

A Simulation Benchmark for Autonomous Racing with Large-Scale Human Data Rebuttal

1 Simulators

Figure 1 shows a comparison between different simulators, highlighting their respective strengths and weaknesses. **TORCS** (<https://sourceforge.net/projects/torcs/>) runs fast and is good for development, but it has poor physics and render quality. **Trackmania** (<https://github.com/trackmania-r1/tmrl>) also runs fast but has unrealistic physics. **CARLA** (<https://carla.org/>) runs fast but is primarily an urban cars simulator. **Learn to Race** (<https://github.com/learn-to-race/l2r>) offers good sensors support, but it suffers from poor physics and render quality, as well as limited tracks and cars. **Gran Turismo** (<https://www.gtplanet.net/gran-turismo-7/>) provides good render quality and acceptable physics, but it is not openly available and does not support custom tracks or cars and has restricted sensor support. **rFPro AVL VSM** (<https://rfpro.com/>) (<https://www.avlracetech.com/software/>) is considered one of the most realistic simulator on the market but comes with a very expensive license. **Assetto Corsa Gym** has good physics and render quality, but it has restricted sensor support which can be mitigated by creating ad hoc scripts that use information from the simulator (distance from the borders and opponents, or the 3d model of the track) with or without ROS2 interfaces.

Table 1: **Comparison of Simulators.** Key attributes of various driving simulators including TORCS, Trackmania, CARLA, Learn_to_Race, Gran Turismo, rFPro AVL VSM, and Assetto Corsa Gym (ours). Driver Experience Fidelity refers to the accuracy and immersion that replicate real-world driving experiences, such as the field of view, motion platform, and the realism of the pedals and steering wheel.

Attributes	TORCS	Trackmania	CARLA	Learn_to_Race	Gran Turismo	rFPro AVL VSM	Assetto Corsa Gym
Access	Open Source	Free	Open Source	Academic license	Not Available	Expensive License	One time purchase
Maintained	✗	✓	✓	✗	✓	✓	✓
Simulation speed	Fast	Fast	Fast	Real time	Real time	Real time	Real time
Physics	Poor	Very poor	Poor	Poor	Good	Professional grade	Excellent
Realistic tracks	Acceptable	Bad	Bad	Acceptable	Laser scanned	Laser scanned	Laser scanned
Cars	>20	1	1	1	>500	1	178
Tracks	>20	>25	1	3	37	>20	19
Custom tracks/cars	✓	✓	✓	✗	✗	✓	✓
Driver Experience Fidelity	Poor	Poor	Poor	Poor	Good	Professional grade	Excellent
ROS	✓	✗	✓	✗	✗	✗	✓
OpenAI Gym	✓	✓	✓	✓	✓	✗	✓