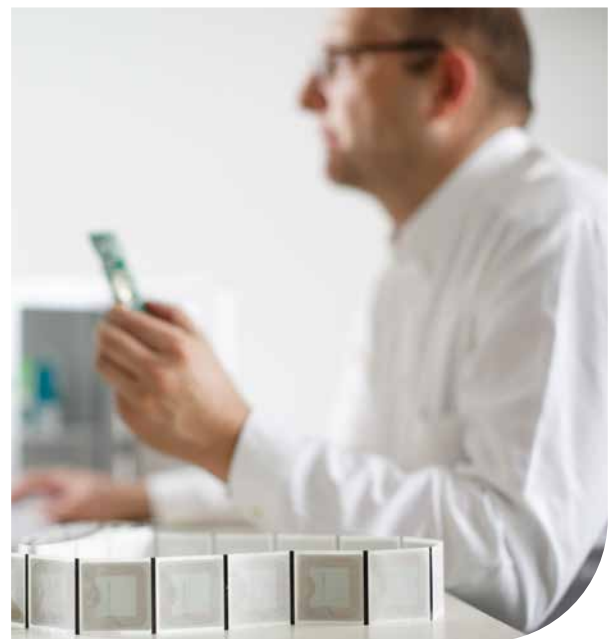




DIGITAL

Institute for
Information and Communication Technologies



The future is DIGITAL!

Sensing, analysing and networking in the digital world – that's the passion that drives our researchers.

No matter whether it's multi-sensor innovations, tomorrow's satellite communication or the next Industrial Revolution with the aid of smart information management – we are always ready to face international competition in research.

It is of equal importance to us that our work not only generates new and innovative products via our role as innovator, but also creates competitive advantage for our clients in a wide range of business areas via our role as business enabler.

Dr Heinz Mayer, Director



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DIGITAL – Institute for Information and Communication Technologies

Over the next few years, digital innovation and transformation will be the major economic factors driving fundamental change in traditional behaviour, production processes and even complete businesses and industrial sectors. Digitalisation affects not only production and industry, but practically all areas of life such as ecology, mobility, energy, social communication and much more. DIGITAL, with its many years of experience in sensing and signal processing, communication and navigation technology, and the management of web, internet and information, is a reliable partner for pragmatic, high-tech solutions for all these fields of application.



- **Connected Computing**
- **Cyber Security and Defence**
- **Machine Vision Applications**
- **Intelligent Acoustic Solutions**
- **Remote Sensing and Geoinformation**
- **Space and Communication Technology**

Our clients' benefits

Our clients benefit from the pragmatic and problem-solving approach we apply to our research. As one of the leading international research and innovation providers in information and communication technology, we provide innovative solutions, either evolutionary or game-changing, depending on the degree to which internal processes can be changed.

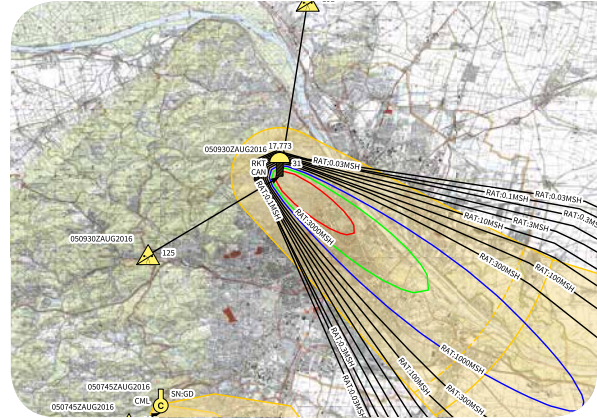
Working closely together with the client, we develop innovative solutions to product status and provide continuous product development.

Clients enjoy the long-term support we can provide and the access to sound technological expertise we have acquired over the years.

Our services

Our services range from short- and long-term support of in-house research projects to turnkey projects culminating in clearly defined deliverables.

We offer application-oriented research in line with the highest international standards in science. Clients have access to our experts, who are all specialists in their particular fields, and who receive regular opportunities to increase their knowledge through training. Our strength is the ability to implement the research results into industry-ready prototypes within a professionally managed project.

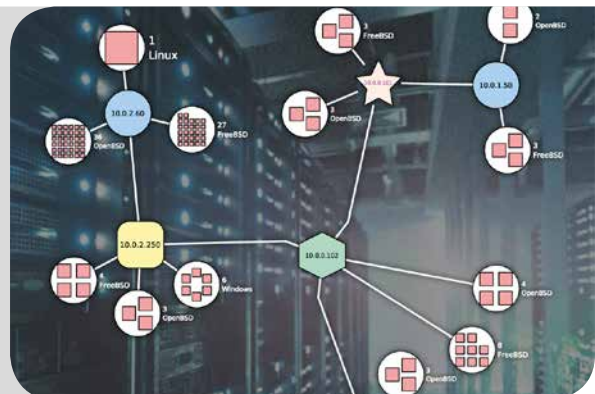


Cyber Security and Defence

Improved insights into the vulnerability towards cyber-attacks can be gained thanks to new methods for the security-related analyses of IT networks. Our analyses are particularly focused on IoT systems as employed by smart homes, industrial production and autonomous driving. Digitalisation is creating new challenges for the defence sector. Our experience in the development of military information systems forms an important base for the design of interoperable solutions. New tools aimed at increasing cyber-defence capability improve the applicability of cyber-security to companies and authorities.

- **Tailored cyber-security models**
 Cyber-risk analyses, protective measures and measurement of effectiveness
- **Military expert information and decision-support systems**
 Pragmatic solutions for emergency services and authorities
- **Cyber-security for modern energy systems**
 Cyber-security for critical infrastructure such as distribution networks with decentralised renewable energy sources
- **Secure system architectures**
 Accompaniment of software development processes regarding security

Advanced Network Mapping - Software tools to increase cyber-defence capability such as the network analysis tool developed in-house permit the inclusion of configurable analysis modules in an easy-to-modify process. The tool combines the results of automated analysis processes, displays an overview of the network and supports the security auditing process.





Connected Computing

We revolutionise the access and networking of information and media in complex, networked application environments on the basis of new software architectures and technologies.

The research group is an integral component at the very core of DIGITAL's activities with research focussed on data analysis – insights gained from data and media, cloud and service-based software architecture, Internet of Things, information management and the accessibility of information.

Information Management

Modern software solutions for the production and administration of information, particularly for the preservation of cultural heritage.

Industrial Internet

Process optimisation via the analysis of sensor data streams from the Internet of Things.

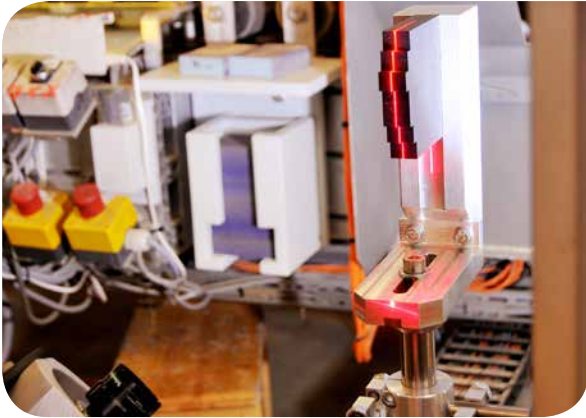
Smart Media

Intelligent media monitoring and development of new media forms arising from the merging of radio broadcasting and internet.

VidiCert automates the time and cost intensive process of visual quality assessment for film and video content. The result is the fully automatic recognition of picture noise, severe video distortion and blank or out-of-focus images.

DeSSnet – Dependable, secure and time-aware sensor networks

The use of highly developed sensor networks is a prerequisite for the digital transformation of industry to control complex processes. The aim of the K-project DeSSnet is to create innovative sensor networks using wireless communication for data analysis considering factors such as security, reliability, interoperability, and efficiency in terms of cost and energy



Machine Vision Applications

We develop contactless machine vision methods for measurement and navigation and for inspection of work pieces and materials in production processes.

A wide range of machine vision technologies is used for applications in industrial inspection and metrology, human-centred image analysis, and robotics. Two- and multi-dimensional measuring tasks are implemented with the aid of imaging sensors, an information processing system to execute the necessary algorithms, and an integrated mechatronic set-up.

- Industrial inspection
- Human-centred image analysis
- Robotics & 3D Visions

Registration of deformable bodies:

The use of radiation for medical therapy and diagnostics must be as precise as possible. Due to the deformability of the human body, research focuses on the exact registration of volumetric data so that experts can react to changes. One initial application of our development is radiotherapy.

OCR based process monitoring in steelworks:

The increasing quality requirements to be met by steel products requires a high degree of quality inspection and end-to-end process monitoring. The system based on optical character recognition (OCR) allows identification of steel billets based on the embossed numbers even in harsh industrial environments.



Intelligent Acoustic Solutions

We do research in the fields of acoustic monitoring, vibrations, audio and multimedia. We have a broad scientific base and a wide range of expertise required for developing a holistic system in real-life conditions. This ability to create holistic systems enables system developments from the initial idea to research projects at various stages and the fully functioning system.

- **Acoustic Monitoring**
Road tunnel, industry and production
- **Innovative Future Acoustic User Interfaces**
Speech- and audio communication for industry and robotics
- **Expert Listening Panel**
Listening laboratory analyses
- **From a Concept to a Fully Functional System**
Oscillations, Audio and Multimedia

Expert Listening Panel: Evaluation and assessing the acoustic properties of technical products has become an increasingly important factor in recent years. This has also increased the industry's need for standardisation of such test series. We offer according to international standards the best-equipped listening laboratory in Austria, trained and professional listeners ("Expert Listeners") as well as the design and the performance of the test procedures.





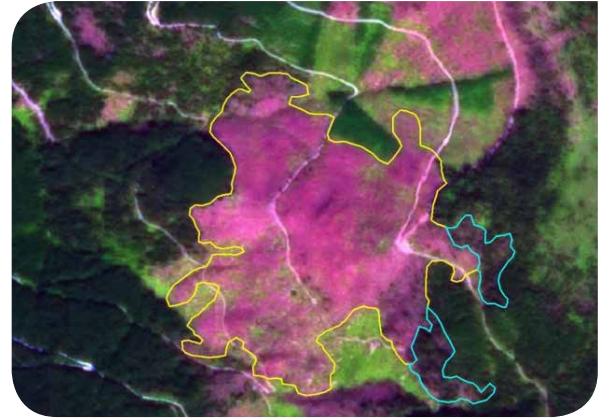
Space and Communication Technology

For decades, we have been excelling in satellite communication, electromagnetic wave propagation, and space flight experiments. Our skills range from developing innovative modern solutions for satellite radio, developing and manufacturing prototypes for experiments suitable for space flight, to studies and small series for ESA, NASA and many other clients and project partners.

- Satellite and terrestrial broadband communication
- Radar technology, navigation & wave propagation
- Development of space-qualified hardware and software

2D-Video-Distrometer: Reliable models of the fine structure of precipitation are the precondition for a wide range of applications in telecommunications, remote sensing or meteorology. With extensive evaluation options, the high-precision equipment for measuring precipitation particles, in use all over the world, provides the basis for precise statements about the effects of the various types of precipitation on satellite radio paths.





Remote Sensing and Geoinformation

Our activities include development of methods for pre-processing and analysing optical, SAR and LIDAR data, development of geographical information and management systems, and wearable multisensor systems for real-time applications based on innovative mobile user interfaces.

- **Geometric image processing**
 Geocoding, photogrammetry, interferometry
- **Environmental monitoring**
 Alps, forest and land use
- **Near-real-time decision support**
 Air-assisted disaster monitoring, crisis management, data fusion
- **Wearable assistance systems**
 Context and activity detection, head and body-mounted systems

Airborne platform: ADAM (Airborne Data Acquisition Module) offers a flexible and inexpensive solution for taking aerial photographs with a high resolution, LIDAR-data and thermal data. Detailed orthographic images, image mosaics or 3D surface models can be derived with the aid of the associated software. Fast downlink technology allows near-real-time evaluation of data.



Infrastructure – Products – Solutions

- Listening Room
- Distrometer
- Image Processing Laboratory
- CUDA Research Center
- Sensor Platform
- Human Factors Lab
- Space Technology Lab
- Communication Technology Lab
- RFID Lab
- Acoustic Tunnel Monitoring AKUT
- BrandDetector
- vislvis
Camera-based Visibility Measurement
- Modern Collection Management with *imdas pro*
and *archivis pro*
- Comprehensive Edge Control for Furniture and
Doors
- VidiCert – Efficient Quality Assessment for Video
and Film
- Monitoring of Wrong-way Driving and Car Parks
- Digital Image Measurement System in Tunnel
Construction
- Automatic Evaluation of Polished Sections
- OCR-based Process Monitoring in Steelworks
- High-precision, Real-time-enabled 2D Position
Sensor
- Registration of Deformable Bodies
- ESA ExoMars Rover 2018 PanCam 3D Vision
- Graffiti Buster



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