

POLY-VERIFICATION USER GUIDE

Welcome to PolyVerif

This user guide provides a detailed walkthrough for seamlessly conducting simulations with the Poly-Verification Suite utilizing the powerful PolyVerif framework. Before diving into the simulation process, make sure to refer to the comprehensive "InstallationGuide" for successful installation and configuration of the PolyVerif framework.

Configuration and Metric Defaults

Key configuration parameters are defined in the "config.ini" file, offering a glimpse into the default settings that govern the behaviour of the PolyVerif framework during simulations. These settings, ranging from detection thresholds to collision counts, play a vital role in the validation metrics that determine the success or failure of the simulation.

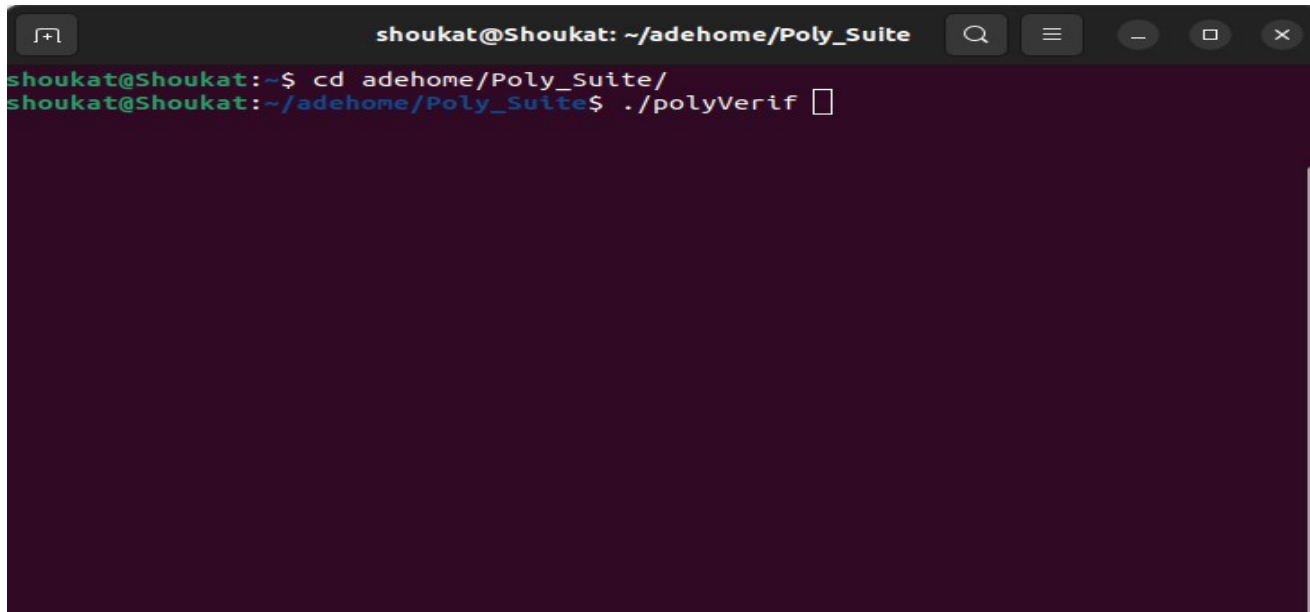
config.ini

```
[Autonomous_stack_config]
Detection_max_threshold = 40
Detection_min_threshold = 30
Control_collision_count = 0
Localize_max_threshold = 10
Localize_min_threshold = 02
Planner_goalpose_max_threshold = 10
Planner_goalpose_min_threshold = 02
```

Navigating the Simulation Landscape

1.Navigate to Poly_Suite Directory:

Go to the Poly_Suite directory located at adehome/Poly_Suite and execute the following commands:



```
shoukat@Shoukat: ~/adehome/Poly_Suite
shoukat@Shoukat:~$ cd adehome/Poly_Suite/
shoukat@Shoukat:~/adehome/Poly_Suite$ ./polyVerif
```

This command will initiate the PolyVerif framework for further configuration and execution

2.Select Validation Types for Detection

Four validation options await your exploration:

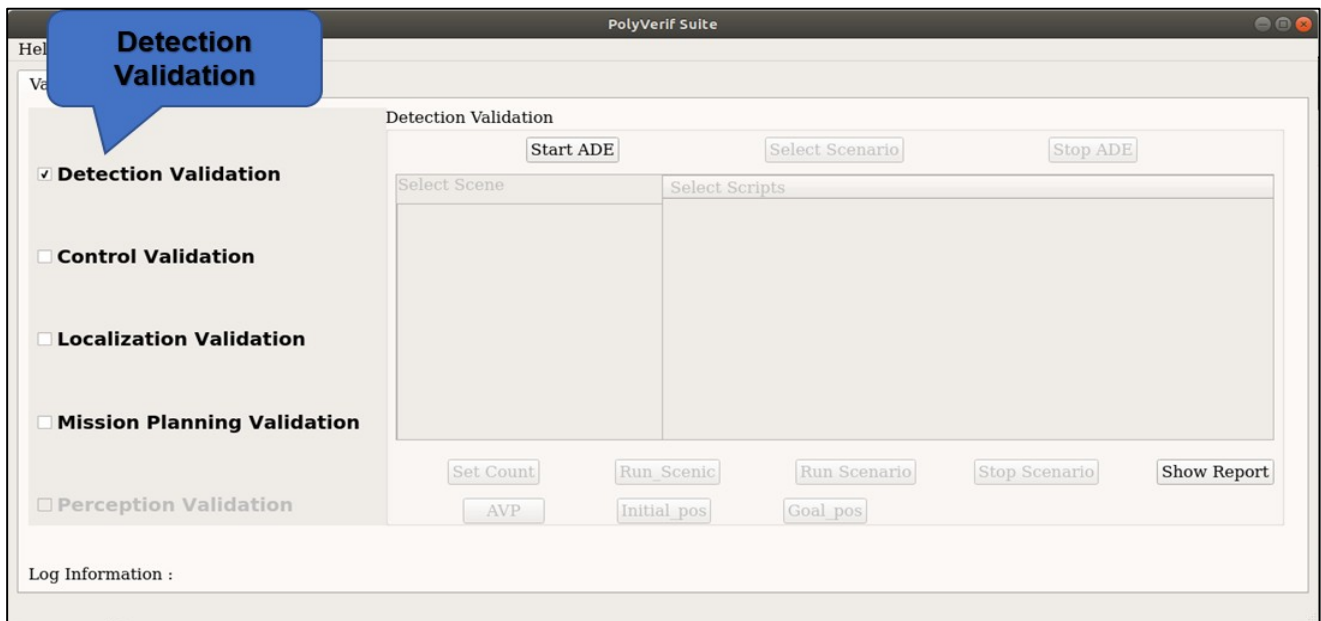
- Detection Validation
- Control Validation
- Localization Validation
- Mission Planning Validation



For the purpose of this guide, direct your focus towards Detection Validation.

Detection Validation:

Begin by clicking "Start ADE" to initialize modules, which includes Autware, the Perception Stack, AWSIM simulator, Rviz, and Ros2.



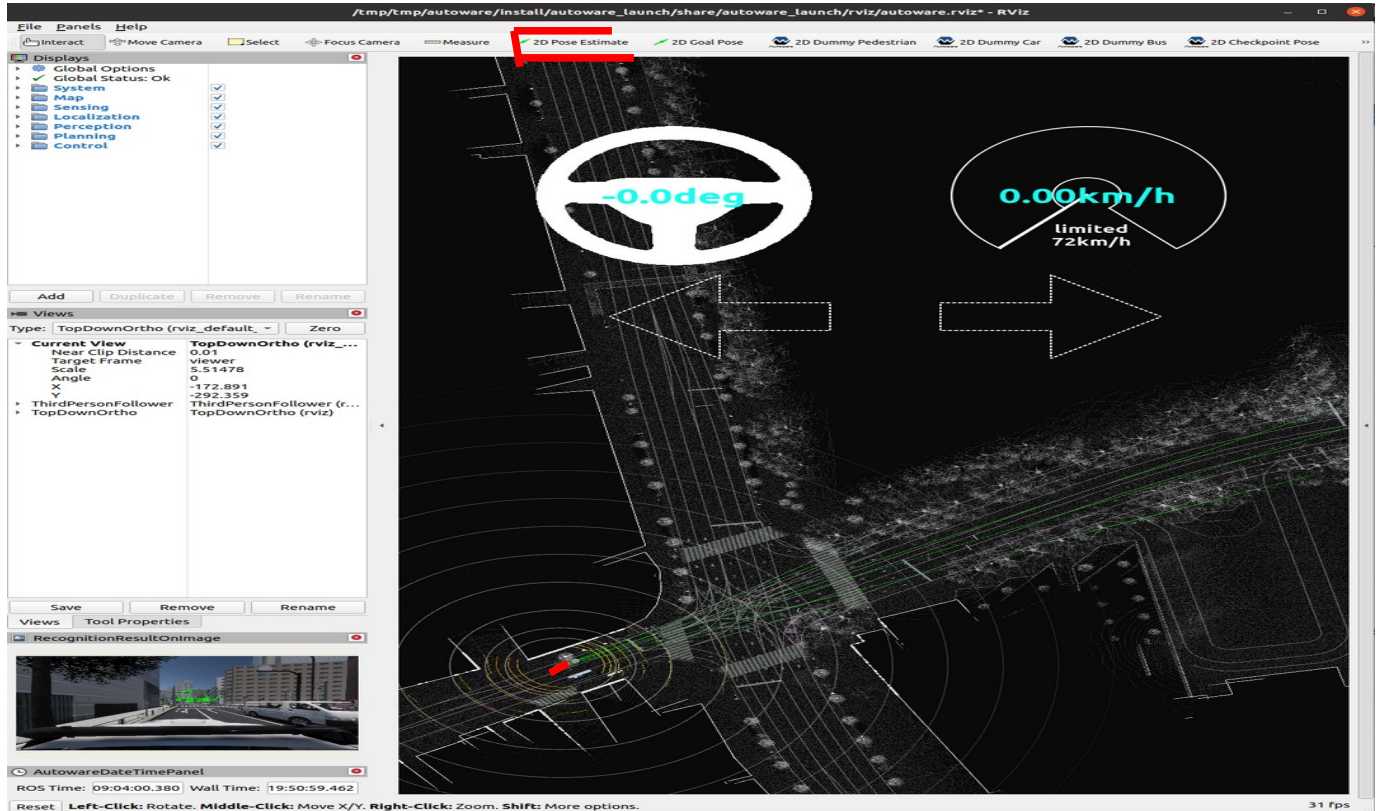
Allow some time for all necessary component get initialized in both simulator and rviz (map,ego,ego position,sensors etc).



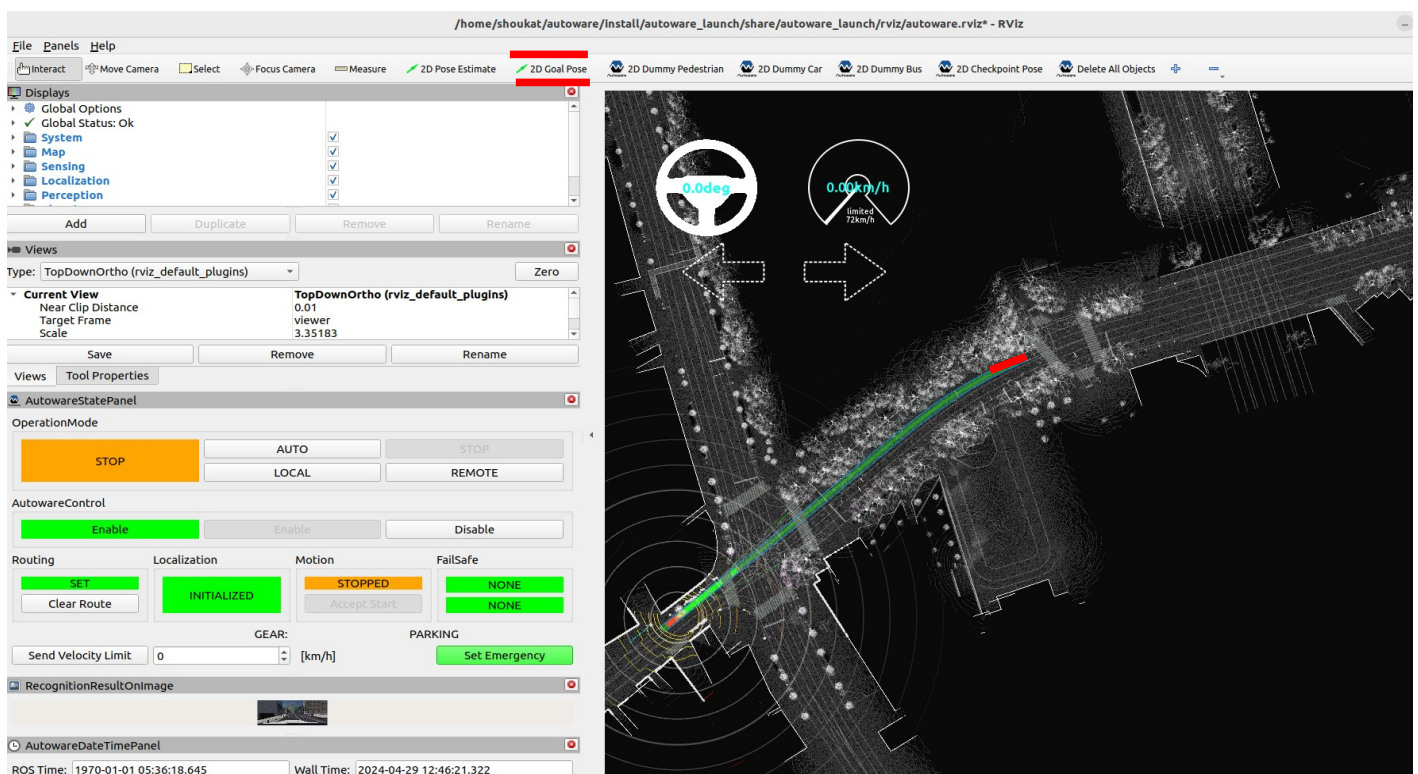
3.Set the initial and goal position

The Autoware will automatically set its pose estimation as presented below.

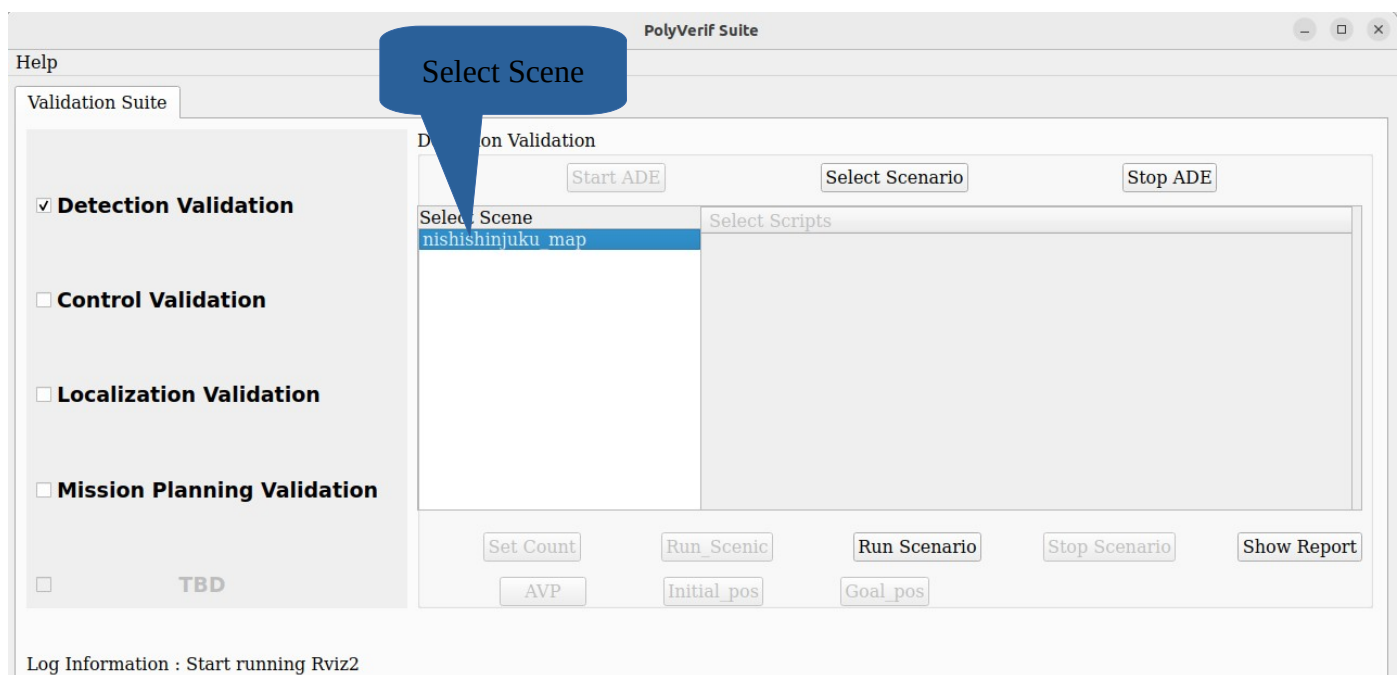
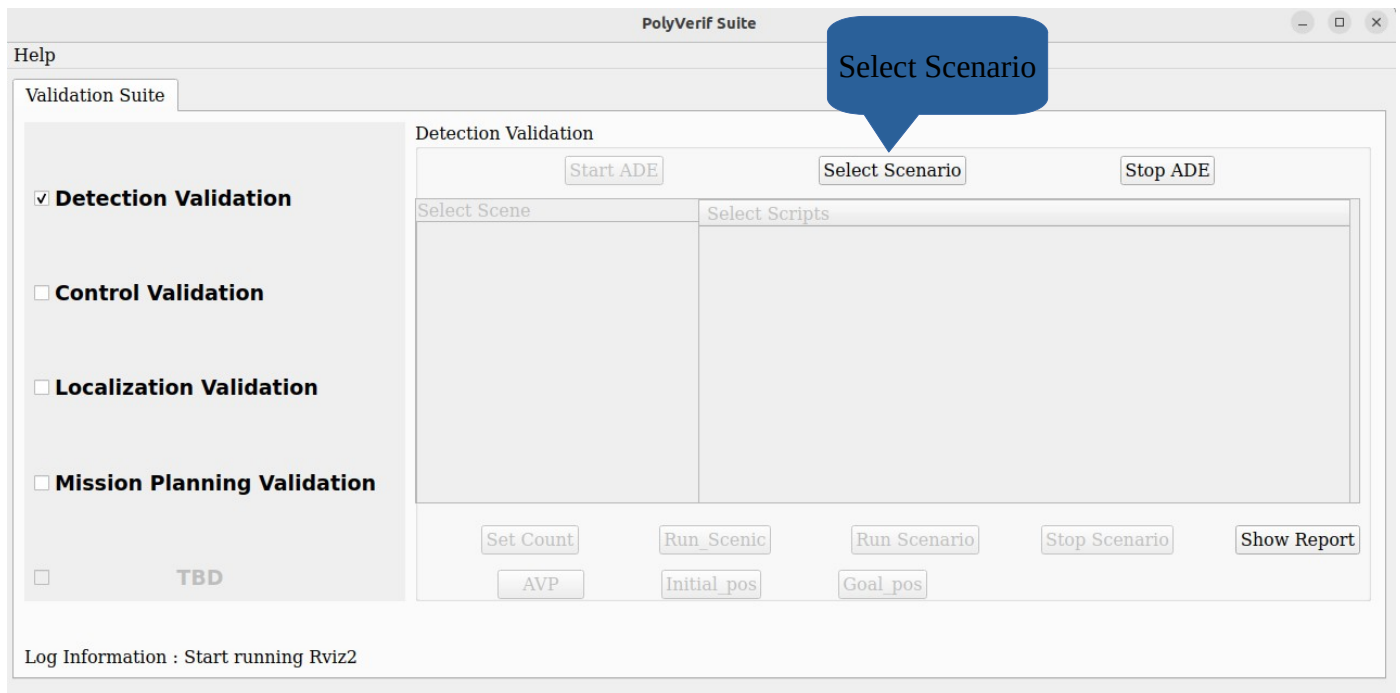
If the ego position not initializing properly then you can set ego position using 2D pose estimate button and drag arrow on map.



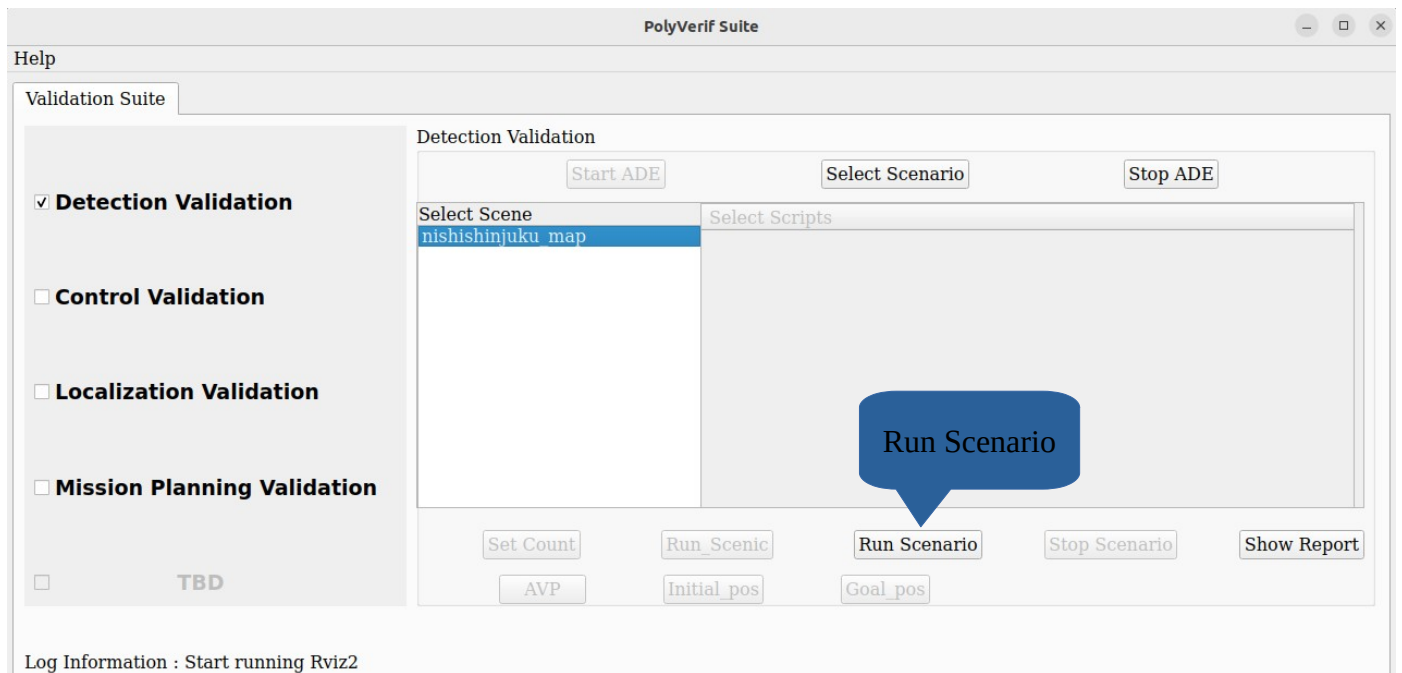
Set the navigation goal for the vehicle.



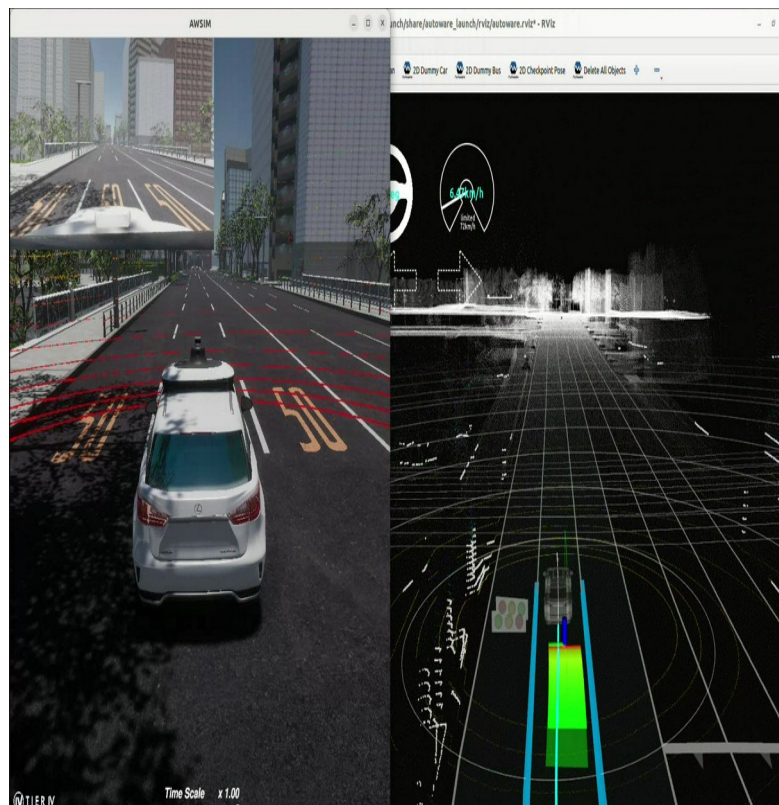
4. Select Scenario and Scene



5.Click on Run Scenario to Run Scenario:

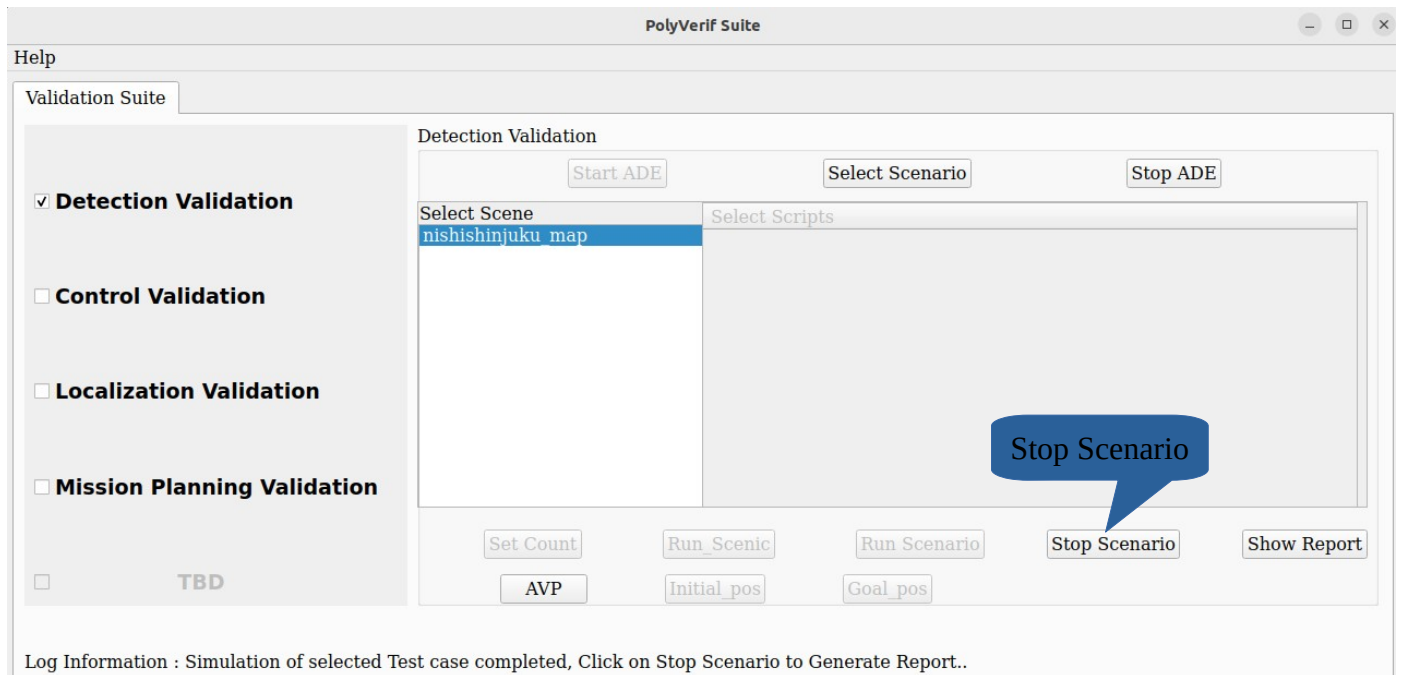


Let complete the scenario as shown below images

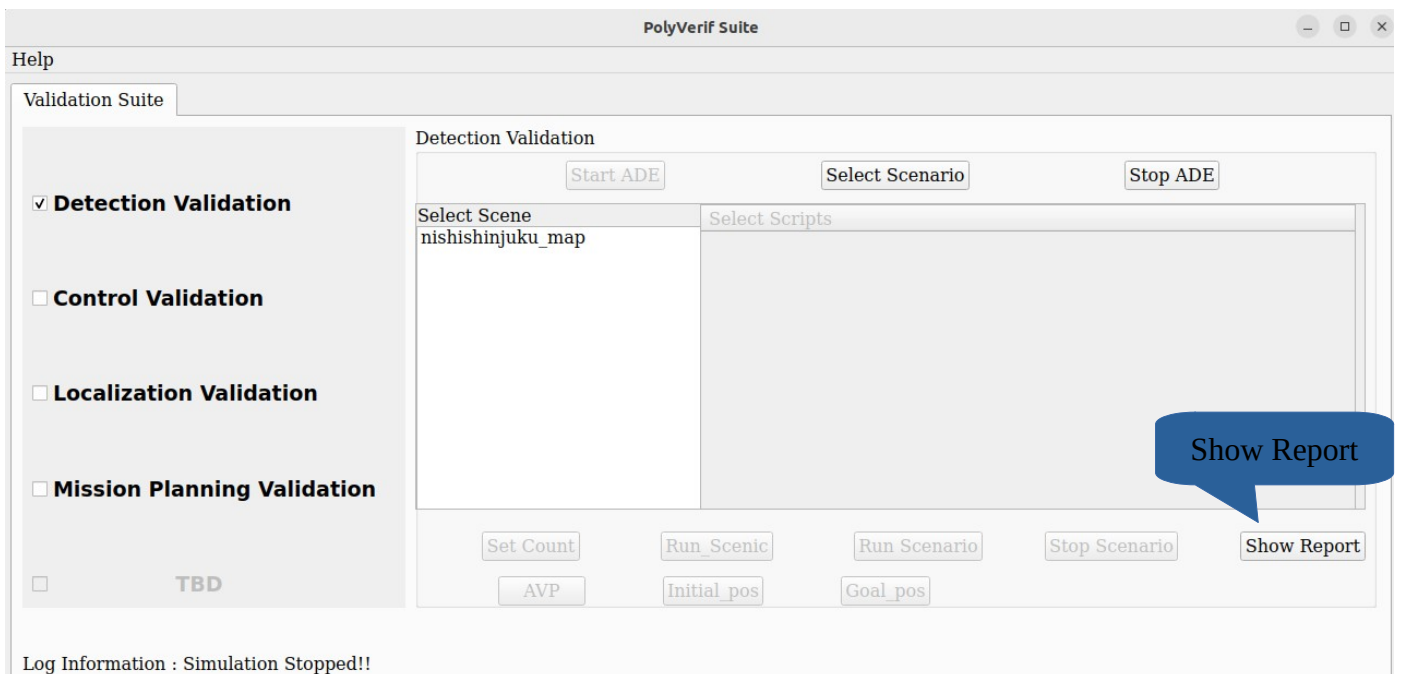


6.Simulation Management:

Utilize "Stop Scenario" to conclude the simulation.

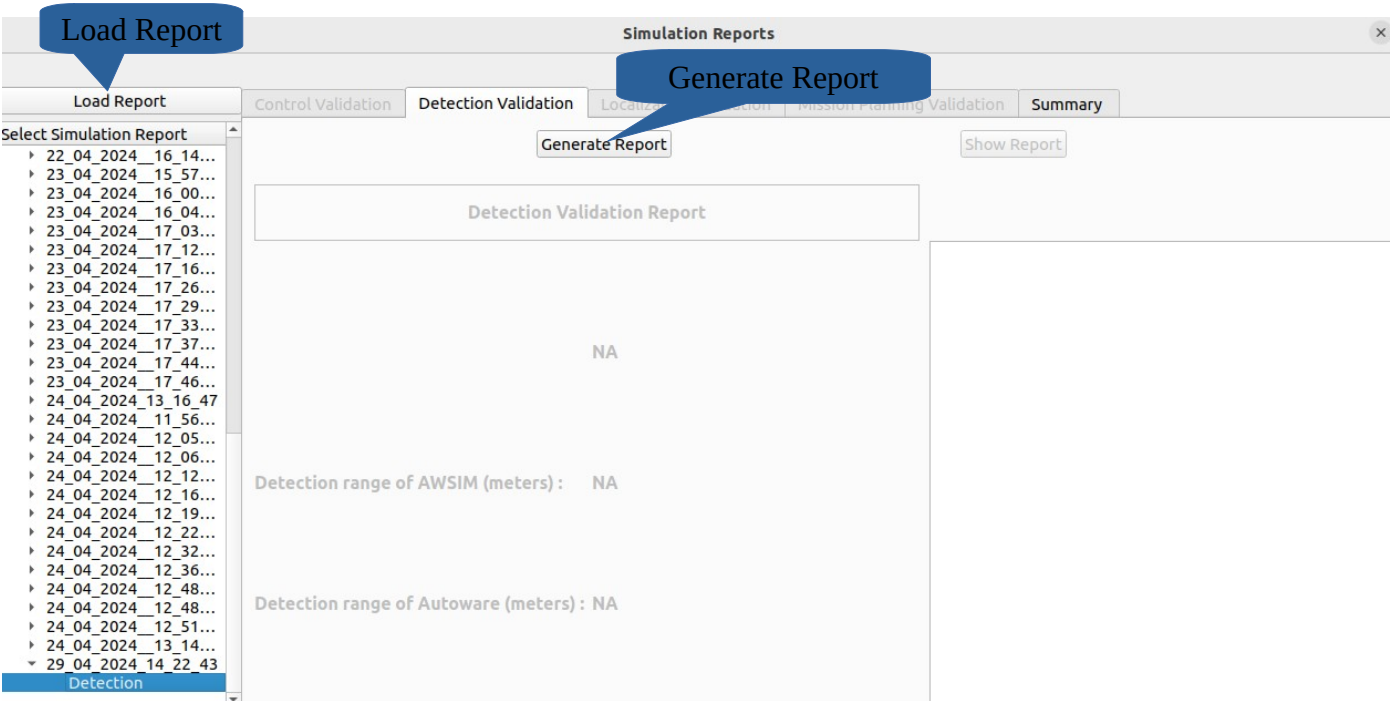


Access the detailed report through "Show Report."



7.Report Insights:

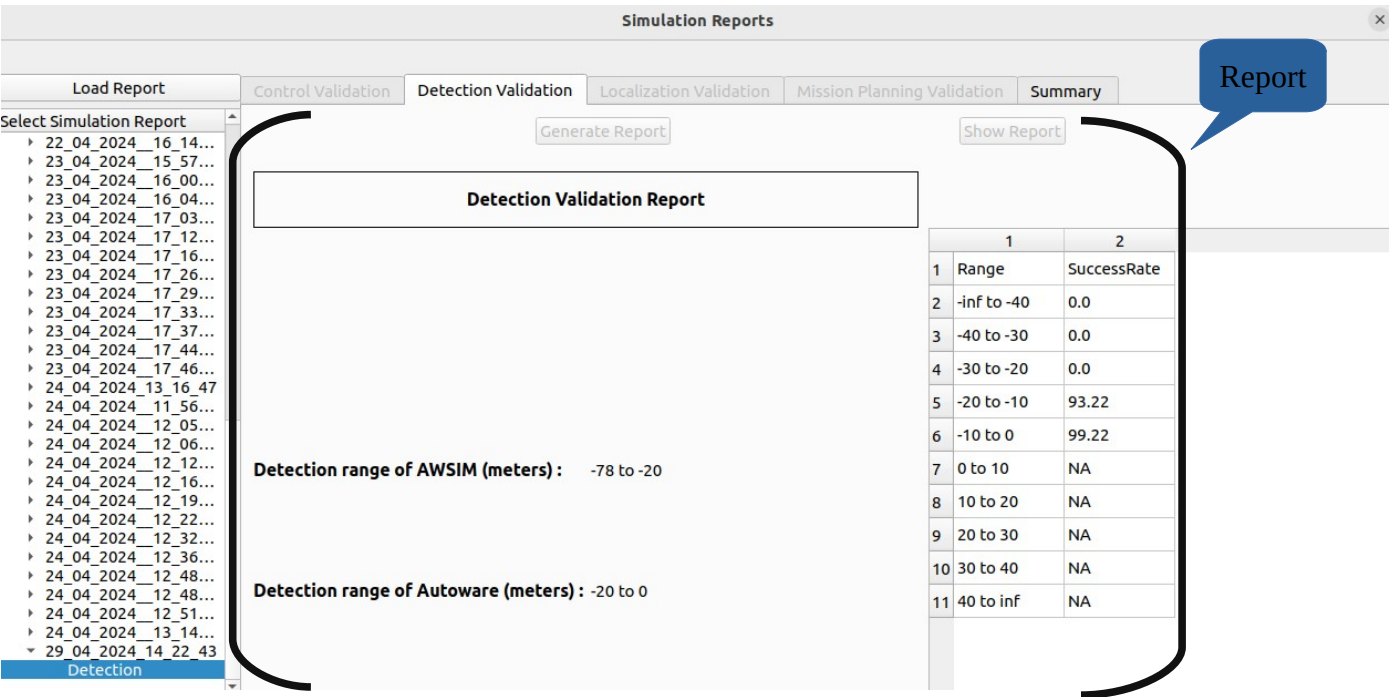
Explore simulation reports with the "Load Report" and "Generate Report" buttons.



Note: It will take 2-3min to generate report

8.Report Management:

Explore simulation reports.



Detection Success Rate of Autoware:

Refers to Autoware's accuracy in identifying objects. Evaluation involves comparing Autoware's detections with those from AWSIM.

Detection Range of AWSIM:

Defines the spatial area where AWSIM can identify objects. Autoware aims to match and detect objects within this specified AWSIM range.

Detection Range of Autoware:

Indicates Autoware's spatial area for object identification. Success is measured by Autoware's ability to detect objects within its specified range.

9.Stopping ADE:

After completing the scenario, click on "Stop ADE" to halt the PolyVerif framework and then close the terminal.

