

Development of Driver in the Loop lap time simulator for a Formula Student racecar.

OUR PROJECT

Formula Electric Belgium is a student-run electric race team which competes in Formula Student, the world's largest competition for engineering students. We aim to push the limits of performance, innovation and sustainability within electric racing every year, which is only possible with the help of our Thesis students. These pioneers are responsible for performance-defining innovations within the team, and we would love for you to join our team of highly ambitious and motivated engineers. As a Thesis student, you will research, design, prototype and test your innovations alongside the full-time members which make sure the team pushes itself and the car to new heights.

AIM AND OBJECTIVE

The aim of this master's thesis is to develop a driver-in-the-loop (DIL) lap time simulator using MATLAB and IPG CarMaker, capable of accurately modeling vehicle dynamics and driver interactions in a virtual environment. A central objective of the work is to gain a thorough understanding of vehicle dynamics, driver behavior, and simulation fidelity, and to translate this knowledge into a functional simulator that can generate reliable lap time data. MATLAB is employed for control algorithms and data analysis, while IPG CarMaker serves as the primary platform for vehicle modeling and real-time simulation.

Particular emphasis is placed on the integration of realistic driver feedback mechanisms, including steering, pedal, and visual inputs, to ensure an immersive and accurate driving experience. The simulator architecture is designed for modularity, allowing adjustments of vehicle parameters, track conditions, and control strategies to facilitate targeted testing and iterative development. Validation of the simulator focuses on reproducing consistent lap time performance and vehicle response, enabling meaningful comparison across different setups and driver inputs.

PROFILE

- Strong interest in vehicle dynamics.
- Analytical and problem-solving mindset
- Motivated team player with strong communication skills
- Basic knowledge of MATLAB

RETURNS

- Unique experience within a racing team
- Genuine work experience to carry with you into your career
- Exposure to cutting edge technology and software

INTERESTED?



Send us your contact details and field of interest to

recruitment@formulaelectric.be