PLATFORM FOR
MOBILITY AND LOGISTICS

ACHIEVE MORE
THROUGH RESEARCH & DEVELOPMENT

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UNIVERSITY
OF APPLIED SCIENCES
UPPER AUSTRIA

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with Austria's strongest research University of Applied Sciences

Successful businesses can tell you from experience: Every euro which goes into research and development pays for itself a thousand times over.

This is because innovations give those businesses a decisive competitive edge, generating revenue and securing jobs in the long-run.

The research location of Upper Austria is in the fast lane, and the University of Applied Sciences Upper Austria (FH Upper Austria) has evolved into a powerful engine. Austria's strongest research University of Applied Sciences offers four schools with around 400 professors and academic staff to innovative businesses.

Currently, over 300 projects in 16 specialist areas are being implemented. The practice-oriented topics range from IT (FH Upper Austria Hagenberg Campus), to Medical Engineering and Applied Social Sciences (FH Upper Austria Linz Campus), as well as Management (FH Upper Austria Steyr Campus), and Engineering (FH Upper Austria Wels Campus).

Perfect networking of the schools ensures that it is possible to achieve an optimal complete solution for each project.

The strategic programme "Innovative Upper Austria 2020 – Research. Business. Future" was accommodated by the Platform for Energy. This Platform's projects provide support in achieving strategic key objectives:

» **Upper Austria in 2020 is a region with energy and resource-efficient, multi-modal mobility and logistics systems**, something which optimally meets the mobility needs of people and goods. Intelligent communication and traffic management systems, as well as the optimisation of supply networks, play an important role.

» **The strengths in the sector of vehicle and drive concepts** (light-weight construction and drive systems, etc.) will likewise be expanded by 2020, as will solutions in the sector of production-related logistics.

Dr. Josef Pühringer
Governor of Upper Austria

Mag. Thomas Stelzer
Vice Governor

Upper Austria has introduced the possibility for joint initiatives in the sectors of education – research – business through the strategic economic and research programme "Innovative Upper Austria 2020", in order to ensure that Upper Austria has a clear competitive edge.

The sectors of mobility and logistics are essential for the location of Upper Austria. With topics such as drive concepts and vehicles, Upper Austria is taking up a leading role in this area. A broad range of businesses allow for individual solutions and improved competitiveness.

With the FH Upper Austria as a long-term, reliable partner in the sectors of research & development, the State of Upper Austria is provided with support in achieving the implemented, strategic key objectives.

Achieve more:
Cooperation made easy

With its 400 plus researchers, the FH Upper Austria is on hand as a flexible and reliable partner for businesses and institutions from industry and society when it comes to problems in research & development. The possibilities of cooperation are diverse:

» applied R&D projects with business partners

» academic research projects

» international R&D projects

» symposia and workshops

» students' bachelor's papers and master's theses

The project time frame can range from a few months to up to five years.

The FH Upper Austria´s R&D offers are aimed at businesses and institutions from industry and society.

On the one hand, this addresses those businesses which lack personnel resources or have limited financial resources for their own research and development activities (e.g. small and medium-sized companies).

On the other hand, solutions for companies which need support in specialist fields are also developed (e.g. in the form of specific devices). Above all, a joint project is, for the FH Upper Austria's cooperation partners, a financially straightforward and efficient undertaking.

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

Dr. Gerald Reisinger
University of Applied Sciences Upper Austria
President

Prok. FH-Prof. Priv.Doz. Dipl.-Ing. Dr Johann Kastner
University of Applied Sciences Upper Austria Research & Development
Chief Technology Officer

Achieve more
through innovative mobility and logistics

The FH Upper Austria is pursuing an interdisciplinary and holistic approach in the mobility industry aiming to achieve more efficient, secure, user-friendly, socially and environmentally compatible mobility of people and goods. The following topic areas are being intensively researched with regard to the following issues: drive technologies, vehicle communication and lightweight structural construction, and new composite materials.

The core of the logistics industry is to be found in the Logistikum, Steyr. In terms of content, the entire logistics discipline is covered by research offers. Thus, for the logistics industry, excellence is synonymous with innovation through built-in capabilities and solutions with low reactive power for the purposes of the innovation chain.

Specialist areas regarding logistics

Specialist areas regarding content:

» Trade & Last Mile with the vision of “Multi-channel model region Upper Austria in trade”

» Logistics optimisation and development of the global cyber-physical value-added chain

» Logistics technology for networked systems

» Development of the physical internet and the European hub of the “Physical internet model region for selected branches”

» Measuring of energy efficiency for technology and processes

» International hub of market-oriented and resilient value-added networks

» Efficient and resource-conserving usage of modes of transport, multi- and synchro-modality

» Industrial mobility between the interfaces goods, people, location/infrastructure and information (“ITS for freight”)

» With resilience concerning the supply chain and business success through the identification and development of individual and organisational capabilities for increasing businesses’ capacities for growth and resistance

Specialist areas regarding methods/tools:

» Visualisation, optimisation and analytical tools, e.g. graphical user interface, algorithm prototyping, evolutionary algorithms, genetic programming, data analysis, simulation-based optimisation, experiment design and analysis, plugin-based architecture

» Findings and tools from the fields of interaction design and user experience (UX), e.g. eye tracking, analysis and modelling tools for user models

» Graphic information systems (GIS) and tools from the field of software products ArcGIS for the analysis and visualisation of geo data

» Simulation tools such as AnyLogic for simulating supply chains and logistics, as well as programmes for dynamic modelling

» Methodology for holistic analysis and model simulation of complex and dynamic systems (system dynamics) and the methodology of “Living Labs”

Specialist areas regarding mobility

Engineering design – light-weight structural construction

» Mechanical construction, mechanics, strength of materials, machine dynamics and machine elements

» Usage of light-weight structures in the mobility industry

» Sizing and calculation procedures (e.g. dynamic loads and crash procedures)

» Multi-body dynamics, system identification and modelling for drive elements, as well as assessment and interpretation of simulation results

Materials technology – light-weight structural construction

» Plastics and new composite materials, particularly carbon-fibre reinforced plastics for usage in the automobile and aircraft industries

» Metal and surface technology for light-weight construction

» Materials testing and characterisation, including x-ray, computed tomography and active thermography

» Plastics and metal processing procedures

» New manufacturing procedures, e.g. generative manufacturing of topologically-optimized light-weight components (3D printing) and press hardening as a manufacturing procedure for lightweight structural construction from ultra high strength steels, innovative processing of organo sheets and tapes.

Measuring and control technology – Drive technology

» Sensor-technical detection of process parameters with standard sensors (position, force, temperature, etc.) and with cameras (optical measuring technology, image processing)

» Preparation of models and concepts derived from this, particularly model-based, predictive procedures

» Design and optimisation of control loops, with all relevant mechatronic components depicted (mechanics, elements of electrics and electronics, hydraulics and pneumatics as well as powertrains)

Networks and mobility – vehicle communication

» Mobile communication and novel communication technologies for all aspects of vehicles

» Communication between individual vehicles and communication between vehicle and infrastructure close to the road

» Research and tests regarding self-driving vehicles

» Modelling of the increase in vehicles and the reciprocal effect of this on communication

Media Interaction Lab – communication between humans and vehicles

» Interaction procedures between humans and computers

» Design of user interfaces and expansion of communication and perception processes

» Development of new visualisation possibilities and interactive interfaces, research and design of novel graphic user interfaces

» Development of rendering methods, particularly for large, interactive displays

Achieve more
through pioneering infrastructure

- Materials technology laboratory – light-weight construction
- Plastics processing: blown film line, thermoforming station, etc.
- Materials test laboratory: X-ray computed tomography, active thermography, etc.
- Drive technology and electric drive laboratory
- Machine dynamics laboratory
- Simulation and optimisation tools
- Logistics technology laboratory
- Computer cluster
- Test vehicle (BMW X1)
- Media Interaction Lab

Achieving more:
current research projects

- **3D simulation of damage accumulation** – direction dependent, fibre-reinforced plastics by means of computer tomography / FFG (Austrian Research Promotion Agency) production / partners: TU Wien, Zizala, dTech
- **aDrive** – FFG industry-oriented dissertations
- **BioBoost** – biomass-based energy intermediates boosting biofuel production / EU FP7
- **ChemLog T&T** – Tracking & Tracing solutions for improvement of intermodal transport of danger-ous goods in CEE / Interreg
- **The methods of the adjoint equations** in multi-body dynamics / FWF (The Austrian Science Fund) Hertha Firnberg Scholarship
- **ECOPowerderive** / FFG K-project / partners: BRP-Rotax, Stihl, AVL
- **Effect of Defect** / FFG aeronautical research / FACC, Peak Technology
- **FINCA** – Forecasting indicators / FFG bridge / partners: voestalpine Straßensicherheit SHT, vetropack
- **Food4all@home** – nation-wide home delivery of everyday necessities / FFG mobility of the future / partners: Österreichische Post AG, Pfeiffer HandelsgmbH, RISC Software GmbH
- **GepäckLOS (luggage-free)** – FFG mobility of the future / partner: ÖBB Holding AG
- **HINT** – Harmonised Inland Navigation Transport through education and information technology / EU SEE
- **KMU future check** / Interreg / partner: Deggendorf Institute of Technology / Grafenau
- **KoLaMBra** – development of an integrated organisational concept for a cooperative Last Mile branch logistics / FFG mobility of the future
- **LNG Masterplan** – Liquefied Natural Gas master plan for Rhine-Main-Danube / EU TEN-T / partner: Pro Danube
- **LNG Upper Austria** – Liquefied Natural Gas for Upper Austria / Upper Austria 2010 / partners: The State of Upper Austria, Linz A, voestalpine Stahl GmbH
- **Log4Green** – transport clusters development and implementation measures of a 6 region strategic joint action plan for knowledge-based regional innovation / EU FP7 / partners: EAK Entwicklungsagentur Kärnten, VNL-Süd
- **MKS2020** (Multibody simulation 2020) / ERDF Regio 13 / partner: BMW
- **Protoframe** / FFG Coin (Cooperation and Innovation) development / partners: RECOM, Trodat, Fronius
- **Quicom** – quantitative inspection of complex composite aeronautic parts using advanced X-ray techniques / EU FP7
- **QSAM** – Quick Scan Audit Methodology for Supply Chain Diagnostics / EU Regio 13 / partner: Sydney Business School/University of Wollongong, Australia
- **ReSCUE** – resilience concerning the supply chain and business success / FFG Bridge / partners: MAGNA, SKF, voestalpine
- **SmartBox** / FFG mobility of the future / partners: St Pölten University of Applied Sciences, TU Wien, netwiss, Österr. PostAG, CHEP Österreich und ÖBB
- **Smart traffic** / ERDF Regio 13
- **SynChain** – Synchro-modal logistics chains / FFG mobility of the future / partner: AIT (Austrian Institute of Technology)
- **Thermoplastic composite materials** with novel performance profile / ERDF Regio 13
- **TRIUMPH II** – Trimodal hub Hafen II / FFG mobility of the future / partners: AIT, Ennshafen OÖ GmbH, GS1 Austria GmbH, RISC Software GmbH, via donau

Achieve more: Studies with reference to mobility and logistics

School of Informatics, Communications and Media, Hagenberg Campus

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

School of Management Steyr Campus

Digital Business Management ..... M
International Logistics Management ..... B
Supply Chain Management ..... M

School of Engineering Wels Campus

Automation Engineering ..... B M
Mechanical Engineering ..... B M
Materials and Process Engineering ..... B M
Innovation Engineering and Management ..... B M
Mechatronics and Business Management ..... B M

B – Bachelor's Degree Programme, M – Master's Degree Programme

At your service: Your contact partners

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