to the robot. The green STAT LED state depends on the operating mode and other conditions.

The red RESET pushbutton acts to unconditionally reset the microcontroller

we also need to link the mouse, keyboard, monitor and speaker to the NUC.

How to program robots

1. How to record a map

1) Copy these code in the terminal as following:

Open a new terminal and type the code:

```
$ roslaunch pioneer_bringup laser_lms1xx.launch
```

Open a new terminal and type the code:

```
$ roslaunch gmapping slam_gmapping_pr2.launch
```

Open a new terminal and type the code:

```
$ rviz
```

Open a new terminal and type the code:

```
$ rosrun teleop_twist_keyboard teleop_twist_keyboard.py
```

From the beginning of the setting, the robot is controlled to walk through the keyboard. Control the robot to walk through the range of maps you want to record.

Notice: When you record a map, you can only press one direction key and you cannot press both direction keys at the same time. When controlling the robot to walk, try to walk in the middle of the road, and the speed should be gentle.

2) Save map

We also need to save the map after recording the map

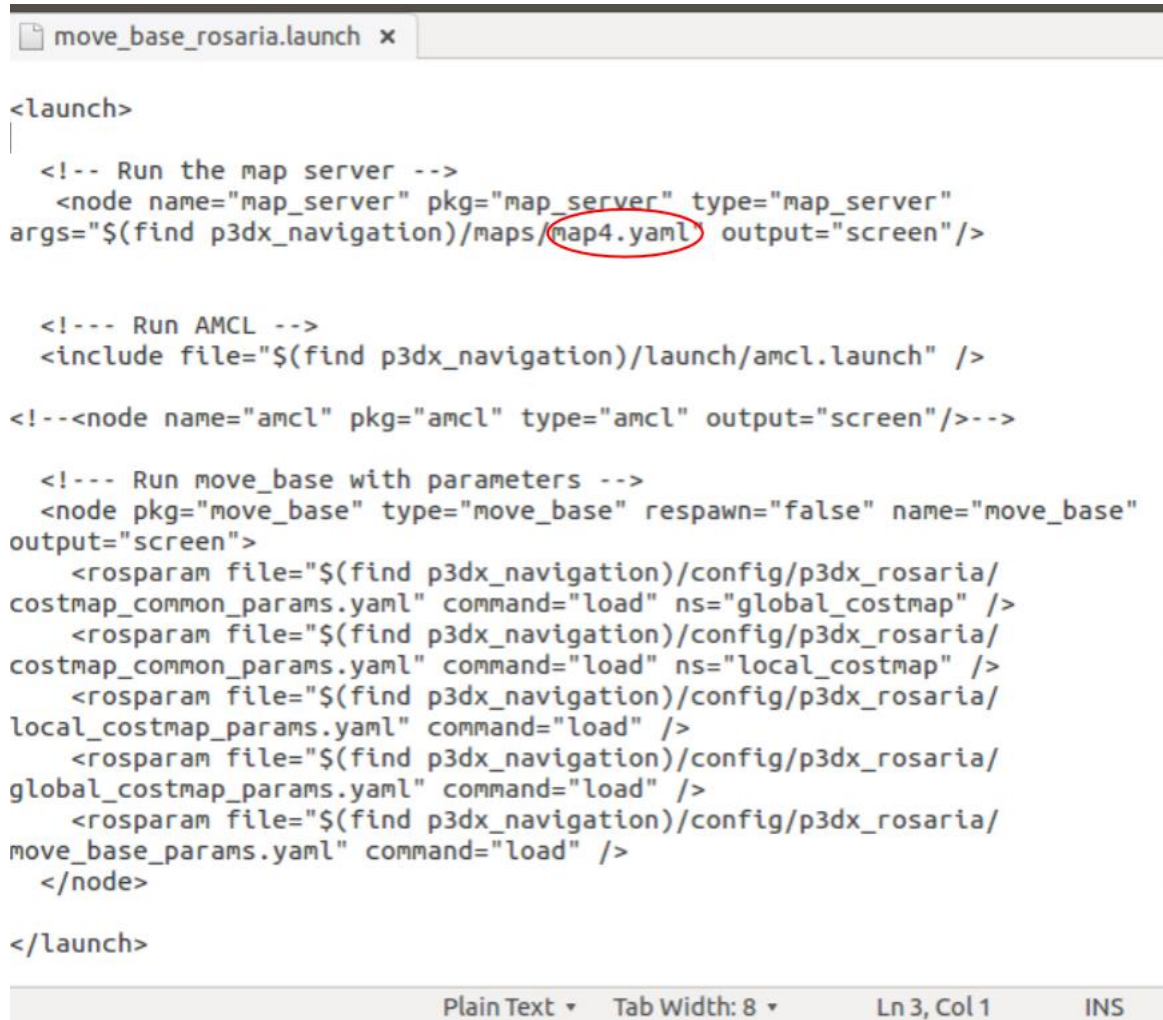
Open a new terminal and type the code:

```
$ rosrun map_server map_saver -f <map_name>
```

Give some name for your map in the filed <map_name>. Now you can close the above terminal and also the terminals you launched for g mapping. Go to the workspace you created ie /home/amrl/catkin_ws directory and you can see two files created there with the name you specified for your map. If you gave the map_name as floor, you will get two files named “floor.pgm” and “floor.yaml”

3) Find the launch file name as move_base_rosaria ,and change something as figure

The name inside the circle should match the name of the map you saved.



```
<launch>
  <!-- Run the map server -->
  <node name="map_server" pkg="map_server" type="map_server"
    args="$(find p3dx_navigation)/maps/map4.yaml" output="screen"/>

  <!-- Run AMCL -->
  <include file="$(find p3dx_navigation)/launch/amcl.launch" />

  <!--<node name="amcl" pkg="amcl" type="amcl" output="screen"/>-->

  <!-- Run move_base with parameters -->
  <node pkg="move_base" type="move_base" respawn="false" name="move_base"
    output="screen">
    <rosparam file="$(find p3dx_navigation)/config/p3dx_rosaria/
    costmap_common_params.yaml" command="load" ns="global_costmap" />
    <rosparam file="$(find p3dx_navigation)/config/p3dx_rosaria/
    costmap_common_params.yaml" command="load" ns="local_costmap" />
    <rosparam file="$(find p3dx_navigation)/config/p3dx_rosaria/
    local_costmap_params.yaml" command="load" />
    <rosparam file="$(find p3dx_navigation)/config/p3dx_rosaria/
    global_costmap_params.yaml" command="load" />
    <rosparam file="$(find p3dx_navigation)/config/p3dx_rosaria/
    move_base_params.yaml" command="load" />
  </node>
</launch>
```

2. How to get the robot to the scheduled room

1) Work on Matlab

(1) Open the Matlab, create a new script , write and run a code.

2) Running step

Open a new terminal and type the code:

\$ roslaunch p3dx_navigation pioneer.launch

Open a new terminal and type the code:

\$ roslaunch p3dx_navigation move_base_rosaria.launch

Open a new terminal and type the code:

\$ roslaunch p3dx_navigation rviz_p3dx.launch

Open a new terminal and type the code:

\$ matlab

Run the program and enter the room number (do not press the enter button first). Unplug the connection between the display and the computer, and the connection between the mouse cable and the computer, then press the enter button and immediately unplug the keyboard from the computer.

Notice:

If something goes wrong, you need to reset the robot. The robot needs to be reset whenever a new task is opened. The red reset button is on the side of the robot.



Notice:

Before starting the task, you need to adjust the starting position of the robot against the map. You need to match the starting position on the map as much as possible.

