

## Master's thesis (30 ECTS)

### Working title: Design of a Testbench for Innovative Torque Sensing Technology for Automotive Application

In cooperation with: **Infineon Technologies AG**

In any powertrain or power-transmitting component, torque is a fundamental physical quantity. Until now, however, torque has only been measured indirectly, for example in electric drives by measuring current and voltage or in vehicle dynamics control by measuring acceleration and speed. The reason for this is that there is still no torque sensor for drive components in real environmental conditions. Direct measurement of this variable offers the possibility of further optimizing drive and vehicle dynamics control systems while reducing the number of sensors. This is especially essential for autonomous driving and in robotics. A sophisticated test bench is required for the development of such a sensor system. Above all, this should offer the possibility of a direct reference measurement of the torque. High-resolution optical incremental encoders are envisaged for this purpose. The torque is generated by two DC motors, a drive motor and a brake motor. **The aim of the master thesis is to design and build such a test bench.**

#### Tasks:

- Development of a test bench for torque sensors
- Implementation of optical incremental encoders as reference measurement
- Signal evaluation of the optical encoders
- Implementation of the control of the DC motors

#### Requirements:

Education: Electrical Engineering, Information and Computer Engineering

Expert knowledge: Microcontroller programming, FPGA programming, control engineering

### Organizational matters:

- Contractual partner: Infineon Technologies AG
- Duration: 6 month
- Location: Graz
- Start date: May 2021

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