

Yabloc Localization - Test Results #3639

StepTurtle started this conversation in Show and tell



StepTurtle on Jul 6, 2023

Collaborator

edited ▾

This report includes the test results of the Yabloc localization software (developed by [@KYabuuchi](#)) that has recently been merged into Autoware.

During the tests repository in [this link](#) has been tested, Autoware implementation not used.

Our test car has includes these sensors:

Sensor	Model
Camera	Lucid Vision Triton 5.4 MP 70°
GNSS/INS	SBG Ellipse-D (with RTK)
Lidar	Velodyne Alpha Prime (Yabloc not uses)

Category



Show and tell

Labels

component:localiza...

3 participants



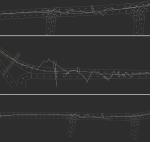
Tests

- The yellow trajectory displayed on the Rviz screen represents the localization result, while the white trajectory represents the GNSS.
- All of the test data has been collected from a university campus, therefore it mainly consists of single-lane roads. There is no highway driving test included in the tests.
- Default parameters of Yabloc have been used during the tests.

During the videos, it can be observed that there is some errors between the algorithm's performance and GNSS route in certain areas where the algorithm works well. This discrepancy is not a localization error but rather an error originating from the GNSS used.

Test ID	Description	Image	Link	Outcome
1	<p>This is the test with the longest driving route among the tests (avg. 10 minute). This test was conducted to observe its</p>		Link	<p>The algorithm has provided good results for a significant portion of the test, but there are significant localization errors</p>

Test ID	Description	Image	Link	Outcome
	<p>behavior during long autonomous drives.</p> <p>The road along the route includes rough and damaged sections, areas with increased GNSS errors, and uphill roads.</p>			<p>in some areas. It can be observed that in some locations with significant localization errors, the algorithm is able to relocalize correctly again.</p>
2	<p>This test has ideal testing conditions. GNSS errors are significantly low, and the road lines are well-defined.</p>		Link	<p>In this test conducted under ideal conditions, the algorithm has provided highly successful results. No errors have been observed.</p>
3	<p>During this test, the road lines are faded and damaged for a significant portion of the road.</p>		Link	<p>It has been observed that the algorithm struggles to detect many lanes in areas where lane markings are damaged or faded, but there is not a significant decrease in performance.</p>
4	<p>This test route consists of predominantly uphill roads (slopes). It was conducted to observe how the algorithm performs on uphill roads.</p>		Link	<p>The test results indicate that the localization performance is significantly lower on uphill roads (slopes).</p>

Test ID	Description	Image	Link	Outcome
5	The results of this test have been examined under conditions where there are high GNSS errors. The vehicle is surrounded by trees throughout the road, and the GNSS errors are above average.		Link	It can be seen that the algorithm does not make errors and produces accurate localization results in areas where GNSS errors are high.

The tests conducted have shown that the Yabloc algorithm has generally yielded successful results:

- It serves as a great alternative in areas with high GNSS errors during autonomous driving.
- There are high errors on uphill roads. If the errors are due to any oversight or omission on our part, we are open to suggestions.
- It is observed that the lane detection method does not work well under certain conditions, especially on damaged roads and areas where lane markings are faded. Additionally, the performance is also compromised when vehicles obstruct the lane ahead. It can be discussed how different lane detection algorithms would yield results.

At this stage, data collection and tests are being conducted only with rosbags. However, we are planning to perform autonomous driving tests with Yabloc and comparison tests with NDT. I would be glad if you could share any suggestions for the upcoming tests.

Furthermore, we would like to express our gratitude to [@KYabuuchi](#) for his excellent work. We extend our thanks once again.

↑ 2 ❤ 8

1 comment · 6 replies

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 KYabuuchi on Jul 6, 2023 Collaborator

Thank you for sharing the test results of YabLoc. 🙌
I wish you success in your future tests. Feel free to reach out to me if you encounter any issues. 👍

↑ 1 ❤ 1

6 replies

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KYabuuchi on Jul 7, 2023 Collaborator

If the question becomes complicated, it would be better to create a new issue. I will assist you in resolving it on the issue page.



StepTurtle on Jul 7, 2023 Collaborator Author

I think it's not very complicated, but I'm going to create issue.

1



StepTurtle on Jul 7, 2023 Collaborator Author

Here is the issue:

<https://github.com/orgs/autowarefoundation/discussions/3645>



kedarnadh-123 on Sep 22, 2023

I Need code for single lane car distance detection for my project....
our title is - Automatic breaking & collision avoidance



KYabuuchi on Sep 22, 2023 Collaborator

@kedarnadh-123 With the right map, YabLoc can estimate self-position even in single lanes.

If you want to measure the distance to obstacles, you may be able to use Autoware's perception feature.

Please ask about that in another discussion. YabLoc does not measure distance to obstacles.