# Investigating the potential of active aerodynamic devices on a Formula Student electric race car

We are looking for motivated master students in Engineering Technology

## Project description:

Formula Electric Belgium (FEB) is a team of highly motivated engineering students that design and build an electric race car in one year's time. With our race car we then compete in the Formula Student competition during the summer. The Formula Student competition is the largest engineering student competition in the world in which universities from all over the world compete against each other. The competition is characterised by combustion vehicles, electric vehicles and since recently also autonomous vehicles. Formula Electric Belgium strives towards sustainable innovation and the raw performance of new technologies. That is why our team focuses on autonomous and electric race cars. Research and development applications will be made by postgraduate students in collaboration with thesis students from the KU Leuven and bachelor students from Thomas More.

## Thesis description:

In previous iterations of the car only passive aerodynamic devices like wings and a diffuser were used. Because the undertray and diffuser generate the most downforce of the entire car by accelerating the air underneath the car, it is interesting to investigate the potential of active elements like fans that increase this speed even more.
To assess the potential of active aerodynamic devices, the following parameters should be considered: the added weight, the added downforce, the added drag, the power consumed by the active elements and the feasibility of production, cost and assembly.

## Thesis objective:

In the team of Formula Electric Belgium, no previous research on active aerodynamic devices has been done. The main objective of this thesis is assessing the potential of these active elements.

The logical steps to come to a proper assessment of the active elements are:

- **Literature study**: research what has been done before, and what possibilities there are.
- **Design**: Propose a design based on your literature study that is feasible for production for the real race car.
- **Simulation part** : Simulate your proposed active aerodynamic devices on the race car and adapt your design accordingly to the results..
- **Validation part** : Build an accurate mock-up to validate the simulation results of your final design.

The final design should be a complete description of the dimensions, power output and placement of the active aerodynamic devices, such that it can be employed in the next race car.

## Profile:

- Interested in race car aerodynamics
- Basic knowledge of fluid dynamics
- Previous knowledge of Computational Fluid Dynamics (CFD) is recommended

## What do you gain?

- A unique engineering– and team experience where hard work and team atmosphere are central.
- Work with innovative technologies in a realistic environment.
- Create added value for your curriculum and the team

Are you interested? Please send your resume with accompanying motivation to:
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