Added new Ground Filter (Ring based) #655

New issue

Merged **yk-fujii** merged 14 commits into `develop` from `feature/lidar_filter` on Aug 4, 2017

Conversation 42 Commits 14 Checks 0 Files changed 5 +415 −105

n-patiphon commented on May 23, 2017 Member

Added new ground Filter node, modified CMake and package.xml. Add ground filter option to runtime interface.

n-patiphon and others added 6 commits 7 years ago

New version of ground_filter	877a14a
Try to add interface	8ebdf3e
Test adding interface	b770b58
Change yaml file in runtime_manager	c70d2e2
Merge branch 'develop' into feature/lidar_filter	52c423b
-Standarized code ...	bfe9988

amc-nu commented on Jul 25, 2017 • edited Member

Could you please check this one @yk-fujii @dejanpan @messi49 ?
Workflow of testing:
Input:
/points_raw (Velodyne PointCloud)
Output:
/points_no_ground (Velodyne PointCloud with Ground Filtered)
/points_ground (Velodyne PointCloud including only the points estimated as ground)

How to run:

1. Play ROSBAG with velodyne sensor data
2. Run velodyne_pointcloud conversion node (if necessary)

Reviewers
amc-nu
dejanpan

Assignees
No one assigned

Labels
version:autoware-ai

Projects
None yet

Milestone
No milestone

Development
Successfully merging this pull request may close these issues.
None yet

6 participants

3. Run this filter
   `rosrun points_preprocessor ground_filter _sensor_model:=X`

Where X might be 16, 32, 64 according to the number of beams of the Velodyne Sensor

If you wish to include Euclidean clustering in the test, set the Euclidean cluster params to:

1. *remove_ground* to False
2. *input_point_clound* to points_no_ground

Referencing autowarefoundation/autoware_ai#949

dejanpan self-assigned this on Jul 25, 2017

dejanpan reviewed on Jul 25, 2017

View reviewed changes

dejanpan left a comment

Trying to compile with `catkin_make -j1` but getting the following compile error:

```
[ 79%] Building CXX object
sensing/filters/packages/points_preprocessor/C
/home/dejan/Autoware/ros/src/sensing/filters/package
fatal error: velodyne_pointcloud/point_types.h:
No such file or directory
compilation terminated.
sensing/filters/packages/points_preprocessor/CMakeFi
recipe for target
'sensing/filters/packages/points_preprocessor/CMakeF
failed
make[2]: ***
[sensing/filters/packages/points_preprocessor/CMakeF
Error 1
CMakeFiles/Makefile2:18369: recipe for target
'sensing/filters/packages/points_preprocessor/CMakeF
failed
make[1]: ***
[sensing/filters/packages/points_preprocessor/CMakeF
Error 2
Makefile:138: recipe for target 'all' failed
make: *** [all] Error 2
Invoking "make -j1" failed
```

This is another reason why we should actually implement a PR builder.

ros/src/sensing/filters/packages/points_preprocessor/nodes/ground_filter/ground_filter.cpp Outdated

```
16 + {
17 +         GROUND = 0,
18 +         VERTICAL = 1,
19 +         UNKNOWN = 3
```

dejanpan on Jul 25, 2017

Why UNKNOWN = 2?

amc-nu on Jul 25, 2017 Member

Indeed

ros/src/sensing/filters/packages/points_preprocessor/interface.yaml Outdated

```
...  ...   @@ -0,0 +1,3 @@
 1  + - name: ground_filter
 2  +   publish: [/points_lanes, /points_
 3  +   subscribe: [/points_raw]
```

dejanpan on Jul 25, 2017

I couldn't see where is this file used? You still define subcriber/publisher topics in the launch file and cpp code itself.

amc-nu on Jul 25, 2017 Member

file removed

ros/src/sensing/filters/packages/points_preprocessor/nodes/ground_filter/ground_filter.cpp

```
52 +         boost::chrono::high_resolut
53 +         boost::chrono::nanoseconds
54 +
55 +         const int       DEFAULT_HOR
```

dejanpan on Jul 25, 2017

this could be any integer number?

amc-nu on Jul 25, 2017 • edited Member

It's a value in the middle, supposing around 0.18 degrees of azimuth resolution

ros/src/sensing/filters/packages/points_preprocessor/nodes/ground_filter/ground_filter.cpp Outdated

```
49        -         node_handle_.param<std::str
          104 +     points_node_sub_ = node_hand
          105 +     groundless_points_pub_ = noc
          106 +     ground_points_pub_ = node_ha
```

dejanpan on Jul 25, 2017

In general I always ask why the buffer queue is 10? That number normally depends on how fast the messages come in and how long the computation time takes for subscribers. If timing is violated then there should be a warning message.

Here a good explanation on queue size on the publishing side: http://wiki.ros.org/rospy/Overview/Publishers%20and%20Subscribers#Choosing_a_good_queue_size

amc-nu on Jul 25, 2017 Member

Indeed, noted

ros/src/sensing/filters/packages/points_preprocessor/nodes/ground_filter/ground_filter.cpp Outdated

```
          155 +     for (size_t i = 0; i < in_c
          156 +     {
          157 +         double u = atan2(in_
          158 +         if (u < 0) u = 360 +
```

dejanpan on Jul 25, 2017

I would always suggest to use curly brackets

amc-nu on Jul 25, 2017 Member

noted

ros/src/sensing/filters/packages/points_preprocessor/nodes/ground_filter/ground_filter.cpp Outdated

```
          182 +                                 doul
          183 +                                 doul
          184 +                                 doul
          185 +                                 doul
```

dejanpan on Jul 25, 2017

can this result in division by 0?
EDIT: yes if x0 and y0 == 0

amc-nu on Jul 25, 2017 Member

this should never happen due to the Sensor specs, but the check was added

ros/src/sensing/filters/packages/points_preprocessor/nodes/ground_filter/ground_filter.cpp Outdated

```
47  72    {
    73  +         ROS_INFO("Inititalizing Grou
    74  +         node_handle_.param<std::str
```

dejanpan on Jul 25, 2017

Put ROS_INFO into 2 lines.
It would be in general great to stick to max line length 120 chars and to enforce this with a linter: http://wiki.ros.org/roslint.

Otherwise I right now have to actually review this offline.

amc-nu on Jul 25, 2017 Member

Noted

ros/src/sensing/filters/packages/points_preprocessor/nodes/ground_filter/ground_filter.cpp Outdated

```
    98  +                 case 16:
    99  +                     default_hor
    100 +                     break;
    101 +         }
```

dejanpan on Jul 25, 2017

It is always great practice to have default in switch statement(s):
https://stackoverflow.com/questions/4649423/should-switch-statements-always-contain-a-default-clause

amc-nu on Jul 25, 2017 Member

Noted

ros/src/sensing/filters/packages/points_preprocessor/nodes/ground_filter/ground_filter.cpp

```
107 318
108     -         RemoveFloor(current_sensor_
    319 + }
```

dejanpan on Jul 25, 2017

I reviewed above algorithm but having some documentation would actually help. You are doing gradient on the vertical beams, right?

amc-nu on Jul 25, 2017 Member

@n-patiphon could you please share the paper ?

n-patiphon on Jul 26, 2017 Member Author

@amc-nu @dejanpan apologies for slow response, I don't have full documentation explaining the algorithm yet. However, I do have some PowerPoint slides which explain main idea of the algorithm. In case you would like to take a look, I uploaded it to the following link https://drive.google.com/file/d/0B8iMqYxCmvZAZGRVOUhVQmhsSVE/view?usp=sharing

dejanpan on Jul 26, 2017

@n-patiphon this is great, exactly something like this I had in my mind.
@amc-nu If I understand correctly you guys keep documentation in: https://github.com/CPFL/Autoware-Manuals, no?

If that is correct I propose that @n-patiphon
a)generates a pdf from above gdoc,
b) uploads it https://github.com/CPFL/Autoware-Manuals/tree/master/en
c) We add the following line here: https://github.com/CPFL/Autoware/blob/046b973dae7e21b1cfa73f772fade9557e5b1157/ros/src/sensing/filters/packages/points_preprocessor/nodes/ground_filter/ground_filter.cpp#L5
"Algorithm is documented here "

`ros/src/sensing/filters/packages/points_preprocessor/nodes/ground_filter/ground_filter.cpp` Outdated

```
221 +
222 +
223 +
224 +
```

dejanpan on Jul 25, 2017

new line

amc-nu on Jul 25, 2017 Member

noted

dejanpan commented on Jul 25, 2017

This fixed the compile error:
points_preprocessor.txt

Still Qt linking error:

```
 [93%] Linking CXX executable
/home/dejan/Autoware/ros/devel/lib/points_prep
/usr/bin/ld: cannot find -lQt5::Core
collect2: error: ld returned 1 exit status
sensing/filters/packages/points_preprocessor/CMakeFi
recipe for target
'/home/dejan/Autoware/ros/devel/lib/points_preproces
failed
```

Modified as suggested by **@dejanpan** on #655 — d951660

dejanpan commented on Jul 25, 2017

ok, giving up on the linker error. I commented out 2 instances of Qt5::Core in

- /home/dejan/Autoware/ros/src/sensing/polygon/packages/points2polygon/CMakeLists.txt
- /home/dejan/Autoware/ros/src/computing/perception/detection/packages/road_wizard/CMakeLists.txt

but still get the error.

Any help would be appreciated.

amc-nu commented on Jul 25, 2017 — Member

working on that one, pushing soon the fix

amc-nu commented on Jul 25, 2017 — Member

@dejanpan can you please check if you can link now?

amc-nu and others added 2 commits 7 years ago

Fixed linking error on 16.04 — ea10395

Fixed a bug that caused missing points — 046b973

n-patiphon commented on Jul 26, 2017 Member Author

@amc-nu thank you so much for cleaning up my messy code. If you could give me a suggestion about what documentation I should read in order to code properly, I would be really grateful.

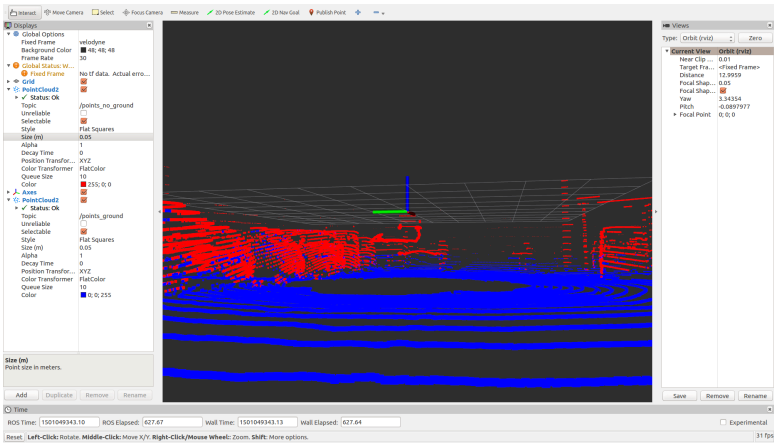
Actually, this version has some bugs in it. Some points are missing. Meaning that those points have never been published. I will commit the fixed one based on your revised version now.

dejanpan commented on Jul 26, 2017 • edited

I tried the code on this bag: http://db3.ertl.jp/autoware/sample_data/sample_moriyama_150324.tar.gz using these commands:

```
$ rosbag play sample_moriyama_150324.bag
$ rosrun points_preprocessor ground_filter
_sensor_model:=32
$ rosrun rviz rviz
```

Then I added blue point cloud as ground and red point cloud as non ground. From the attached screenshot you will see that blue point reach densely up to 0.5m above the ground and some sparse blue points are also way above the ground. So I'd conclude that the algorithm doesn't quite work correctly yet.



How should we do, merge this PR and create an issue to fix the algorithm or we improve the algorithm in this branch?

dejanpan reviewed on Jul 26, 2017

View reviewed changes

ros/src/sensing/filters/packages/points_preprocessor/nodes/ground_filter/ground_filter.cpp Outdated

```
204 +                                   }
205 +                                   else
206 +                                   {//
207 +
```

dejanpan on Jul 26, 2017

this line here gets executed very often and it is not obvious to me why

amc-nu on Jul 26, 2017 • edited Member

I'm I'll check this with @n-patiphon Before merging
Thanks

Typo Fix 29b934b

dejanpan commented on Jul 31, 2017

@amc-nu @n-patiphon what are we gonna do with this PR? Did you see my latest commit?

amc-nu commented on Jul 31, 2017 • edited Member

@dejanpan we're deciding now.
I think the best would be to merge and fix it, like you mentioned.@n-patiphon will add a README and a launch file before merging.

yk-fujii mentioned this pull request on Jul 31, 2017

fixes #752 #753 Merged

dejanpan commented on Jul 31, 2017

I am fine with that. Will you create an issue for fix?

amc-nu commented on Jul 31, 2017 Member

Yes, I'm just waiting for feedback from @n-patiphon to proceed.

dejanpan commented on Aug 1, 2017

@n-patiphon any update?

yk-fujii mentioned this pull request on Mar 14, 2023

Release v.1.4.0 Closed

autowarefoundation/autoware_ai#953

10 tasks

amc-nu added 2 commits 7 years ago

`Update ground_filter.launch` ··· `e0b4af1`

`Update ground_filter.launch` `4dcc07b`

amc-nu commented on Aug 3, 2017 Member

@dejanpan @yk-fujii
Can you merge latest develop branch onto this one?
I just added new params to the launch file, would you like to add something else before merging?

`Merge branch 'develop' into feature/lidar_filter` `3b59445`

dejanpan commented on Aug 3, 2017

Merged. This is still missing:

a)generates a pdf from https://drive.google.com/file/d/0B8iMqYxCmvZAZGRVOUhVQmhsSVE/view?usp=sharing
b) upload it https://github.com/CPFL/Autoware-Manuals/tree/master/en
c) Add the following block here: https://github.com/CPFL/Autoware/blob/046b973dae7e21b1cfa73f772fade9557e5b1157/ros/src/sensing/filters/packages/points_preprocessor/nodes/ground_filter/ground_filter.cpp#L5

```
/**
 * @brief Below algorithm is documented here
<link to pdf>.
 */
```

d) create issue for the functional bug as reported in this comment: #655 (comment).

I can do all of it if you want.

amc-nu commented on Aug 3, 2017 Member

@dejanpan if you could do it, it would be a great help. Thanks.

 `link to documentation` `f0027fd`

 **dejanpan** mentioned this pull request on Mar 14, 2023

Ring Ground filter wrong segmentation Closed
autowarefoundation/autoware_ai#957

dejanpan approved these changes on Aug 4, 2017 View reviewed changes

dejanpan left a comment

Done it all. As soon as I get access to Autoware-Manuals I will also upload the pdf.

yk-fujii merged commit `090db74` into `develop` on Aug 4, 2017

---

yk-fujii mentioned this pull request on Aug 4, 2017

Release/1.4.0 #762 Merged

This was referenced on Mar 14, 2023

[Feature] Add ground_filter config Closed
autowarefoundation/autoware_ai#989

Add ground_filter config for runtime_manager #828 Merged

amc-nu changed the title ~~Added new Ground Filter~~ **Added new Ground Filter (Ring based)** on Nov 20, 2017

kargarisaac commented on Oct 29, 2018 • edited

@amc-nu @dejanpan
There are two filters for ground/no-ground segmentation in autoware, right? Is there any data set with annotation and labels to measure their performance? Which one is better? What is advantages and disadvantages of each one?

👍 1

gbiggs unassigned **dejanpan** on Mar 24, 2019

mitsudome-r added the version:autoware-ai label on Jun 14, 2022