

How to integrate Mask-RCNN with ROS??

Note: Steps tested on ROS Melodic

Note that following requirements are fulfilled on your Ubuntu system:

h5py==2.7.0	
Keras==2.1.2	or Keras 2.0.8+
numpy==1.13.3	
rviz==1.12.13	(if you have Ros , rviz will be already there so need to install separately just check the version >= 1.12.13)
scikit-image==0.13.0	
scikit-learn==0.19.1	
scipy==0.19.1	
tensorflow-gpu==1.4.1	or TensorFlow 1.3+

Currently in my system following libraries and there version are installed :

h5py==2.7.0
Keras==2.1.2
numpy==1.16.6
rviz==1.13.15
Scikit-learn (no Scikit-learn, it is optional may be)
scikit-image==0.14.2
scipy (no spicy, may be it is optional)
Tensorflow==1.14.0

Steps:

Step-1:

Create a new workspace named “catkin_ws” (if you already have it you can skip this step):

```
mkdir -p ~/catkin_ws/src
cd ~/mrcnn_ros_ws/
cd src
git clone https://github.com/akio/mask_rcnn_ros.git
cd ..
catkin build
```

Note: if you do not have catkin build then install catkin_tools
(if the above command runs well then skip the following step)

```
sudo pip install -U catkin_tools
```

Step-2:

Make catkin_ws your current working workspace of ROS to access all packages.

Now, go to home directory and type `gedit ~/.bashrc`

Then change the following line in the bashrc:

```
source ~/mrcnn_ros_ws/devel/setup.bash
```

And then open a new terminal.

Above process will change your ROS_PACKAGE_PATH to mrcnn_ros_ws, so that you can access the packages installed in this workspace.

Step-3:

Download the mask rcnn weight file from the following link: [mask_rcnn_coco.h5](#)
and save the ‘mask_rcnn_coco.h5’ in a certain location.

Open the file: `/home/kena/mrcnn_ros_ws/src/mask_rcnn_ros/nodes/mask_rcnn_node`
and give the path of the weight file i.e, mask_rcnn_coco.h5’ to the COCO_MODEL_PATH variable as shown in below example

```
# Local path to trained weights file
```

```
COCO_MODEL_PATH = '/home/kena/Downloads/mask_rcnn_coco.h5'
```

Step-4:

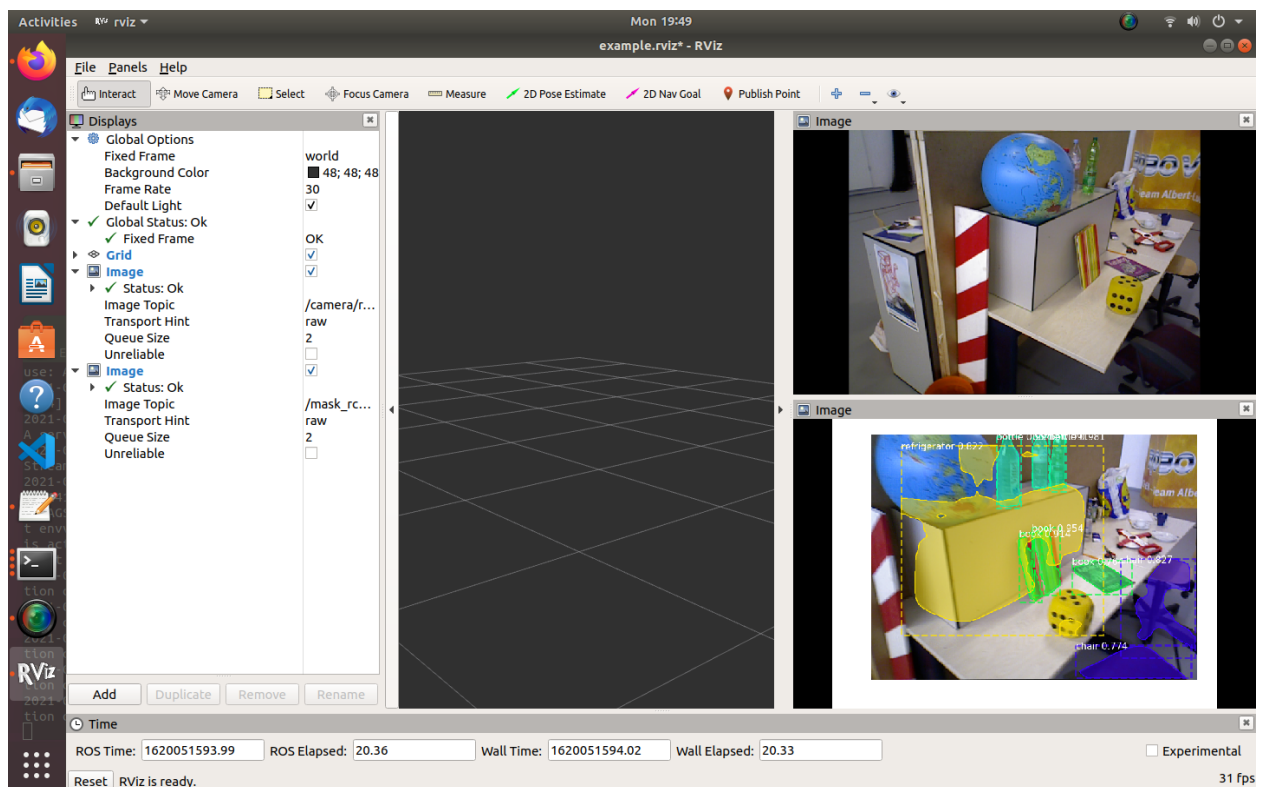
Now, run the following commands:

Go to mrcnn_ros_ws/src , then type the following command:

```
cd mask_rcnn_ros/examples
./download_example_bag.sh
roslaunch example.launch
```

The above command `roslaunch example.launch` will launch mask_rcnn_node to execute with rgbd_dataset_freiburg3_long_office_household.bag file which is an RGBD dataset file.

Now, you can see the rviz window as follows:



To run the node without this .bag file , to use it for your application in gazebo/hardware , download the following file [mrcnn_node.launch](#)
Save mrcnn_node.launch file in the `/catkin_ws/src/mask_rcnn_ros/examples`
Open the file and write the rgb image input topic correctly in place of :

```
<remap from="~input" to="/camera/rgb/image_raw" />
```

Save the file and

Then run the following command to launch mask_rcnn node:

```
roslaunch mask_rcnn_ros mrcnn_node.launch
```

Step-5:

Hence, a node is launched. To visualize the result run the following command:

```
rqt_image_view
```

and select the topic : `/mask_rcnn/visualization` to visualize the result.

Note: To use it with [3DGEMS](#) Dataset, setup this dataset and run it on gazebo while launch turtlebot3 using steps given in [3DGEMS Dataset with Gazebo ROS.pdf](#)
And then launch teleoperation, launch mask_rcnn node and visualize the result via. rqt_image_view as shown above.

Reference: [link](#)