

# Semi-active control algorithm on a self-developed ECU.



We are looking for two motivated master students Electronics and ICT Engineering Technology

## Project description:

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Formula Electric Belgium (**FEB**) is a team of highly motivated engineering students that build an electric formula student race car. Just like Formula 1 the team builds a brand-new car each year to compete in multiple international competitions during the race season. Formula Student is the largest international engineering and design competition in the world. The competition is characterized by combustion vehicles, electric vehicles and since recently also autonomous vehicles. Formula Electric Belgium strives towards innovations and the raw performance of technologies. It is for this reason that the team will focus on the autonomous/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:

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The ECU (Electronic Control Unit) is the brain of an electric race-car. It receives data from all the sensors, and controls the actuators in the car and most importantly: the motors and semi-active suspension. The Formula Electric team developed its own ECU 3 years ago. This ECU runs C-code in a Real-Time Operating System. This year a semi-active suspension system has been developed. This system adjusts the damping of the car while driving. This allows for a dynamic suspension system. The algorithms to control these are written in MatLab and need to be translated to C for us to be able to use our self developed ECU.

## Thesis objective:

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Develop C-code that can control the semi-active control system from our ECU. To do this you also have to take care to maintain proper timing for all other critical and non-critical tasks the ECU performs such as controlling the engine torque and checking safety parameters all over the car.

Find out what the most efficient way to control all these systems on the ECU and search for additional possibilities to run this code. Is it possible to move part of the workload to the actuator control boards? Is it more efficient to add a second ECU specifically for semi-active?

## Profile:

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- clean code (mainly C)
- interested in operating systems
- teamplayer

## What do you gain?

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

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

[recruitment@formulaelectric.be](mailto:recruitment@formulaelectric.be)

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