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# **Cartographer ROS for the Toyota HSR 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 the Toyota HSR via Cartographer ROS.



# CHAPTER 1

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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_toyota_hsr.rosinstall file and fetch code for
↳dependencies.
wstool merge -t src https://raw.githubusercontent.com/googlecartographer/
↳cartographer_toyota_hsr/master/cartographer_toyota_hsr.rosinstall
wstool update -t src

# Install deb dependencies.
rosdep update
rosdep install --from-paths src --ignore-src -r --rosdistro=${ROS_DISTRO} -y

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





## CHAPTER 2

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### Running the demo

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Now that Cartographer and Cartographer's Toyota HSR 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 2D example bag.
wget -P ~/Downloads https://storage.googleapis.com/cartographer-public-data/
↳bags/toyota_hsr/cartographer_toyota_hsr_demo.bag

# Launch the 2D demo.
roslaunch cartographer_toyota_hsr demo_hsr_2d.launch bag_filename:=${HOME}/
↳Downloads/cartographer_toyota_hsr_demo.bag

# Download the 3D example bag.
wget -P ~/Downloads https://storage.googleapis.com/cartographer-public-data/
↳bags/toyota_hsr/cartographer_toyota_hsr_demo_3d.bag

# Launch the 3D demo.
roslaunch cartographer_toyota_hsr demo_hsr_3d.launch bag_filename:=${HOME}/
↳Downloads/cartographer_toyota_hsr_demo_3d.bag
```

The launch files will bring up `roscore` and `rviz` automatically.