

TOYOTA MOTOR EUROPE NV/SA

I19-xx Hybrid Vehicle Research Model Based Design

Our Team:

Research & Development (R&D) in TME is responsible for development of attractive & competitive quality cars matching European customer requirements.

Our target is to develop solutions which can be implemented in the power-train system to reduce fuel consumption, cost, weight of TOYOTA`s vehicles as well as improve their performance supporting TOYOTA mission: 'ALWAYS MAKING BETTER CARS'.

The MBD (Model Based Design) team is part of the Powertrain Engineering group. Main activity is develop the vehicle's powertrain through system simulation (HiL, SiL). Aim is to meet the various requirements and expectations placed upon modern vehicles; low emissions & fuel consumption, performance, durability, fun-to-drive,...

Additionally to the system simulation the validation is done by physical testing methods (test bench, vehicle roller test cell, test track driving) as well as software tools for data processing, visualization and analysis.

Internship details:

You will be working within Hybrid Vehicle research section, tasks will include:

1. Efficiency improvement of vehicle development process: development of MBD tools and methodologies under supervision of engineer
2. Team support: study new concept (calibration, logic, hardware), evaluate benefit and side-effect of improvement strategies
3. Data analyzing: analyse simulation & test data and draw conclusions
4. Validation: validate simulation results with real vehicle data (e.g. CH-R HV)
5. Testing support: prepare a test plan together with engineer/ technician, support test execution

Profile

- Master student (mechanical engineering, mechatronics, etc.) looking for a long-term internship to gather practical business experience.
- Keen interest in advanced powertrain technologies and cars in general.
- Open, highly motivated personality, able to work in an independent way, hands-on mentality, flexible team player.
- Required computer skills: MS Office, MATLAB, Simulink.
- Good notions of and interest in programming / simulation.
- Knowledge of CAE SW is a merit e.g. Amesim, GTSuite or Simpack
- Must be able to effectively & clearly communicate in English (written & spoken).
- Owner of a driving license.

Place of Internship: Toyota Motor Europe R&D Center, Zaventem, Belgium

Starting date: May ~ April 2019

Duration: 6 months – 1year

Confidentiality: Due to business requirement, not all performed projects can be reflected in the internship report. This issue needs to be discussed with candidate/school in advance.

It is mandatory that applicants are students for the entire period of the internship. Interested in this internship, please apply online via www.toyotajobs.com.

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Gasoline engine modelling and simulation

Company general information:

TOYOTA is one of the world's largest automobile manufacturers and a leading global corporation.

Founded in 1937. Toyota now sells vehicles in 170 countries and employs over 300.000 people.

Based in Brussels, Belgium, and staffed by 2.700 people and more than 60 nationalities,

Toyota Motor Europe (TME) handles the wholesale marketing of Toyota and Lexus vehicles, parts & accessories, and manages Toyota's European R&D, manufacturing and engineering operations.

Team/division description

Toyota Technical Center (R&D) in Europe is responsible for the planning, development and production of attractive, superior quality cars matching European market requirements. R&D aims to strengthen the Toyota image in Europe.

The Powertrain Model Based Design department is responsible for developing simulation models and methods in order to support whole Powertrain division developments.

Your Project:

You will be involved in a gasoline engine R&D project where some advance control methodologies are developed to control complex air path layout. A strong part of the project is be dedicated to engine modelling and simulation in GT Power/ Matlab Simulink. A GT Power predictive engine model will be develop and validated with measurements by you to support control strategy validation. Some mean value and linear models will be developed also by you, in collaboration with the control engineer to support model based controller design.

You will be responsible of:

- Engine model development in GT Power/ Matlab Simulink
- Calibration of the GT power model with measured data
- Development of a mean value model in GT power
- Model validation and accuracy evaluation
- Measurement data post processing

Your profile:

- Student in last year of study, Combustion / Mechanical / Simulation engineering.
- Specific simulation software knowledge: Matlab/Simulink programming skills, GT-Power engine modelling skills.
- Good knowledge in automotive and powertrain system (Engine).

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- Strong out-of-box thinking.
- Flexible team player.
- Open personality and able to work in an independent way with hands-on mentality.
- Basic computer skills: Office Word, Excel, Powerpoint...
- Fluent in English.

Place of employment:

- Belgium - Brussels (Zaventem) : Toyota Motor Europe, Technical Centre

Starting date:

March 1st, 2019

Duration:

Min 6 months, 1 year is preferable

Confidentiality:

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I19-xx – Use of MBD to propose new Gasoline EAT system (TWC+GPF system optimization)

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Your Project:

Reduction of fuel consumption and pollutant emissions are the main challenges of the coming years to make engines attractive for customers while meeting future stringent emission regulations.

You will support our division to pre-develop new engine technologies by the mean of experiments and simulations to reduce pollutant emissions.

Your tasks will be:

- Develop catalyst and filter models to predict pollutant emissions along the exhaust line.
- Run engine and/or vehicle tests to validate the prediction of simulation results
- Support exhaust aftertreatment design adapted to future European vehicle
- Deep analysis of the test or simulation data to draw relevant conclusions

Your profile:

- Student in last year of study, Combustion / Mechanical / Chemistry engineer.
- Strong out-of-box thinking.
- Capability to run several activities in parallel.

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- Good knowledge in automotive and powertrain system (Engine, Exhaust after-treatment).
- Flexible team player.
- Open personality and able to work in an independent way with hands-on mentality.
- Required computer skills: MS Office, basic MATLAB/Simulink knowledge.
- Interest in programming/simulation.
- Knowledge of CAE software is a plus: e.g. Axisuite.
- Fluent in English, any other European language is a plus.
- Owner of a driving license is preferred.

Place of employment:

- Belgium - Brussels (Zaventem) : Toyota Motor Europe, Technical Centre

Starting date: March 1st, 2019

Duration: Min 6 months

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