AUSTRIAN INSTITUTE OF TECHNOLOGY
TOMORROW TODAY

AIT Austrian Institute of Technology

Mobility Department
Electric Drive Technologies
Giefinggasse 2 | 1210 Vienna, Austria
www.ait.ac.at

Helmut Oberguggenberger
Head of Business Unit
T +43 (0) 50550 - 6625
F +43 (0) 50550 - 6595
E helmut.oberguggenberger@ait.ac.at

ELECTRIC DRIVE TECHNOLOGIES

Mobility Department

MOBILITY DEPARTMENT BUSINESS UNIT

ELECTRIC DRIVE TECHNOLOGIES

The shift from the conventional vehicle towards the various hybrid technologies and purely electrically driven vehicles has already begun. The range of micro, mild, full and plug-in hybrids already available or poised for launch is a clear indicator that electromobility is regarded as our biggest short-to-medium-term hope for environmentally-friendly mobility.

In recent years, the Mobility Department's Electric Drive Technologies Business Unit has positioned itself as a recognised development centre for electric drive concepts, helping both manufacturers and suppliers adapt to the electric era.

The team of around 35 researchers is focused on optimising not just the energy storage device, i.e. the battery, but also the entire powertrain, from the power electronics to the final drive as well as the vehicle itself, in a bid to extract maximum efficiency.

Using sophisticated simulation methods, experts combine the thermal, electrical and mechanical properties of the various components of the powertrain in order to be able to simulate the entire vehicle as accurately as possible and to optimise it accordingly.

PORTFOLIO

Modelling, Simulation and Library Development of Electric Drives and Vehicles

Modelling and simulation are essential to electromobility and the development of alternative vehicle concepts, allowing the complex relationships between individual components and the „vehicular" system as a whole to be simulated as realistically as possible.

The Mobility Department develops multiphysical models which encompass all relevant electrical, magnetic, mechanical and thermal aspects and which are archived in application-specific Modelica libraries. The simulations which are possible as a result form a solid scientific basis for the optimisation and development of new components and vehicle concepts. The research teams' expertise ranges from the modelling of electrical machines, including engine control, power electronics and electrical energy storage systems, to the simulation of the entire vehicle and monitoring during operation.

Scope of Services

- Vehicle
- Electrical Energy Storage Systems
- Power Electronics and Electrical Machines
- Monitoring and Control
- CFD

Design and Prototyping of Electric Components

The Mobility Department's systemic approach to electric drive technology plays a major role with regard to design and prototyping in particular. When it comes to designing individual components, the entire electric drive train, i.e. the battery, motor and power electronics, are developed and optimised as an overall system.

The combination of several years of expertise and cutting-edge software tools leads to innovative design solutions and efficient measuring and control concepts. One USP of the Mobility Department is the seamless interplay between simulation, design and validation. This ensures that customer requirements are implemented quickly and efficiently in customised prototypes – thereby helping to reduce development times considerably.

Scope of Services

- Electrical Energy Storage Systems
- Power Electronics and Electrical Machines

Testing and Validation of Electric Components

The development of new vehicle concepts necessitates detailed information about the electrical, thermal and mechanical characteristics of individual components and entire drives. Thanks to a sophisticated laboratory infrastructure, the Mobility Department is able to provide these data for all relevant components – from electrical machines and power electronics to electric energy storage systems and entire vehicles. The department also specialises in combining measuring techniques with simulation for demanding Hardware-in-the-Loop tests.

As an accredited test centre, the AIT boasts several years' experience in the performance of standards testing on technical devices and, as a member of international standards committees, is actively involved in the definition of new testing procedures and standards.

Scope of Services

- Vehicle
- Electrical Energy Storage Systems
- Power Electronics and Electrical Machines
- Environmental Testing