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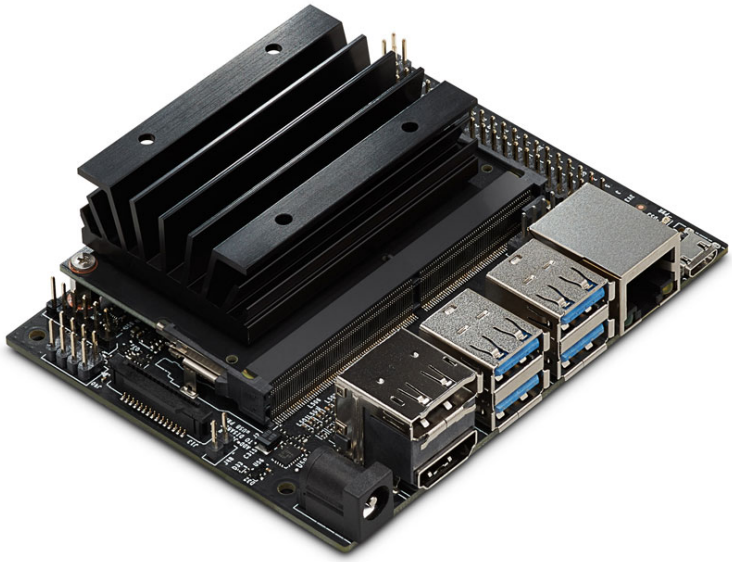
Getting Started with ROS on Jetson Nano

> **The new embedded board from NVIDIA® is an ideal fit for autonomous robotics. Learn how to get started with ROS on the new Jetson™ Nano.**

The Jetson Nano is the latest embedded board of the NVIDIA Jetson family. Designed for autonomous machines, it is a tiny, low power and affordable platform with a high level of computing power allowing to perform real time computer vision and mobile-level deep learning operations at the edge.



Getting Started with ROS on Jetson Nano

ROS is the natural choice when building a multi-sensory autonomous robot. After setting up the Jetson Nano with its JetPack image using our Getting Started (https://www.stereolabs.com/blog/getting-started-with-jetson-nano/) guide, we are going to install the latest version of ROS that runs on Ubuntu 18 Bionic Beaver: Melodic Morenia (http://wiki.ros.org/melodic).

Installation

Open a new terminal by pressing **Ctrl + Alt + t** or executing the "**Terminal**" application using the Ubuntu 18 launch system.

Set up the Jetson Nano to accept software from *packages.ros.org*:

```
$ sudo sh -c 'echo "deb http://packages.ros.org/ros/ubuntu $(lsb_release
```

Add a new apt key:

```
$ sudo apt-key adv --keyserver 'hkp://keyserver.ubuntu.com:80' --recv-ke
```

[***Note**: the ROS GPG key has changed due to a security issue on the ROS build farm server (https://discourse.ros.org/t/security-issue-on-ros-build-farm/9342). If you configured your Jetson Nano for ROS following this guide before the **24th June 2019**, please follow this guide* (https://discourse.ros.org/t/new-gpg-keys-deployed-for-packages-ros-org/9454) *to replace the old key in the correct way*]

Update the Debian packages index:

```
$ sudo apt update
```

Install the ROS **Desktop** package, including support for `rqt`, `rviz`and other useful robotics packages:

```
$ sudo apt install ros-melodic-desktop
```

Note: “ROS Desktop Full” is a more complete package, however it is not recommended for an embedded platform; 2D/3D simulators will be installed with it and they take too much space on ROM, and are too computationally hungry to be used on the Nano.

Initialize **rosdep**. **rosdep** enables you to easily install system dependencies for source code you want to compile and is required to run some core components in ROS:

```
$ sudo rosdep init
$ rosdep update
```

It is recommended to load the ROS environment variables automatically when you execute a new shell session. Update your `.bashrc` script:

```
$ echo "source /opt/ros/melodic/setup.bash" >> ~/.bashrc
$ source ~/.bashrc
```

Now the Jetson Nano is ready to execute ROS packages and become the brain of your autonomous robot.

Configure a catkin workspace

To start running your own ROS packages or install other packages from source (such as the ZED ROS wrapper (https://github.com/stereolabs/zed-ros-wrapper) for example), you must create and configure a `catkin` workspace.

Install the following dependencies:

```
$ sudo apt-get install cmake python-catkin-pkg python-empy python-nose p
```

Create the catkin root and source folders:

```
$ mkdir -p ~/catkin_ws/src
$ cd ~/catkin_ws/
```

Configure the catkin workspace by issuing a first “empty” build command:

```
$ catkin_make
```

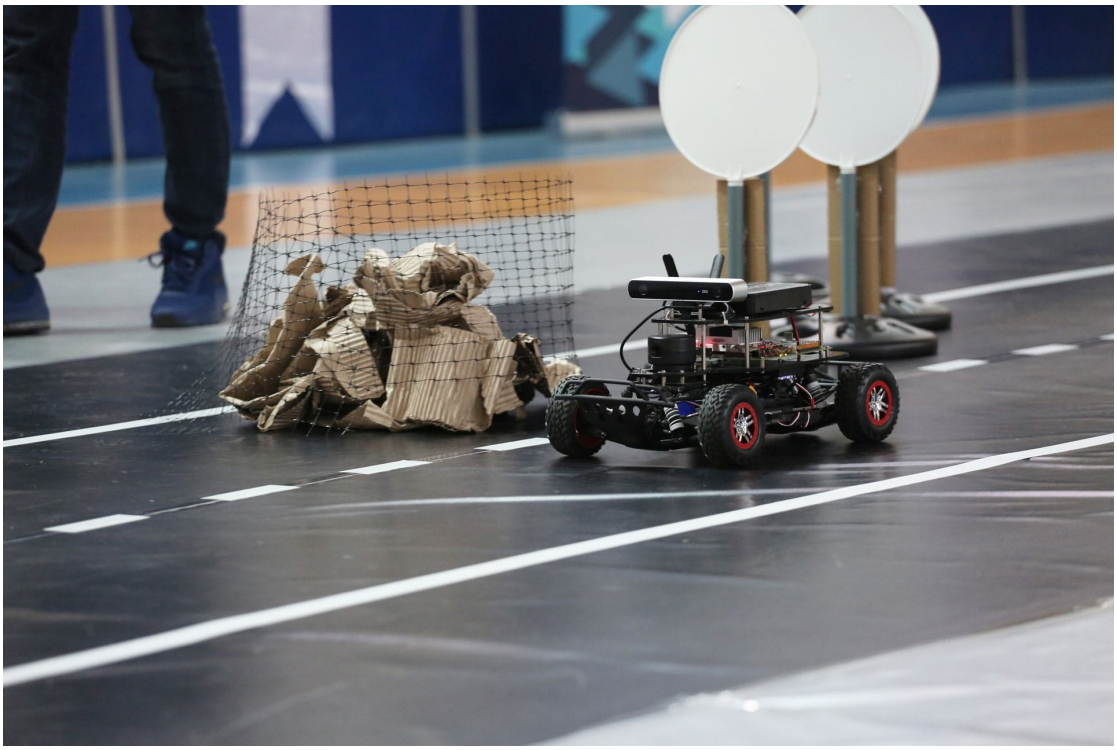
Finally, update your `.bashrc` script with the information about the new workspace:

```
$ echo "source ~/catkin_ws/devel/setup.bash" >> ~/.bashrc
$ source ~/.bashrc
```

Your catkin workspace is now ready to compile your ROS packages from source directly onto the Jetson Nano.

Getting Started with ZED stereo camera on Jetson Nano

How can a robot be autonomous without perceiving the world? The ZED (https://www.stereolabs.com/zed/) and ZED Mini (https://www.stereolabs.com/zed-mini/) 3D depth cameras are the ideal companions for a Jetson Nano and ROS-powered robot.



To get your ZED running with ROS on Nano, go to the source folder of the catkin workspace that you just created:

```
$ cd ~/catkin_ws/src
```

Clone the ZED ROS wrapper (https://www.stereolabs.com/docs/ros/) Github repository. The ZED wrapper allows you to add real-time depth sensing, stereo visual odometry, and 3D SLAM to your autonomous robot.

```
$ git clone https://github.com/stereolabs/zed-ros-wrapper.git
```

Check the dependencies:

```
$ cd ~/catkin_ws
$ rosdep install --from-paths src --ignore-src -r -y
```

The `rosdep` command explores all the packages available in the `src` folder and verifies that all the declared dependencies are available, automatically installing the missing ones.

Compile the ZED ROS wrapper:

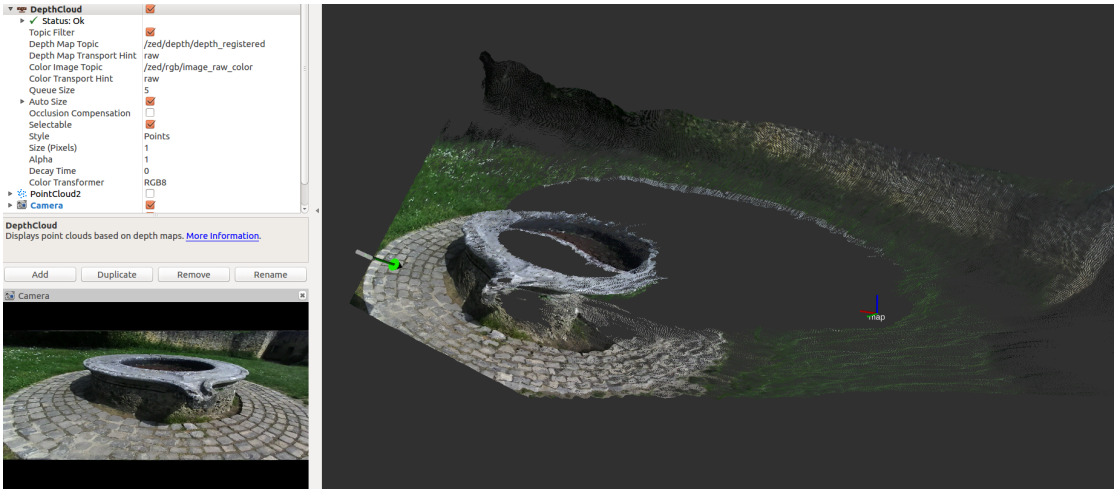
```
$ catkin_make -DCMAKE_BUILD_TYPE=Release
```

You can now visualize the video and depth data that your ZED camera captures using this simple command:

```
$ roslaunch zed_display_rviz display.launch
```

For ZED Mini:

```
$ roslaunch zed_display_rviz display_zedm.launch
```



For more information on using the ZED ROS wrapper, read our Getting Started (https://www.stereolabs.com/docs/ros/) guide.

If you need help with setting up ROS on your Jetson Nano or using your ZED stereo camera, don't hesitate to contact us on the support (https://support.stereolabs.com/) portal or Github issue system. (https://github.com/stereolabs/zed-ros-wrapper/issues)

TAGS

NVIDIA JETSON (HTTPS://WWW.STEREOLABS.COM/BLOG/TAG/NVIDIA-JETSON/)

NVIDIA JETSON NANO (HTTPS://WWW.STEREOLABS.COM/BLOG/TAG/NVIDIA-JETSON-NANO/)

ROS (HTTPS://WWW.STEREOLABS.COM/BLOG/TAG/ROS/)

ROS MELODIC (HTTPS://WWW.STEREOLABS.COM/BLOG/TAG/ROS-MELODIC/)

ZED STEREO CAMERA (HTTPS://WWW.STEREOLABS.COM/BLOG/TAG/ZED-STEREO-CAMERA/)

ZED-M (HTTPS://WWW.STEREOLABS.COM/BLOG/TAG/ZED-M/)

PREVIOUS POST

NEXT POST

Introducing ROS2 Wrapper for ZED (https://www.stereolabs.com/blog/zed-wrapper-for-ros2/)

Announcing ZED SDK for Jetson Nano (https://www.stereolabs.com/blog/announ zed-sdk-for-jetson-nano/)