



CENTER OF EXCELLENCE AUTOMOTIVE | MOBILITY

ACHIEVE MORE
THROUGH RESEARCH & DEVELOPMENT

forschung.fh-ooe.at



ACHIEVE MORE WITH AUSTRIA'S STRONGEST RESEARCH UNIVERSITY

Successful businesses know from experience: Every euro that goes into research and development pays for itself many times over. This is because innovations give those businesses a decisive competitive edge, generating revenue and securing jobs in the long run.

As a centre of research, Upper Austria is in the fast lane, and the University of Applied Sciences Upper Austria (University of Applied Sciences Upper Austria) has become a driving force. Austria's most research-intensive university of applied sciences offers innovative businesses its four campuses and approximately 400 professors and academic staff. Currently, over 400 projects in 17 specialist areas of research are being implemented.

Areas of Applied Research:

- » IT (Hagenberg Campus)
- » Medical Engineering and Applied Social Sciences (Linz Campus)
- » Management (Steyr Campus)
- » Engineering (Wels Campus)

Perfect networking of the campuses makes it possible to achieve an optimal overall solution for each project.

The State of Upper Austria is undertaking joint initiatives in the areas of education, research and business through the strategic economic and research programme to ensure that Upper Austria retains a clear competitive edge.

The automotive and mobility sectors are essential for Upper Austria, which is taking on a leading role in areas such as drive concepts, vehicles, lightweight design and innovative composite materials. A broad range of business-facilitates individual solutions and improves competitiveness.


The Center of Excellence Automotive | Mobility was established in order to meet the requirements of the strategic programme 'Innovative Upper Austria 2020'. The Center's projects support the achievement of the programme's strategic objectives.

The State of Upper Austria has in the University of Applied Sciences Upper Austria a longstanding partner in the field of research and development that actively supports the achievement of its strategic objectives.




Mag. Thomas Stelzer
State Governor of Upper Austria




Markus Achleitner
Minister of Economy and Research of Upper Austria



COOPERATION MADE EASY

With more than 400 researchers, the University of Applied Sciences Upper Austria is on hand as a flexible and reliable partner for addressing research and development issues with businesses and institutions from industry and society.

The possibilities for cooperation are numerous and varied:

- » Applied R&D projects with business partners
- » Academic research projects
- » International R&D projects
- » Symposia and workshops
- » Students' bachelor's and master's theses

Project time frames can range from a few months to up to five years.

The University of Applied Sciences Upper Austria offers its R&D support to businesses and institutions from industry and society.

This includes on the one hand businesses which lack personnel resources or have limited financial resources for their own research and development activities (e.g. small and medium-sized enterprises).

On the other hand, solutions for companies needing specialised support (e.g. in the form of special equipment) are also available. For the University of Applied Sciences Upper Austria's cooperation partners, a joint project is, above all, a financially straightforward and efficient undertaking.

Geared towards the needs of the client, innovative solutions will be developed that can be put directly into practice.



*Dr. Gerald Reisinger
President University of Applied Sciences Upper Austria*



*Prok. Prof. Priv.-Doz. Dipl.-Ing. Dr. Johann Kastner
Vice President FH OÖ Forschungs & Entwicklungs GmbH*



Thematic Areas:

- » Lightweight Design and Materials
- » Smart Drive and Vehicle Technologies
- » Connected Mobility

ACHIEVE MORE THROUGH AUTOMOTIVE | MOBILITY

In the **Automotive | Mobility** sector, the University of Applied Sciences Upper Austria is pursuing an interdisciplinary and holistic approach that aims to achieve more efficient, safer, user-friendlier and socially and environmentally compatible mobility of people and goods. Intensive research is being conducted in the areas of lightweight design and materials, new drive technologies and connected mobility.

Focus on Lightweight Design and Materials

- » Composites (especially carbon composites), plastics and metals for applications in the automotive and aeronautical industries
- » Hybrid materials and structures
- » Automation of the fabrication of composite and hybrid metal-composite structures using automated fibre placement, thermoforming, diaphragm forming, etc.
- » Plastics and metal processing
- » Press hardening as a manufacturing process for lightweight structural steels
- » Process simulation for processing plastics, metals and composites
- » Surface technology for lightweight design
- » Joining technologies
- » Recycling of plastics, composites and metals
- » Materials testing and characterisation including non-destructive methods (X-ray computer tomography, active thermography, etc.)
- » Mechanical engineering, mechanics, strength of materials, machine dynamics and machine elements
- » Material modelling and structural analysis (such as static and dynamic loads, crash behaviour)
- » Design and use of lightweight structures in mobility applications

Focus on Smart Drive and Vehicle Technologies

- » Powertrain: Consideration of the entire hybrid powertrain from the motor to the road (design, simulation, etc.)
- » Drives: Design, optimisation and algorithm development for drives (hybrid, electric motor, combustion), micro test stands
- » Energy sources: Model development and optimisation of mobile – e.g. hydrogen-based –drive concepts
- » Energy storage: Model development including service life predictions and testing of mobile battery systems
- » Performance and control electronics: Development of power and control electronics (mobile and stationary), including algorithms, using model-based methods for overall system design
- » Model-based algorithms: Development of model-, pattern- and data-based algorithms for control, monitoring and error diagnosis or service life prediction (e.g. drive train, bearings, etc.)
- » Simulation: Simulation of mechatronic systems based on physical models, especially multi-body simulation. Development of real-time simulation models
- » Sensor technology: Application-oriented sensor selection and development, real-time radio transmission, energy harvesting, replacement or improved evaluation of sensor systems through model-based algorithms
- » ECU: Functional development of vehicle ECU software, HIL (hardware in the loop) simulation development including real-time models and testing
- » Energy management: Development of operational strategies, optimisation, (standardised) driving cycles, holistic consideration of operating cycles, production and disposal

Focus on Connected Mobility

- » Communication between individual vehicles and between the vehicle and road infrastructure
- » Strategies for automated driving
- » Algorithms for the efficient use of road networks
- » Services (safety relevant, efficiency enhancing, infotainment)
- » Modelling of human driving behaviour
- » Mixed traffic with automated and human controlled vehicles
- » Digitalisation to improve public transport services
- » Human-vehicle interaction
- » User interface design and expansion of communication and perception processes
- » Development of new visualisation capabilities and interactive interfaces, exploration and design of novel graphical user interfaces

Cutting-Edge Infrastructure on Every Campus

- » Materials engineering laboratory: Lightweight design, including surface coatings, etc.
- » Plastics processing: Blown film line, thermoforming station, etc.
- » Composite production lines (diaphragm and press forming, etc.)
- » Materials testing laboratory: X-ray computer tomography, active thermography, strain field measuring system, etc.)
- » Drive technology and electric drive laboratory
- » Machine dynamics laboratory
- » Simulation and optimisation tools
- » Computing cluster
- » Test vehicles (BMW X1, BMW i8)
- » Media Interaction Lab
- » Small combustion engine test stand
- » Electric motor test stands
- » dSpace HIL simulators
- » dSpace prototyping systems

ACHIEVE MORE WITH THE EXPERTS FOR AUTOMOTIVE AND MOBILITY

Current Research Projects

- » **ADAM** / Advanced multimodal data analysis and visualization of composites based on grating inter-ferometer micro-CT data / BRIDGE Early Phase
- » **aDrive** / The Automated Car / FFG – industry-related dissertations
- » **ANDISIA** / Automated non-destructive material testing / Production Center Upper Austria 2050: Industry 4.0 / Partners: Teufelberger, Softwerk, JKU Linz
- » **APMT** / Advanced Polymeric Materials and Process Technologies / FFG COMET K project
- » **Clean Motion Offensive – WP30** / Technology Lighthouses for Electromobility
- » **Connected Vehicles** / EU EFRE
- » **DisMoSim** (Wolfgang Witteveen) Concept; the prototypical implementation and evaluation of new digital tools and algorithms to support collaborative development in different locations / COIN Capacity Building
- » **DynaCon** / The Embedding of the Adjoint Method in Multibody Dynamics / Firnberg Stipend
- » **EBIM-ÖV** / Collaborative project with STUDIA /EU EFRE IWB 2020 programme
- » **Effect of Defect** / FFG – Take Off / Partners: FACC, Peak Technology
- » **FiberWave** / Influences of out-of-plane fibre waviness on the mechanical properties of composite materials / FFG – BRIDGE 1 / Partner: FACC AG
- » **Ikarus** / Innovative, cost-efficient production and design of sandwich components with lattice structure made of polymer foam / FFG – Take Off / Partners: FACC, LiteCon, PCCL
- » **Innovative Lightweight Structural Steels for Automotive Applications** / Commissioned project
- » **INTERAQCT** / International Network for the Training of Early stage Researchers on Advanced Quality control by Computed Tomography / EU – FP 7
- » **LEEFF** / Low Emission Electric Freight Fleets / FFG – Technology Lighthouses for Electromobility / Partners: i_LOG, BOKU Wien, Uni Wien, Kreisel, SATIAMO, Energie Ingenieure GmbH, SMATRICES, Schachinger, Greenway, SPAR, Quehenberger, Consistix, Oberaigner
- » **MiCi** / Multimodal and in situ characterisation methods for inhomogeneous materials / EU EFRE/ IWB
- » **MMZ** / Methods for Mobility of the Future / Land OÖ / FTI
- » **ProFVK** / Industrial automated production processes for the processing of fibrereinforced plastics and for the production of lightweight structures / EU EFRE/IWB /Partner: TCKT
- » **ProSim** / Process simulation for the automation of composite production / FFG COIN Capacity Building
- » **ProtoFrame** / Framework and frontend for partially automated reconciliation of real and virtual prototypes / FFG COIN Capacity Building

CURRENT DEGREE PROGRAMMES

- » **Quality Skill** / FFG – Production of the Future / Partners: PROFACTOR, FACC, FILL, Benteler-SGL
- » **RClowCap** / Zero CO₂ fuels and hybrid propulsion technologies
- » **RE2-Mix** / Reactive extrusion in recycling for quality improvement
- » **Smart Traffic** / EU EFRE Regio 13
- » **SpaceXCT** / SpaceXCT – X-ray Techniques for NDT and damage characterization of space materials and components / FFG – ASAP 12 Projekte 2015
- » **StructureWave** / Effects of Defects: Effect of Fiber Waviness on Structural Composite Parts / University of Applied Sciences Upper Austria dissertation program
- » **ZPT+** / K-Project for non-destructive testing and tomography Plus / FFG – COMET K-Projekte

Hagenberg Campus

- B** Automotive Computing
- M** Embedded Systems Design
- M** Human-Centered Computing
- B M** Mobile Computing
- M** Software Engineering

Wels Campus

- B M** Automation Engineering
- M** Automotive Mechatronics & Management
- B M** Mechanical Engineering
- B M** Materials and Process Engineering
- B M** Innovation Engineering and Management
- B M** Mechatronics and Business Management
- B M** Lightweight Design and Composite Materials

B = Bachelor's degree programme, M = Master's degree programme

YOUR POINTS OF CONTACT



Head of Center of Excellence and Lightweight Design and Materials, Wels Campus
Prof. DI Dr. Roland Markus Hinterhölzl
Stelzhamerstraße 23, 4600 Wels
Phone: +43 5 0804 44550
roland.hinterhoelzl@fh-wels.at



Head of Smart Drive and Vehicle Technologies, Wels Campus
Prof. DI Dr. Gernot Grabmair
Stelzhamerstraße 23, 4600 Wels
Phone: +43 5 0804 43490
gernot.grabmair@fh-wels.at



Head of Connected Mobility, Hagenberg Campus
Prof. DI Dr. Gerald Ostermayer
Softwarepark 11, 4232 Hagenberg
Phone: +43 5 0804 22820
gerald.ostermayer@fh-hagenberg.at



Coordination Center of Excellence Automotive & Mobility
DI Dr. Michael Thor MSc
Stelzhamerstraße 23, 4600 Wels
Phone: +43 5 0804 44427
michael.thor@fh-wels.at

CENTER OF EXCELLENCE AUTOMOTIVE | MOBILITY

University of Applied Sciences Upper Austria Research & Development

FH OÖ Forschungs & Entwicklungs GmbH
Roseggerstraße 15
4600 Wels/Austria
Phone: +43 5 0804 14120
research@fh-ooe.at
forschung.fh-ooe.at

Imprint: Responsible for the content: University of Applied Sciences Upper Austria
President Dr. Gerald Reisinger, Prok. Prof. Priv.Do. DI Dr. Johann Kastner
Text: Christine Pointinger, MA; person responsible at the Center of Excellence
Photos: University of Applied Sciences Upper Austria, State of Upper Austria, Fotolia
Updated: December 2021



RESEARCH &
DEVELOPMENT

