Université Paul Sabatier

Master Intelligence Artificielle et
Reconnaissance des Formes
Master Robotique : Décision et Commande

User Manual - Navigation Between Markers

Mobile Robot Navigation

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Broadcast list

User Manual - Navigation Between Markers is distributed to all clients and external stakeholders.

Review history

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Contents

1 Prerequisites

1.1 Equipment

- TurtleBot 2
- AR markers ... (à compléter)

1.2 Software

To be able to use any TurtleBot 2 with all the basic features, you need to complete the following tutorials :

- Turtlebot Installation
- PC Installation
- Network Configuration

You also need the following software :

- GIT [Installation]

1.3 Build workspace

You need a ROS workspace (catkin workspace) to build our project before executing it. If you are running the ball search on the TurtleBot PC you have to create the workspace on the TurtleBot PC. In the case your are running it on a remote PC, you have to create the workspace on this PC.

Place you where you want to build the workspace and execute the following commands :

```
> mkdir -p /catkin_ws/src
> cd /catkin_ws/src
> catkin_init_workspace
> cd ..
> catkin_make
```

Then, in .bashrc, add the following lines (it's normal if some of them are already there) :

```
#Initialisation Turtlebot kinect
export TURTLEBOT_3D_SENSOR=kinect
#ROS Version
source /opt/ros/indigo/setup.bash
source <YOUR_PATH>/catkin_ws/devel/setup.bash
#Select corresponding TurtleBot on your network
export ROS_MASTER_URI=http://<IP_OF_TURTLEBOT>:11311
```

1.4 Download package

Now, you need to download the package containing the source code. Place you in your workspace (catkin_ws), and execute the following commands :

```
> cd src

> git clone https://github.com/Projet-Navigation-UPS/TurtleBot-pkgs
```

1.5 Build executables

Now that you have downloaded the source code, you just need to compile to build the executables files. Place you in your workspace (catkin_ws) and run the command :

```
> catkin_make
```

Several red lines must appear in the compilation description, meaning that the executables we need have been created.

1.6 Map configuration

1.7 Markers configuration

2 Navigation Between Markers

First, you need to turn on the TurtleBot (there is a switch button on the side of the robot base). Then, turn on the TurtleBot PC. We will now launch all the ROS nodes that we need to run our application.

2.1 On the TurtleBot PC

2.1.1 Basic features

If you are using the TurtleBot PC, open two terminals and chronologically execute the following commands to activate the minimal features and the vision features, one on each terminal :

```
> roslaunch turtlebot_bringup minimal.launch
```

```
> roslaunch turtlebot_bringup 3dsensor.launch
```

2.1.2 Navigation

(à compléter)

```
> roslaunch turtlebot_proj_nav navigation.launch
```

2.2 On a remote PC

2.2.1 Basic features

To execute the ball search from a remote PC, fist you have to ssh to the TurtleBot PC to launch the minimal and vision features. Open a fist terminal and write the following commands :

```
> ssh turtlebot@<TURTLEBOTP_IP>
```

```
> roslaunch turtlebot_bringup minimal.launch
```

Then, in a second terminal :

```
> ssh turtlebot@<TURTLEBOTP_IP>
```

```
> roslaunch turtlebot_bringup 3dsensor.launch
```

2.2.2 Navigation

(à compléter)

```
> roslaunch turtlebot_proj_launch navigation.launch
```

2.3 Behaviour of the navigation

(à compléter)