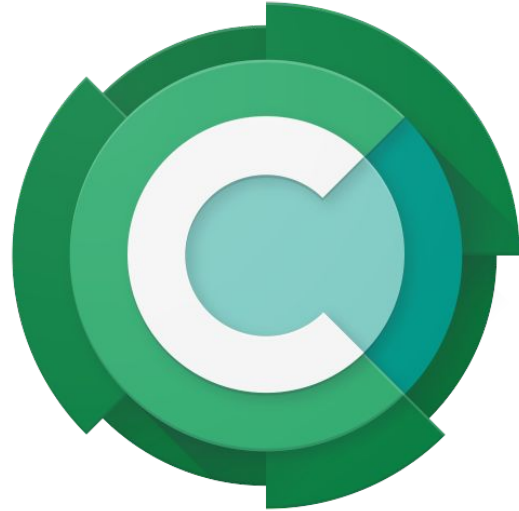


Cartographer Open House

June 22, 2017



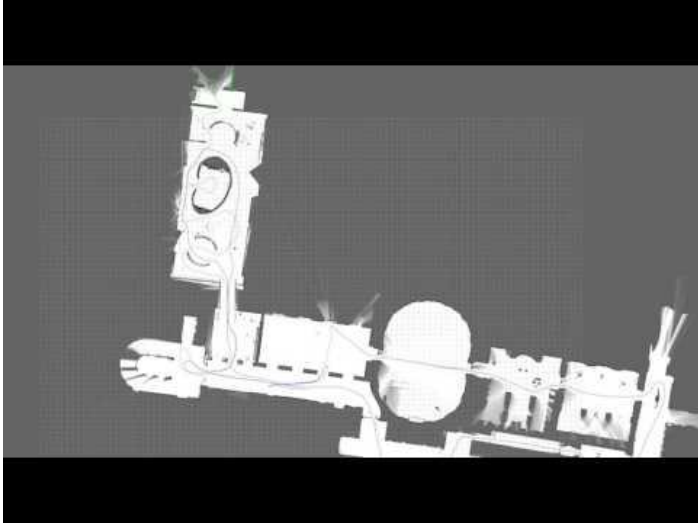
What landed on master? • cartographer

- Unstable 0.2 release ([#344](#))
- ~20 PRs around Submap trimming ([#283](#)) & pure localization ([#315](#))
 - code much cleaner now
- New points processor inserting points into a HybridGrid ([#323](#))
- Progress around reliable integration and quality testing ([#340](#), [#349](#))
- Bug fix for building on Zesty ([#385](#))

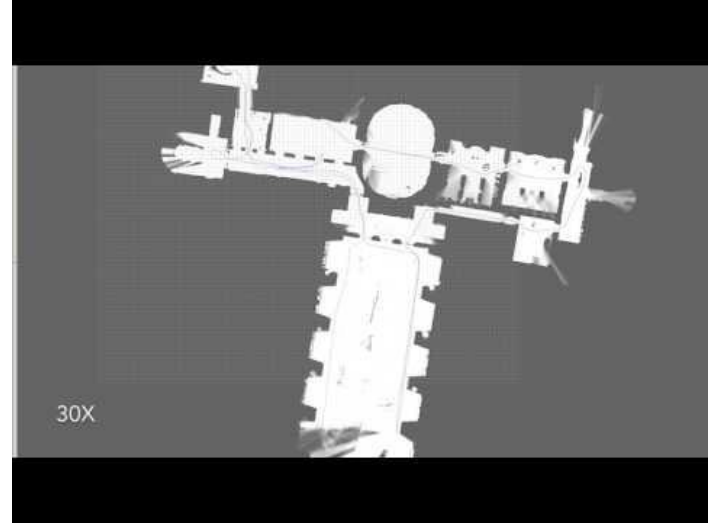
What landed on master? • `cartographer_ros`

- Serialization of pose graph instead of just Trajectory ([#365](#))
- Fix trajectory rendering crash ([#367](#)) and nice colors ([#363](#))
- A command line tool to start a new trajectory conveniently from an existing lua file ([#390](#))

Demo • Multi Trajectory & Pure Localization



[Multi Trajectory](#)



[Pure localization](#)

Multi trajectory not very performant: [#329](#)

Demo • Ground Truth evaluation

```
$ roslaunch cartographer_ros offline_backpack_2d.launch bag_filenames:=cartographer_paper_deutsches_museum.bag
```

```
$ ./cartographer_autogenerate_ground_truth -pose_graph_filename cartographer_paper_deutsches_museum.bag.pb  
-output_filename cartographer_paper_deutsches_museum.relations.pb
```

```
[...] Reading pose graph from '/usr/local/google/home/whess/bags/cartographer_paper_deutsches_museum.bag.pb' ...  
[...] Autogenerating ground truth relations...  
[...] Generated 4987 relations and ignored 80 outliers.  
[...] Writing 4987 relations to '/usr/local/google/home/whess/bags/cartographer_paper_deutsches_museum.relations.pb'.
```

```
$ ./cartographer_compute_relations_metrics -relations_filename -relations_filename  
cartographer_paper_deutsches_museum.relations.pb -pose_graph_filename cartographer_paper_deutsches_museum.bag.pb
```

```
[...]  
Abs translational error 0.01944 +/- 0.01819 m  
Sqr translational error 0.00071 +/- 0.00189 m^2  
Abs rotational error 0.11197 +/- 0.12432 deg  
Sqr rotational error 0.02799 +/- 0.07604 deg^2
```

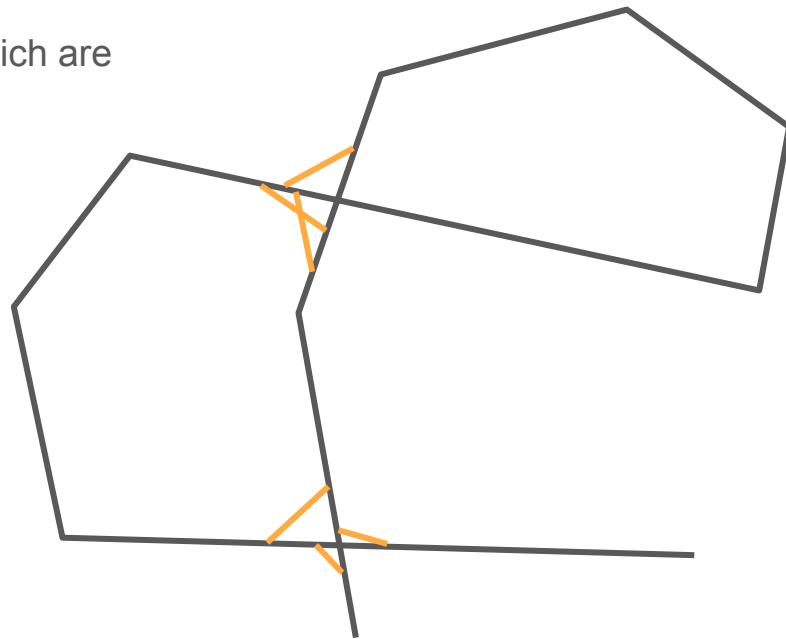
Demo • Ground Truth evaluation

Idea:

- Solution (gray line) is locally correct (small error)
- Use constraints as ground truth (yellow lines) which are
 - Separated by large covered distance
 - Inliers (i.e. almost satisfied)

Use cases for auto-generated ground truth:

- Smoke test, [#239](#)
- Non-loop-closed quality assessment



Current work

- Serialization of in-memory state ([#253](#))
- Submap deletion ([#283](#)), nearly done
- Constraints visualization? Status?
- Landmarks ([#244](#)). Magazino?

Placeholder for other status reports

Help wanted!

Thanks!

Next Open House:
July 6, 5pm CEST (8am PST)

If you would like to present anything next meeting, please reach out to
hrapp@google.com