

Project log - Robotica

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1 Setup

OS	Ubuntu 18.04 Ubuntu 20.04
ROS version	melodic noetic
Webots	R2020b revision 1
Target hardware	Raspberry Pi 4B Raspberry Pi 3B+

2 Name

Our team has chosen the name **Change**, which resembles **Chang’e 4** [2], the spacecraft mission part of the second phase of the Chinese Lunar Exploration Program, which achieved humanity’s first soft landing on the far side of the moon.

3 Libraries and environment

We have used the **webots_ros** [3] package in order to gain deeper understanding of how to interface ROS nodes with the standard ROS controller for Webots.

We have also studied the ROS documentation [4] in order to install and configure the ROS environment and also to understand fundamental ROS concepts related to nodes and topics. Moreover, we set-up the ROS interface in Webots following the cyberbotics documentation [4].

4 Task

Our robot will be deployed in a room (such as the one showed in our demo) and its aim is to identify humans and estimate their relative positions. If the distance between said humans is less than a specified value, the robot will go towards them and invite them to respect social distancing (with both visual and audio output).

5 Pioneer 2

The robot selected for the given task is the **Pioneer2**.

Adept's Pioneer 2[1] is a three-wheeled robot (2 motorized wheels and one passive caster wheel) mounted with several sensors including 16 ultrasonic sensors. In order to achieve our goal, it was deemed necessary to add the following devices in the extension slot:

1. compass;
2. gyro;
3. accelerometer;
4. servo;
 - (a) display;

6 ROS

Our team decided to write all the ROS related code in the file `ros_interface.cpp`. The aim was to write a cleaner main function, which is located in the file `change.cpp`.

6.1 Init

References

- [1] <https://www.cyberbotics.com/doc/guide/pioneer2>.
Webots Pioneer 2 documentation.
- [2] <https://www.theguardian.com/science/2019/jan/03/china-probe-change-4-land-far-side-moon-basin-crater>.
The Guardian, 3 January 2019.
- [3] https://github.com/cyberbotics/webots_ros.
Github page for the `webots_ros` package from *cyberbotics*.
- [4] <https://wiki.ros.org/ROS/Tutorials>.
ROS documentation from ROS.org.
- [5] <https://www.cyberbotics.com/doc/guide/tutorial-8-using-ros>.
Cyberbotics documentation.