[Discussion] LiDAR Centerpoint Inference Process #2755

✓ **Answered by twbabyduck**   **twbabyduck** asked this question in **Q&A**

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twbabyduck on Jul 26, 2022   edited ▾

The idea is improving the documentation in the `lidar_centerpoint` package and if possible improve the model accuracy.
https://github.com/autowarefoundation/autoware.universe/tree/main/perception/lidar_centerpoint

- [ ] Instructions how to use https://github.com/open-mmlab/mmdetection3d to train on customized dataset.
- [ ] A simple chart to explain the relations between ONNX, TensorRT (.engine) files.
- [ ] Reproduce inference results with lidar_centerpoint
- [ ] Improve lidar_centerpoint trained model accuracy

@yukke42

↑ 1

✓ Answered by **twbabyduck** on Aug 18, 2022

A simple way to test the inference using `lidar_centerpoint` package is shown as follows:

Command

`ros2 launch lidar_centerpoint lidar_centerpoint.launch.xml`
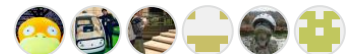
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Category

🙏 Q&A

Labels

`component:percept...`

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6 participants

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2 comments · 13 replies

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twbabyduck on Jul 26, 2022   Author   edited ▾

A simple way to test the inference using `lidar_centerpoint` package is shown as follows: (will edit later in this week)

Command
```
ros2 launch lidar_centerpoint lidar_centerpoint.launch.xml
input/pointcloud:=/INPUT_TOPIC model_name:=centerpoint
```

Terminal

```
Loading from
/home/$USER/autoware/install/lidar_centerpoint/share/lidar_ce...po:
Loading from
/home/$USER/autoware/install/lidar_centerpoint/share/lidar_centerpo:
```

INPUT

`sensor_msgs::msg::PointCloud2`

OUTPUT

`autoware_auto_perception_msgs::msg::DetectedObjects`

Note (Expected Result):
If the lidar point cloud is given then the inference code should be able to
publish the DetectedObjects through above commands.

@yukke42

↑ 1   6 replies

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twbabyduck on Jul 26, 2022   Author

@yukkysaito
There is no issue to follow the tutorial and it can definitely detected the
objects. The question is the `lidar_centerpoint` should be able to
execute separately. Please confirm that if you can execute and get the
detected objects from `lidar_centerpoint` node.

```
ros2 launch lidar_centerpoint lidar_centerpoint.launch.x
input/pointcloud:=/INPUT_TOPIC model_name:=centerpoint
```

yukkysaito on Jul 26, 2022   Maintainer

It need tf (world to base link, base link to sensor frame id) to
concatenate multi frame.
So, you need to try with sensing and localization module.

if multi frame is enable, it need tf.
But now, in single frame mode, it need tf. I think it should be changed
not to need tf.

yukkysaito on Jul 26, 2022   Maintainer

@yukke42 How about?

twbabyduck on Jul 26, 2022   Author

Thanks for clarification! As we discussed in Discord, do we want to
make a plan to provide single frame mode.

twbabyduck on Aug 12, 2022   Author   edited ▾

As discussed in the discord channel. If developer choose to user their own rosbag to test autoware perception package instead of using the data from this [tutorial](#)

They have to check the following steps:
(1) **lanelet2_map.osm** and **pointcloud_map.pcd** for the map
(2) a rosbag recorded at the same place of (1) so that autoware's localization module can publish **tf** information

However, in the step (1) some developers might not have corresponding (.osm) and considering they only want to test perception, it appears that the (.osm) should not be the necessary information. So, in this case should we provide instruction about this?

As for the step (2), what are the related packages have to modify in order to test the perception code so that the `tf` can properly generated from localization and sensing module with their own rosbag? (e.g. Modifications of concatenating point clouds, ...)

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twbabyduck on Aug 18, 2022 · (Author) · edited ▾

A simple way to test the inference using `lidar_centerpoint` package is shown as follows:

Command
```
ros2 launch lidar_centerpoint lidar_centerpoint.launch.xml
input/pointcloud:=/INPUT_TOPIC model_name:=centerpoint
```

Terminal

```
Loading from
/home/$USER/autoware/install/lidar_centerpoint/share/lidar_ce...po
Loading from
/home/$USER/autoware/install/lidar_centerpoint/share/lidar_centerpo
```

INPUT
`sensor_msgs::msg::PointCloud2`

OUTPUT
`autoware_auto_perception_msgs::msg::DetectedObjects`

Note (Expected Result):
If the lidar point cloud is given then the inference code should be able to publish the DetectedObjects through above commands.

Update
The original setup in `lidar_centerpoint` by default its **densification** process is enabled, so it means that the input of `lidar_centerpoint` requires the **localization** module to publish **tf** info

For those who want to test the `lidar_centerpoint` performance, you can use the above commands with the following steps:

(1) Check your input point cloud message's **frame_id** if you want to use **localization** module for the densification process make sure frame_id is `base_link`

(2) If your point cloud simply wants to check `lidar_centerpoint` visualization and ignore thr other setups, just to make sure go into the autoware workspace to enable rviz plugin visualization, then you can check the output topic named `/objects` with the corresponding `frame_id` in your point cloud's topic.

Hope the above description can assist those who want to test the `lidar_centerpoint` separately.
The details of the steps will update soon 😃

✅ Marked as answer   ↑ 2   👍 4   7 replies

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YueChuCheng on Sep 14, 2022   edited ▾

And I'm curious. Can I test lidar_centerpoint with local data? For example, input .pcd or .bin into centerpoint model and output detection result?

yukke42 on Sep 20, 2022   edited ▾

@YueChuCheng
Sorry for the late reply. We now trying to support to inference with rosbag w/o tf or pcd file.

lhakim85 on Sep 21, 2022   (Collaborator)

@YueChuCheng,
I try this run with my rosbag, I can get the ouput, but the result not so ok, sometime there is bounding box, sometime, no, maybe because input feed to the lidar centerpoint is raw pointcloud, not the rectified, need to figure it out.
My step

1. ros2 bag play coplace_0.db3 -l --remap /velodyne_points:=/sensing/lidar/top/rectified/pointcloud_ex
2. edit /config/obstacle_segmentation/ground_segmentation/ground_seg mentation.param.yaml to include base_frame: velodyne
3. run ros2 launch perception.launch.xml
4. open rviz2, change the fixed frame to velodyne frame
5. add object detection by topic

YueChuCheng on Oct 3, 2022   edited ▾

@lhakim85 Thanks for your reply, but how can you visualize the "autoware_auto_perception_msgs/msg/DetectedObjects" topic with rviz2? I mean, I can't find any topic for bbox results.

lhakim85 on Oct 3, 2022 Collaborator

@YueChuCheng, for LiDAR Centerpoint, the topic is /perception/object_recognition/detection/centerpoint/objects.

Answer selected by **twbabyduck**