

[Proposal] New Calibration Method using Neural Networks #4663

CristianGariboldi started this conversation in **Show and tell**



CristianGariboldi on Apr 24

Hello, I am here to propose a new calibration method for the longitudinal dynamics which is easier to use than the default one that autoware provides. You can find my repository at the following link:

https://github.com/pixmoving-moveit/learning_based_vehicle_calibration/tree/normal_vehicle

The advantages of this new calibration method are diverse:

1. real data are interpolated with a neural network, which is able to provide a very accurate and smooth map, and can capture the non-linearities of the system;
2. the whole calibration process is very user-friendly, fast and efficient;
3. you don't need a huge amount of data for training the neural network, making the data collection process faster;
4. the learning-based approach can be easily adapted to different kind of scenarios, and not solely on the longitudinal dynamic. In my repository for example, I also included the calibration for steering/parking scenarios, just by adding 1 input to the network;
5. It can be used with a diverse range of vehicles, with different dynamics, kinematics, engines and transmission systems;
6. It has been tested in simulation and with real vehicles. We now use it for calibrating our vehicles in Pix Moving.

I also share here some slides with a quick explanation of the systems design, the results and a short "How to use" tutorial.

[Calibration.pptx](#)

I also wrote a technical report here:

[Pix_Longitudinal_Calibration.pdf](#)

I know a direct comparison between this calibration method and the autoware's default one would be helpful to highlight the differences of performances and could be interesting as well.

Any feedback, comment or direction would be much appreciated. I would be happy to further discuss this method for a possible integration in the autoware universe.

Category



Show and tell

Labels

component:control

2 participants



2 comments · 2 replies

Oldest

Newest

Top



maxime-clem on Apr 24

Collaborator

Thank you for your contribution. This looks really interesting and I will try to have a deeper look when I find the time.

In case you are available later today, do you want to join the Planning & Control working group (https://calendar.google.com/calendar/u/0/embed?src=autoware.org_6lol0ho5ft0217h8c60pi1fm30@group.calendar.google.com) to present your work ?

↑ 1

2 replies



CristianGariboldi on Apr 25

Author

Thanks Maxime for the feedback and the invitation to the meeting. I'd be happy to join and do a short presentation. Since I am in China the time zone is not clear to me though, does it start at 4pm, Beijing time?



maxime-clem on Apr 25

Collaborator

Great ! 4pm Beijing time is correct.

Just in case, here is the zoom link:

<https://us02web.zoom.us/j/82394890033?pwd=aXo3YUhKWlJMZEN0RHJKaGF3bjdpZz09>

👍 1



CristianGariboldi on Apr 26

Author

Hello **@maxime-clem** , FYI I've just sent the PR. Since it's my first one, I hope everything is fine and in line with the guidelines. Feel free to reach out for anything, will be glad to help!

↑ 1

0 replies