API for AWSIM #3330

✅ **Answered by mitsudome-r**   **Kim-mins** asked this question in **Q&A**

Kim-mins on Mar 12, 2023

Hi! I want to run Autoware with simulator, and I want to ask if there's any API to manipulate AWSIM, like python API of Carla.
I don't care about the language whether it is python or not, but I want to know if there's any tutorial for using API too.
Thank you in advance!

↑ 1

✅ Answered by **mitsudome-r** on Mar 14, 2023

As far as I know, there are limited API to manipulate AWSIM's simulation environment from external software.

The ones I know are:

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mitsudome-r on Mar 14, 2023   (Maintainer)

As far as I know, there are limited API to manipulate AWSIM's simulation environment from external software.

The ones I know are:

- ROS topics to control ego vehicle's movement:
  https://tier4.github.io/AWSIM/Components/ROS2/ROS2TopicList/
- Defining NPC pedestrians and NPC vehicles through .cs scripts:
  https://tier4.github.io/AWSIM/Components/Traffic/NPC/NPC%20Pedestrian/

I know that the developers of AWSIM are trying to support simulation with Open Scenario files so they might have some more APIs to be added in the future though.

@mackierx111 any comments?

✅ Marked as answer   ↑ 1   6 replies

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3 participants

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Kim-mins on Mar 15, 2023 `Author` edited ▾

I followed an installation instruction [here](#) to write C# script, and I tried to modify the file [RandomTrafficSimulator.cs](#), which seems like the script runs on Demo.

I tested **whether I can spawn a NPC Vehicle to the location relative to the ego vehicle(e.g., 10cm behind of the ego vehicle(maybe cm is not the correct scale in Unity))**, but I concluded myself that, it is impossible because I should provide a specific `lane` and a `waypoint` ([reference](#)), which cannot be retrieved from the ego vehicle itself.

I don't know about the `lane` and the `waypoint` well, but I thought that way since I cannot know which lane the ego vehicle is on.

Could you please tell me if my understanding is correct or not?

*Edit

I can spawn NPC vehicle to the specific point by changing position and forward of `NPCVehicleSpawnPoint` ([code here](#)), while `Lane` and `WaypointIndex` are unchanged, but NPC Vehicle does not move properly([video link](#)). Is this due to the improper `Lane` and `WaypointIndex` ?..

mackierx111 on Mar 24, 2023 `Collaborator`

[@Kim-mins](#)

Random traffic NPCs in AWSIM move along waypoints. It is possible to spawn npc behind the ego vehicle by editing the waypoint used for random traffic.

Also, if you want a scenario that random traffic cannot support, you will need to write it in C#. At that time, the NPC can be moved to any desired position by using the `SetPosition()` and `SetRotation()` methods. When doing own customized simulations, I find it more flexible and scalable to open UnityEditor and write C# rather than using an external API such as python.

We would like to support open scenarios in the future, but it will take some time.

Kim-mins on Mar 24, 2023 `Author`

[@mackierx111](#)

Thank you for the response!

Then I have one question. When I want to simulate Autoware on scenarios other than RandomTraffic, I should write the code in C# (open AWSIM project with Unity Editor) and build the project for each simulation. Is my understanding correct?

mackierx111 on Mar 27, 2023 `Collaborator`

@Kim-mins
Your understanding is probably correct. In the meantime, it is possible to run the simulation just by running UnityEditor without building it. (However, the performance load is high.)
Building is certainly a hassle, but in the case of many automated driving simulators users want to make their own customizations. It is better to have a full-scratch, custom premise than to have a subtle API available. If you have any complaints or suggestions for AWSIM class design, etc., we would love to hear them!

Kim-mins on Mar 28, 2023 Author

@mackierx111
Thank you! Now everything is clear to me! I really appreciate to your help!

Answer selected by **Kim-mins**