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# **Cartographer ROS for TurtleBots Documentation**

*Release 1.0.0*

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Cartographer is a system that provides real-time simultaneous localization and mapping (SLAM) in 2D and 3D across multiple platforms and sensor configurations. This repository provides Cartographer SLAM for TurtleBots via Cartographer ROS.



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## Building & Installation

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Installation has been tested on Ubuntu 14.04 (Trusty) with ROS Indigo, but may also work on Ubuntu 16.04 (Xenial) with ROS Kinetic. We recommend using `wstool` and `rosdep`. For faster builds, we also recommend using `Ninja`.

```
# Install wstool and rosdep.
sudo apt-get update
sudo apt-get install -y python-wstool python-rosdep ninja-build

# Create a new workspace in 'catkin_ws'.
mkdir catkin_ws
cd catkin_ws
wstool init src

# Merge the cartographer_turtlebot.rosinstall file and fetch code for
↳dependencies.
wstool merge -t src https://raw.githubusercontent.com/googlecartographer/
↳cartographer_turtlebot/master/cartographer_turtlebot.rosinstall
wstool update -t src

# Install deb dependencies.
# The command 'sudo rosdep init' will print an error if you have already
# executed it since installing ROS. This error can be ignored.
sudo rosdep init
rosdep update
rosdep install --from-paths src --ignore-src --rosdistro=${ROS_DISTRO} -y

# Build and install.
catkin_make_isolated --install --use-ninja
source install_isolated/setup.bash
```





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### Running the demo

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Now that Cartographer, Cartographer ROS, and Cartographer ROS's TurtleBot integration are installed, download the example bag to a known location, in this case ~/Downloads, and use roslaunch to bring up the demo:

```
# Download the example bag.
wget -P ~/Downloads https://storage.googleapis.com/cartographer-public-data/
↳bags/turtlebot/cartographer_turtlebot_demo.bag

# Launch the 2D LIDAR demo.
roslaunch cartographer_turtlebot demo_lidar_2d.launch bag_filename:=${HOME}/
↳Downloads/cartographer_turtlebot_demo.bag

# Launch the 2D depth camera demo.
roslaunch cartographer_turtlebot demo_depth_camera_2d.launch bag_filename:=$
↳{HOME}/Downloads/cartographer_turtlebot_demo.bag

# Launch the 3D depth camera demo.
roslaunch cartographer_turtlebot demo_depth_camera_3d.launch bag_filename:=$
↳{HOME}/Downloads/cartographer_turtlebot_demo.bag
```

The launch files will bring up roscore and rviz automatically.