

FORMULA INFINITY

RACING GAME ENGINES ONLINE SEMINAR 1 Jan 20, 2020

Jean-François Chardon¹ & Petter Sjöstrand²

¹) Producer at Sector3 Studios - jean-francois.chardon@sector3studios.com

²) Freelance game developer and esports expert - p.w.sjostrand@gmail.com

Jean-François Chardon is the producer at Sector3 Studios, the creators of the racing simulator RaceRoom. He oversees the development of the RaceRoom game from idea to product. On January 20, he conducted an online seminar on racing game engines and the racing game industry.



SEMINAR REPORT

We started the seminar by talking about Racing Games and Racing Simulators. Jean-François made the point that there is a big distinction between these two. There is a ton of different racing games to play, where the emphasis lies in a fun gaming experience of varying type. On the other hand, there is only a handful of big racing simulators, and they have a quite monolithic community. This community consists of a quite small percentage of all gamers, but if you release a racing simulator, the community will test it out. Keeping a high retention rate is however critical. Once an racing player has invested (quite a lot) of money purchasing cars and tracks in that service and pays monthly, making that player jump to another simulator is quite difficult. Good press and positive opinions from Sim Racing influencers is critical.

RaceRoom, and racing simulators in general consists of two engines, a physics engine and a graphics engine. The physics engine calculates all the physical aspects connected to driving, such as downforce, engine power, steering, traction, etc. The graphics engine handles the graphical representation, based on information from the physics engine.

Jean-François proceeded to demonstrate how the game is fed data for each of the cars. RaceRoom collaborates with many different manufacturers and racing teams, who provide them with data for the game. This data is compiled in configuration files for each car. Things such as the engine, gearbox, wheels, fuel usage, mass and aerodynamics are all displayed in long lists and matrices of variables for each car. This information is then fed to the physics engine during racing.

Having in-depth data for race tracks is also very important for RaceRoom. Some tracks are laser-scanned down to the centimeter, to make driving through each curve and section as close to the real experience as possible. Each track contains different material data for different parts of the track, including edges and off-road dirt, to make the car behave naturally on every bit of the track.

The physics engines cover a great spectrum of aspects for racing, but as they are all built on simplified models of reality, there are always ways to exploit these models. Sector3 Studios continuously refine their engine as new exploits are found, and the game is tested by professional drivers to discover aspects where the racing simulator exhibits different behaviour than the real world.

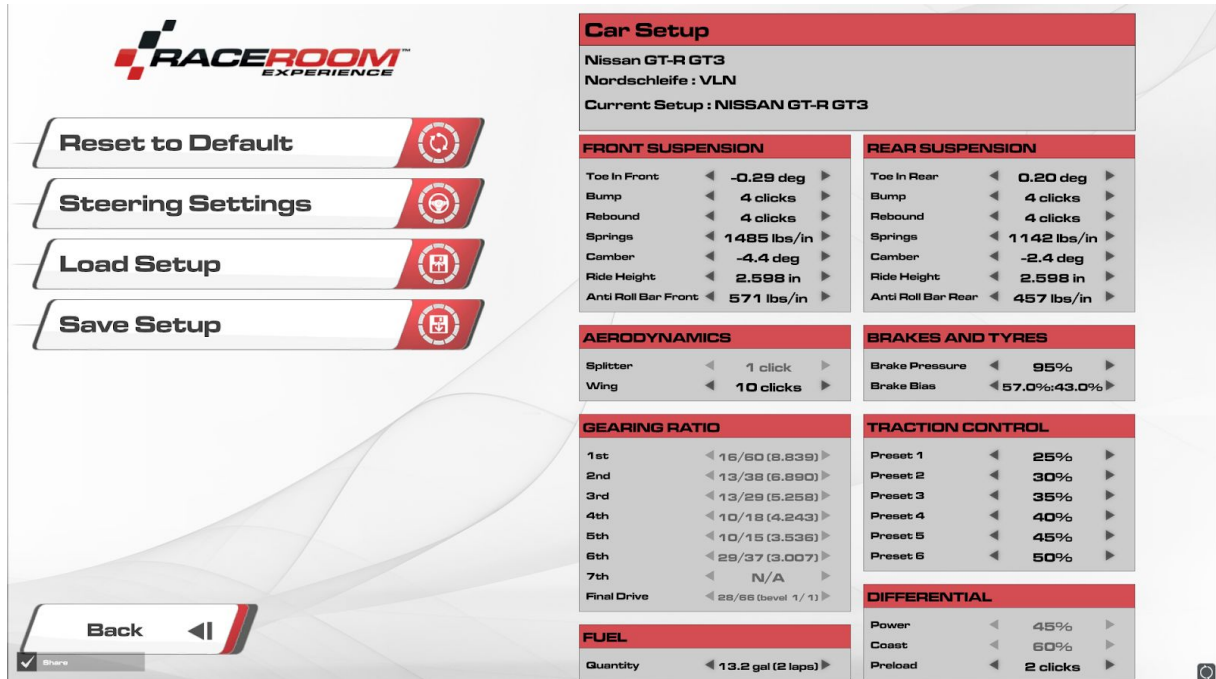


Fig 1. Car setup information displayed inside of the RaceRoom game.

Talking about user created cars and content, Jean-François mentioned that many simulator games let their players tweak a small number of variables for their cars before racing (fig 1), but not much more than that. Some games offer the addition of custom cars to the game, by letting players add their own variable configuration files, but since these numbers are very hard to get right, these cars usually behave quite unrealistically. The biggest hurdle being most of the time the tyre model. How tyres have grip and lose it is something that is very hard to get data for, and something that is continuously updated and improved on all simulators ("New Tyre Model" being a regular matter of endless debates amongst the Sim Racing community).

Working with manufacturers and racing teams, Jean-François mentioned that professional racing teams almost always are very keen on appearing in simulator games. Manufacturers and brands have been less interested, but with the rise of esports, they've gained a much bigger interest in this. Many professional drivers also use simulators for driving training (focus mostly).

RACEROOM

More information about RaceRoom can be found on their webpage:

<http://game.raceroom.com/>

RaceRoom is free to play (with optional in-game purchases) and can be acquired via the game platform Steam here:

https://store.steampowered.com/app/211500/RaceRoom_Racing_Experience/