2024-06-17 ODD working group weekly meeting (193) #4877

Igata-ctrl started this conversation in **Working group meetings**

Igata-ctrl on Jun 17 Collaborator edited

Attendee

- [Turkey is in national holiday week.]
- David Walmroth (PIX Moving)
- @mitsudome-r Ryohsuke MITSUDOME (AWF TSC/TIER IV)
- @Igata-ctrl Hiroshi IGATA (TIER IV)

Agenda/Minutes

- On May 19, 2024, No simulation result was obtained due to SimulationError:AutowareError.
  - Message : Simulator waited for the Autoware state to transition to WaitingForRoute, but time is up. The current Autoware state is EMERGENCY.
  - The term "Emergency" hints that this error is associated with the Autonomous Emergency Braking (AEB) module of Autoware.
- On May 26, 2024, No simulation result was obtained due to SimulationError:AutowareError though the build was successful.
  - Following messages and the information are the same as last week.
  - Message : Simulator waited for the Autoware state to transition to WaitingForRoute, but time is up. The current Autoware state is EMERGENCY.
  - The term "Emergency" hints that this error is associated with the Autonomous Emergency Braking (AEB) module of Autoware.
  - This error is happening only when Autoware is built with/for Scenario Simulator v2.
- On May 27, 2024, 552/617 regular and prototype scenarios succeeded. This simulation was conducted with the build(binary) from a different branch where the default speed limit was modified to 40kph from 15kph by @mitsudome-r.
  - 126/141 **public road bus** scenarios were successful.
  - 207/220 **pull over** scenarios were successful.
  - 183/198 **pull out** scenarios were successful.

Category
Working group meetings

Labels
meeting:odd-wg

1 participant

    - 23/58 **prototype** scenarios including low speed ODD were successful. Some of the use cases/scenarios in this suite have not beed addressed by Autoware.universe yet.

- On June 2, 2024, 442/617 regular and prototype scenarios succeeded.
    - 127/141 **public road bus** scenarios were successful.
    - 118/220 **pull over** scenarios were successful.
    - 183/198 **pull out** scenarios were successful.
    - 14/58 **prototype** scenarios including low speed ODD were successful. Some of the use cases/scenarios in this suite have not beed addressed by Autoware.universe yet.
    - The overall result this week was very similar to the May 13, 2024 result.

- On June 9, 2024, 460/641 regular and prototype scenarios succeeded.
    - 127/141 **public road bus** scenarios were successful.
    - 119/220 **pull over** scenarios were successful.
    - 187/198 **pull out** scenarios were successful.
    - 27/82 **prototype** scenarios including low speed ODD were successful. Berkay kindly added 24 scenarios/cases.

- On June 16, 2024, 446/642 regular and prototype scenarios succeeded.
    - 126/141 **public road bus** scenarios were successful.
    - 103/220 **pull over** scenarios were successful.
    - 185/198 **pull out** scenarios were successful.
    - 18/83 **prototype** scenarios including low speed ODD were successful. Berkay kindly another scenario.
    - The overall result this week was similar to the May 13, 2024 result.

- Comments have been added to Leo Drive Scenario Catalog v0.7 - DRAFT.

- Answers to some of the questions from the meeting last week.
    - Comfortable braking threshold (deceleration and jerk) -> See the updated vehicle performance page.
    - Cloud quota for the weekly simulation -> The monthly total DURATION should not exceed 50 hours. You can check it in the Evaluator screen. -> **@lgata-ctrl** to double check that it is OK to simply add up the time in the DURATION column in the Evaluator Reports page.

- A TUM researcher Aniket Salvi, M. Sc. will be joining next week to introduce his approach to ODD.

> Aniket Salvi, M. Sc.
> Research Engineer
> Engineering of Software-Defined Mobility
> Fraunhofer-Institut für Kognitive Systeme IKS

[recap of the discussions until last week]

- **@Igata-ctrl** joined the Reference Design WG meeting on May 29, 2024 and learned about the low speed ODDs of ROBEFF Technology's cargo vehicle and Kingwaytek's shuttle bus. -> Try to take some time to comment on this use case spreadsheet.

- Also discussed the followings:

  - Comfortable braking threshold (deceleration and jerk)
  - Cloud quota for the weekly simulation (TBC)
  - Expect **@mitsudome-r** to streamline the registration process to the Evaluator
  - Is there an easy way to download multiple scenarios at once? -> Unfortunately, no, as each scenario is associated to certain map and its version.

- Recap of the discussion items with Safety Pool.

  - [Map] We can convert OpenDRIVE Map to Lanelet2, but have following issues. Though Mohammad (Deepen.ai/AWF Safety Assurance WG lead) proposed in May TSC that Autoware should accept OpenDRIVE maps in a direct fashion as it solves all these issues, while we cn also solve these by post processing after conversion.
    - Speed limit, lane change flag and LHT/RHT are lost through conversion.
    - The converted Lanelet2 map contains a lot of unnecessary points on line strings.
  - [Scenario] Autoware requires the EGO's destination to work, while Safety Pool scenarios do not restrict the Ego vehicle (SUT) nor define destination. We need to consider some “roaming” mode for Autoware to operate without the destination. Also, some autonomous driving scenarios do require EGO destination to represent certain use cases.
  - [Scenario file format] Though both Safety Pool and Autoware (Scenario Simulator v2) use OpenSCENARIO v1.x (a.k.a. OpenSCENARIO XML) standard, Autoware (Scenario Simulator v2) uses ”.yaml” file to better handle parameters, while Safety Pool uses “.xosc” file, which is the default of the OpenSCENRIO standard. If the number of scenarios are not too many, or the on-premise simulation set up is used.
  - [Scenario availability] After signing up for the Safety Pool database, the number of the accessible scenarios are quite limited (651 as opposed to one million). Safety Pool is kindly looking into it.

- Found an interesting urban mixed traffic example "iino" in Japan, which uses Autoware. Reaching out to this company if they can attend AWF ODD WG to share their experience.

  - News of its demonstration experiment in a congested commercial avenue in Japan.
  - Developer web page (Gekidan Iino).

    - Additional information from the developer in Japanese. (It uses the infrastructure cameras to understand the flow of the people.)
    - Past article (2018) which states that it uses Autoware.

- Discussion over Urban-Area-Scenarios by Berkay (Leo Drive).

- Continued discussion of the Low Speed Vehicle ODD over the video of National Taiwan University campus.

- Brief discussion on the proposed agenda regarding the Add docs for guiding the developers on finding, diagnosing, and fixing scenarios in Autoware

- In the AWF TSC on May 14, Mohammad Musa (Safety Assurance WG/Deepen.ai) recommended to consider switching to OpenDRIVE as it is the default map format with AD simulation companies including Applied Intuition, Foretellix and Cognata along with OpenSCENARIO scenario format. May need to discuss it internally first, revisiting the discussion when Autoware chose Lanelet2.

- On April 30, **@Igata-ctrl** and **@mitsudome-r** joined the meeting with Safety Pool (Deepen.ai + WMG) and discussed that the following issues need to be addressed.

    - [Map] We can now convert OpenDRIVE maps of Safety Pool to Lanelet2 for Autoware using CommRoad Scenario Designer, but the following issues need to be ironed out. One option is to make Autoware accept OpenDRIVE maps instead of Lanelet2.
        - Following information is lost through the conversion.
            - Speed limit, lane change tag, LHT/RHT, etc.
        - The converted Lanelet2 map contains too many unnecessary points.
    - [File format] Safety Pool uses .xosc for OpenSCENARIO files, while Autoware Scenario Simulator v2 on Evaluator (cloud integrated CI/CD pipeline) uses .yaml file.
    - [Autoware] Autoware requires the EGO destination to operate, while no EGO destination is specified in Safety Pool scenarios. May need to consider a sort of roaming mode.
    - [Simulation Tool] Safety Pool uses esmini simulator (OpenSCENARIO player). Safety Pool is kindly sending us the link of the recording of a recent Webinar covering this.
    - [Access] After registering to Safety Pool, **@Igata-ctrl** can access the limited number (651 out of one million) of scenarios in Safety Pool database. Safety Pool is kindly looking into this issue.

- **@Igata-ctrl** prototyped three dense urban scenarios based on the use cases. May need to clarify a few small issues with TIER IV CI/CD team.

- Daniel Shih, the lead of Reference Design WG joined to discuss the low speed (controlled area) ODD. Once it's finalized, it will be merged to the ODD definitions spread sheet.

- **@Igata-ctrl** shared a tip how to set arbitrary trajectory for NPCs with **@Berkay54** on Discord.

- **@Igata-ctrl** found an example scenario which uses the FollowTrajectoryAction. It seems there are some caveats around the initial settings of NPCs.

- **@Igata-ctrl** created a couple of example breadboard use cases for the dense urban ODD.

- **@Igata-ctrl** is continuing communication with Safety Pool. Currently, Map conversion and compatibility issues are discussed. A meeting has been set on April 30 to discuss how many scenarios will be available for Autoware and how.

- As for the "too many points" issue with the converted Lanelet2 map, I learned from TIER IV FMS & map team that this tool maybe helpful to reduce the number of the unnecessary points.

- Due to a recent bug fix of the scenario simulator v2 regarding the maximum speed setting, it turned out some of the scenarios need to be modified. Berkay who ported the basic TIER IV scenarios to AWF is kindly working on the fix now.

- As for the dense urban traffic ODD which Autoware Labs is going to work on, here's the link to the video of typical dense urban traffic which Fatih showed in the TSC. This would be a good start point for the new use case/scenarios.

- **@Igata-ctrl** has created a step-by-step memo "Map conversion using CommonRoad Scenario Designer (OpenDRIVE-_Lanelet2)-110324-055327" with a help from Ata (Leo Drive) who is familiar with the CommonRoad Scenario Designer also the author of the documentation. A example of converted Lanelet2 map is uploaded to the folder. The sample map has been uploaded to to the Evaluator (CI/CD pipeline) and an example scenario was created on it. Known map issues which require modification are as follows.

    - Linestrings contain too many points (16,000 points in the area map) -> Vector Map Builder response is very slow
    - Max speed was set to 10 kph -> Modified to 100 kph
    - Line strings between lanes were set as "not-lane changeable" -> Set to "lane changeable"

- Regarding the scenario compatibility, Safety Pool scenarios are in .xosc file and Autoware/Evaluator (CI/CD pipeline) uses .yaml file for more flexible handling of the parameters. Though stand alone Scenario Simulator v2 can accept .xosc file, Evaluator cannot. We may perhaps need another converter or some modification of Evaluator side. **@Igata-ctrl** is inquiring Safety Pool approximately how many scenarios will be available for Autoware in order to identify what level of automation is desired here.

- [Stephen] Is there any way to obtain the ODD information from the suspended EV project of Apple's (Titan)?

- As a preparation for the Autoware Lab discussion, **@Igata-ctrl** would like to add "(RoboTaxi in) dense traffic area" to the ODD definitions table. Would like to further edit this table during the meeting.

- Safety Pool presented the outline of Safety Pool.

    - The presentation will be shared in the ODD WG Google Drive.
    - A very large scale (half to one million) scenario database and the eco system is already established.
    - Users can search for appropriate scenarios by tag searches and add scenarios to the database.
    - The scenarios of Safety Pool use OpenDRIVE map.
    - **@Igata-ctrl** shared the sample scenario and the Lanelet2 map with Safety Pool for analysis.
    - Asked Mohammad and Siddartha to join again next week to make a full demonstration of Safety Pool.

Action Item

- **@Igata-ctrl** to join Reference Working Group meeting on May 29 to discuss the low speed vehicle ODDs from robeff and Kingwaytek both in Taiwan.

Documents

- The bus ODD use case list which was assigned to the members is here.
- The bus ODD use case list has been also uploaded here to make it visible to anyone on the net.
- The ODD working group shared document folder is here. [Restored!]
- Discussions and Q&As in AWF Discord ODD WG channel are also encouraged.

Tools

- [Autoware Evaluator (CI/CD pipeline)]

    - Cloud based DevOps (integration of the development tools including the scenario editor and the scenario simulator below)
    - A product from TIER IV and offered for the official Autoware Foundation projects like Cargo Delivery and Public Road Bus, etc.
    - The user guide is available TIER IV document site
    - As it consumes AWS resource, the (batch) weekly execution of the scenario simulation is managed by the Software/ODD WG leads

- [Scenario Simulator V2 (Scenario testing framework)]

    - Stand alone scenario simulation tool

    - An OSS from TIER IV freely available for any Autoware developer/researcher
    - The documentation of the Scenario Testing Framework (open sourced from Tier IV) is on GitHub

- The GUI Scenario editor
    - Web based GUI scenario editor freely available from TIER IV
    - You can create and export scenarios with this web interface
    - The user guide is available TIER IV document site

- [TIER IV account]
    - The working group members who are interested in creating and testing scenarios are advised to create a free TIER IV account here.
    - Once you have created your account, please let **@lgata-ctrl** know the (long) User ID which appears on your login page. After **@lgata-ctrl** registered you to the AWF group in the Evaluator (CI/CD pipeline), you can go to AWF Autoware Evaluator page to see the simulation results, create/edit scenarios, etc.
    - If you already have a TIER IV account, your 4-digit User ID continues to work, so you do not need to register to TIER IV account again.

Administrative

- The two meetings on December 25th (Christmas day) and January 1st (New Year day) have been cancelled.
- Please check the ODD WG wiki page.
- Recurring weekly meetings have been scheduled. Please check Autoware Foundation events calendar and add this calendar to your own Google calendar by clicking the right bottom button and/or add your contact to ODD WG invitation group to receive invitations for future meetings.
- ODD WG meetings are held weekly in the following single time slot.
    - 7:00am, Monday (PST) / 6:00am, Monday (PDT) US Pacific Time
    - 10:00am, Monday (EST) / 9:00am, Monday (EDT) US Eastern Time
    - 4:00pm, Monday (CEST) / 3:00pm, Monday (CEDT) Poland time
    - 5:00pm, Monday (TRT) Turkey time
    - 10:00pm, Monday (CST) Taiwan time
    - 11:00pm, Monday (JST) Japan Time

↑ 1

0 comments