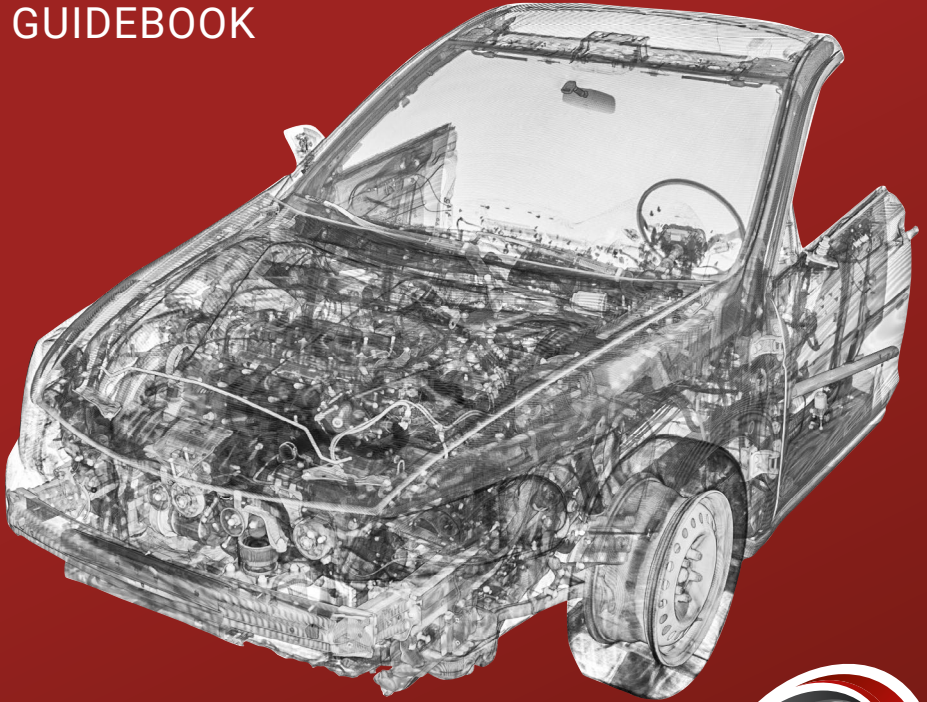PROGRAM
& GUIDEBOOK

iCT CONFERENCE 2023

12th CONFERENCE ON INDUSTRIAL COMPUTED TOMOGRAPHY

February 27 - March 2

FÜRTH, GERMANY

www.iis.fraunhofer.de/ict23

Co-Organizer

UNIVERSITY
OF APPLIED SCIENCES
UPPER AUSTRIA

NDT*net*

Fraunhofer
IIS

Welcomce to the 12th iCT Conference

The relevance of industrial X-ray computed tomography (CT) is continuously increasing, mainly due to its advantages in the non-destructive testing (NDT) of materials and components. In contrast to most other NDT methods, CT provides a three-dimensional digital twin of a component including its internal structure. This in turn facilitates the detection of internal structures and defects, including pores, cracks, or impurities, making CT an essential tool in many NDT applications.

Even after decades of progress in the advancement of industrial CT systems, new products, methods, and applications are constantly developed. The industry and scientific presentations during the iCT Conference 2023 will give insight into the latest developments as well as established methods.
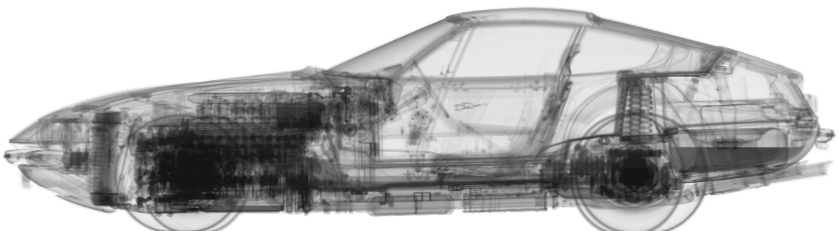
Topics

- Non-destructive Testing

- 3D Materials Characterization

- Dimensional Measurement

- Industry Cases

- Evaluation of CT data

- Synchrotron CT methods

PROGRAM OVERVIEW

Monday, February 27, 2023, Industry Day

01:00 pm	Welcome to Industry Day
01:05 pm	Talks by sponsors
05:30 pm	Bus Transfer to EZRT & CT Lab Tours

Tuesday, February 28, 2023

08:00 am	Registration
08:30 am	Welcome and introduction, Norman Uhlmann and Stefan Kasperl, Fraunhofer IIS
08:40 am	Keynote I: Trends in CT for Materials Characterization and Additive Manufacturing
09:10 am	Evaluation and visualization of CT data
10:30 am	Break
11:00 am	Materials characterization
12:40 pm	Lunch
01:40 pm	Deep Learning 1
03:00 pm	Break
03:30 pm	Deep Learning 2
04:20 pm	Poster short talks
06:25 pm	Poster Exhibition

Wednesday, March 1, 2023

08:00 am	Registration
08:30 am	Keynote II: Far beyond conventional imaging: Multiscale X-ray tomography at The European Synchrotron
09:00 am	Reconstruction & Algorithms and Optimization
10:20 am	Break
10:50 am	Image processing
12:10 pm	Lunch
01:10 pm	Instrumentation & Phase Contrast and grating interferometer 1
02:30 pm	Break
03:00 pm	Instrumentation & Phase Contrast and grating interferometer 2
04:00 pm	Break
04:30 pm	Multi-modal and Multi-energy
05:20 pm	Bus Transfer & Conference dinner

Thursday, March 2, 2023

08:00 am	Registration
08:30 am	Keynote III: Fast, autonomous, traceable, and integrated: the X-CTing journey towards X-ray CT based Industry 4.0 process chains
09:00 am	Metrology
10:20 am	Break
10:50 am	Non-Destructive Testing
12:10 pm	Award Ceremony, Closing, ICT2024 Preview and Lunch

Conference Agenda

INDUSTRY DAY, MONDAY FEBRUARY 27, 2023

01:00 pm – 01:05 pm	Welcome to Industry Day
01:05 pm – 02:30 pm	**Talks by Sponsors (Gold)**
	Chair: Thomas Lang,
	Fraunhofer IIS, Division Development Center X-ray Technology
	Chair: Stefan Kasperl,
	Fraunhofer IIS, Division Development Center X-ray Technology
	Heitec PTS, TBA
	IPDSK Explorer use case: original image processing approach to exploit CT scans with strong artifacts
	Joseph Baptista, Reactiv'IP
	VisiConsult, TBA
	CT data processing using X-AID
	Marian Willner, MITOS
	Excillum, TBA
	Comet Yxlon, TBA
	Innovations for better CT quality hat higher inspection throughput
	Oliver Brunke, Baker Hughes Digital Solutions Waygate Technologies
	Nikon, TBA
02:30 pm – 03:00 pm	Break
03:00 pm – 04:30 pm	**Talks by Sponsors (Silver)**
	Rigaku, TBA
	State of the art on CT data processing
	Sven Gondrom-Linke, VolumeGraphics
	Benefits of a reliable motion partner
	Koen Schoofs, LAB Motion Systems

Phase contrast tomography with Exciscope

Chris Celania, Exciscope

VAREX Imaging, TBA

RX Solutions, powerful and versatile X-ray CT systems, RX Solutions TBA

FEI ThermoFisher, TBA

XPLORATION GmbH - research as a service, XPLORAYTION, TBA

The heel effect of microfocus reflection target tubes

Jens Peter Steffen, X-RAY WorX

Object Research Systems (ORS), TBA

Bruker, TBA

New dimensions in micro-CT imaging using TESCAN Spectral CT

Wesley de Boever, TESCAN

Schneider Digital, TBA

04:30 pm – 05:30 pm	Exhibition and Networking
05:30 pm	Bus Transfer to EZRT and CT Lab Tours

TUESDAY FEBRUARY 28, 2023

08:00 am – 08:30 am	Registration
08:30 am – 08:40 am	Welcome and introduction, Norman Uhlmann and Stefan Kasperl, Fraunhofer IIS, Division Development Center X-ray Technology
08:40 am – 09:10 am	**Keynote I: Trends in CT for Materials Characterization and Additive Manufacturing**, Johann Kastner, FHOOE, AT Chair: James F. Hunter, Los Alamos National Lab Chair: Florian Wohlgemuth, HEITEC PTS GmbH
09:10 am – 10:30 am	**Evaluation and visualization of CT data** Chair: James F. Hunter, Los Alamos National Lab Chair: Florian Wohlgemuth, HEITEC PTS GmbH

NDTFlix: Collaborative Remote Analysis of X-ray Computed Tomography Datasets

Patrick Weinberger, University of Applied Sciences Upper Austria

Evaluation of XCT image quality

Anne-Françoise Obaton, Laboratoire national de métrologie et d'essais (LNE)

Design and implementation of a flexible mobile CT-System as a Service

Markus Eberhorn, Fraunhofer IIS, Division Development Center X-ray Technology

TUESDAY FEBRUARY 28, 2023

Simulated and experimental evaluation of the accuracy of twin robotic CT systems

Anton Weiss, Technische Hochschule Deggendorf, Germany

10:30 am – 11:00 am	Break

11:00 am – 12:40 pm	**Materials characterization**

Chair: Markus Sause, Universität Augsburg

Chair: Johann Kastner, FH Oberösterreich

3d imaging and analysis of cracks in loaded concrete samples

Christian Jung, Rheinland-Pfälzische Technische Universität Kaiserslautern-Landau

Ex- and in-situ tests of materials: From design to materials parameters via motion estimation

Tessa Nogatz, Rheinland-Pfälzische Technische Universität Kaiserslautern-Landau

X-ray tomography study of "squeezed pores" in additively manufactured titanium alloy subjected to hot isostatic pressing

Anton du Plessis, Object Research Systems, Montreal, Canada

Stellenbosch University, South Africa

Applications of NanoCT Analysis with the ntCT System for Materials Research and Defect Investigation in Semiconductors

Dominik Müller, Fraunhofer IIS, Division Development Center X-ray Technology

Correlative lab-based Nano-CT and 360°-ET of hierarchical porous materials for catalysis and nanoparticle chromatography applications

Alexander Götz, Institute of Micro- and Nanostructure Research (IMN) and Center for Nanoanalysis and Electron Microscopy (CENEM)

12:40 pm – 01:40 pm	Lunch

01:40 pm – 03:00 pm	**Deep Learning 1**

Chair: Guillermo Requena, DLR

Chair: Tessa Nogatz, Rheinland-Pfälzische Technische Universität Kaiserslautern-Landau

Defect detectability analysis via Probability of defect detection between traditional and deep learning methods in numerical simulations

Miroslav Yosifov, University of Applied Sciences Upper Austria, Campus Wels, Austria

imec-Vision Lab, Dept. of Physics, University of Antwerp, Belgium

Porosity Prediction in Selective Laser Melting Combining Photodiode-based In-Process Monitoring and X-CT

Zhengrui Tao, KU Leuven, Department of Mechanical Engineering, Belgium

Deep Learning Based Scatter Estimation

Markus Michen, Fraunhofer IIS, Division Development Center X-ray Technology

Automated defect recognition in X-ray projections using neural networks trained on simulated and real-world data

Tobias Schön, Fraunhofer IIS, Division Development Center X-ray Technology

03:00 pm – 03:30 pm	Break

03:30 pm – 04:10 pm

Deep Learning 2

Chair: Christoph Heinzl, University of Passau
Chair: Christopher Syben, Fraunhofer IIS, Division Development Center X-Ray Technology

X-Ray Scatter Correction by Deep Semi-supervised Learning of Simulated Projections with Beam-hole Array

Haruki Hattori, The University of Tokyo, Japan

Novi-Sim: A fast X-ray tomography simulation software for laboratory and synchrotron systems to generate training databases for deep learning applications

Awen Autret, Novitom, France

04:20 pm – 06:25 pm

Poster short talks

Chair: Simon Zabler, Fraunhofer IIS, Division Development Center X-ray Technology
Chair: Valérie Kaftandjian, INSA-Lyon

A Demonstrator for Threat Detection in Volumetric CT Scans

Thomas Lang, FORWISS, University of Passau; Fraunhofer IIS, Division Development Center X-ray Technology

A machine learning supported sinogram interpolation method for X-ray computed tomography

Simon Bellens, Materialise NV, Technologielaan 15,
Dept. of Mechanical Engineering, KU Leuven, Belgium

RoboCT - Robot based Computed Tomography for a Glider Plane

Wolfgang Holub, Fraunhofer IIS, Division Development Center X-ray Technology

Parametric optimization of TIG welding of low alloy steel structures by comparison of microstructure and CT analysis

Asif Butt, ACES, Pakistan

N-Dimensional Image Encoding on Quantum Computers

Thomas Lang, Fraunhofer IIS, Division Development Center X-ray Technology

Introduction to "Realistic Simulation of real CT systems with a basic-qualified Simulation Software - CTSimU2"

Tamara Reuter, Chair of Manufacturing Metrology, FAU, Erlangen, Germany

Keep Attention to the Mapping:Application of AI for Geometric X-Ray CT Scan Calibration

Simon Wittl, Technische Hochschule Deggendorf, Germany

Learning-based Trajectory Optimization for a Twin Robotic CT System

Linda-Sophie Schneider, Pattern Recognition Lab, FAU, Erlangen,
Fraunhofer IIS, Division Development Center X-ray Technology

Single Shot X-ray Speckle Tracking Phase Contrast Imaging with a Low Brilliance Lab Source

Peter Gänz, University of Stuttgart, Germany

Adapting an XCT-scanner to enable edge illumination X-ray phase contrast imaging

Ben Huyge, imec-Vision Lab, University of Antwerp, Belgium

Total Variation regularized reconstruction for enhancing the quality of few-view industrial computed tomography applied to image analysis and metrology

Maryam Bahrkazemi, Volume Graphics GmbH, Germany; KU Leuven, Leuven, Belgium

Economic and Environmental foot print reduction of CT

Gerd-Hendrik Greiwe, XRAY-LAB GmbH & Co. KG, Germany

Usage of 3D U-net Convolutional Neural Network for the inspection of aerospace components

Miroslav Yosifov, University of Applied Sciences Upper Austria

Ring Artifacts Removal & Noise Reduction in X-Ray Computed Tomography Using Deep Learning

Barbara Fayard, Novitom, France

Three Step Volumetric Segmentation for Automated Shoe Fitting

Martin Leipert, Pattern Recognition Lab, Erlangen; Deggendorf Institute of Technology, Germany

Stratigraphy of Late Gothic panel painting based on its virtual flattening

Daniel Vavřík, ITAM CAS, Czech Republic

High Energy CT applications for cultural heritage

Michael Böhnel, Fraunhofer IIS, Division Development Center X-ray Technology

X-ray Computed Tomography for Nuclear Power Plant Maintenance

Nick Brierley, diondo GmbH, Germany

Achieving Production Level Computed Tomography Inspection at Los Alamos National Laboratory

Joseph Hashem, Los Alamos National Laboratory, USA

AI-Powered Multi-Class Defect Segmentation in Industrial CT Data

Tim Schanz, Hochschule Karlsruhe - University of Applied Sciences, (IAF), Germany

Poster Exhibition

A new surface treatment method for simplifying and enhancing the segmentation of open space pore object
Miryana Raykovska, Institute for Information and Communication Technologies, Bulgarian Academy of Sciences, Bulgaria

Canny-Net: Known Operator Learning for Edge Detection
Julian Wittmann, Technische Hochschule Deggendorf, Germany

Geometrical Self-Calibration of CBCT Systems
Seyed Roohollah Hosseini, Arman Moj Fanavar Co.,
Department of physics, Sharif university of technology, Iran

Geometry Calibration Correction for Truncated Detector CT
Markus Wedekind, Technische Universität Braunschweig,
Carl Zeiss GOM Metrology GmbH Germany

Image Enhancement in Lens-Coupled Detectors for industrial CT systems
Seyed Roohollah Hosseini, Arman Moj Fanavar Co.,
Department of physics, Sharif university of technology, Iran

Virtual CT with aRTist
Carsten Bellon, Bundesanstalt für Materialforschung und -prüfung (BAM), Germany

Non-destructive evaluation of patient-specific, additively manufactured titanium foot implants using microcomputed tomography
Martin Holzleitner, University Of Applied Sciences Upper Austria

MIST – Mechanical In-situ Stage with Temperature control for X-ray computed tomography
Julia Maurer, Research Group Computed Tomography, University of Applied Sciences Upper Austria

A study of off-focal radiation in transmission geometry x-ray sources
Klara Steklova, Australian National University, Australia

Assessing defects detectability and 3D measurement accuracy in µCT data using X-ray simulation
Guillaume Bravais, Novitom SAS, France

The application of region specific measurement confidence in X-ray Computed Tomography (CT) for the Non-Destructive Evaluation (NDE) of metallic powders and parts
Peter Westenberger, Thermo Fisher Scientific, Germany

Wire Arc Additive Manufacturing (WAAM) and microstructural analysis of Magnesium parts
Sascha Senck, University of Applied Sciences Upper Austria, Austria

WEDNESDAY MARCH 1, 2023

08:00 am – 08:30 am	Registration
08:30 am – 09:00 am	**Keynote II: Far beyond conventional imaging: Multiscale X-ray tomography at The European Synchrotron,** Elodie Boller, ESRF, FR Chair: Kilian Dremel, Fraunhofer IIS, Division Development Center X-ray Technology Chair: Marius Costin, CEA LIST
09:00 am – 10:20 am	**Reconstruction & Algorithms and Optimization** Chair: Kilian Dremel, Fraunhofer IIS, Division Development Center X-ray Technology Chair: Marius Costin, CEA LIST
	Best projections selection algorithm based on constrained QDEIM for sparse-views X-ray Computed Tomography Victor Bussy, Université Paris-Saclay, France
	Automated Trajectory Generation for Region of Interest Computed Tomography using Industrial Robots Katharina Bliedtner, VisiConsult X-ray Systems & Solutions GmbH, Germany
	Interactive Denoising of 3D Volumes Using Wavelets Thomas Lang, Fraunhofer IIS, Division Development Center X-ray Technology
	Constrained Deep Learning Methods Generalize Better Christopher Syben, Fraunhofer IIS, Division Development Center X-ray Technology
10:20 am – 10:50 am	Break
10:50 am – 12:10 pm	**Image processing** Chair: Giovanni Bruno, BAM, Bundesanstalt für Materialforschung und -prüfung Chair: Wolfgang Holub, Fraunhofer IIS, Division Development Center X-ray Technology
	Automated 3D Defect Detection based on Simulated Reference Frank Sukowski, Fraunhofer IIS, Division Development Center X-ray Technology
	Toward denoising of 3D CT scans with few data Zhihua Liang, University of Antwerp, Belgium
	Thickness-Driven Sheet Metal Segmentation of CT-Scanned Body-in-White Yutaka Ohtake, The University of Tokyo, Japan
	Denoising, Deblurring and Automatic Segmentation of XCT Data with Deep Learning and Synthetic XCT Training Data. A Case Study on Al-Si MMCs. Athanasios Tsamos, Bundesanstalt für Materialforschung und -prüfung (BAM), Germany
12:10 pm – 01:10 pm	Lunch

01:10 pm – 02:30 pm	**Instrumentation & Phase Contrast and grating interferometer**
	Chair: Jan De Beenhouwer, University of Antwerp
	Chair: Sascha Senck, University of Applied Sciences Upper Austria

Energy dispersive x-ray CT using a fixed gantry design for material classification in aviation security x-ray screening
Steffen Sloth, DTU, Denmark

Validation of an easy-to-use beam-hardening measurement method
Fabrício Borges de Oliveira, Physikalisch-Technische Bundesanstalt (PTB), Germany

Advancing research and education with simple setup Talbot-Lau-Interferometers
Josephine Gutekunst, microworks GmbH, Germany

Angular X-ray transmission measurements of gold absorption gratings: comparison of different laboratory X-ray sources
Gideon Chinamatira, University of the Witwatersrand, South Africa

| 02:30 pm – 03:00 pm | Break |

03:00 pm – 04:00 pm	**Instrumentation & Phase Contrast and grating interferometer**
	Chair: Wim Dewulf, KU Leuven R&D
	Chair: Daniel Vavřík, ITAM CAS

Computed tomography with or without radiation
Virginia Voland-Salamon,
Fraunhofer IIS, Division Development Center X-ray Technology

Multiscale Phase-Contrast Tomography at BM18
Simon Zabler, Fraunhofer IIS, Division Development Center X-ray Technology

Development of energy-dispersive diffraction and grayscale quantification in polychromatic synchrotron tomography
Alan Leonard Kastengren, Argonne National Laboratory, United States of America

| 04:00 pm – 04:30 pm | Break |

04:30 pm – 05:10 pm	**Multi-modal and Multi-energy**
	Chair: Robert Zboray, Empa; Chair: Norman Uhlmann,
	Fraunhofer IIS, Division Development Center X-ray Technology

Application of multispectral computed tomography for the characterisation of natural graphite
Natalia Grozmani, WZL | RWTH Aachen University, Germany

Single sided 3D imaging with RadalyX robotic X-ray scanner
Josef Uher, Radalytica a.s., Czech Republic

| 05:10 pm – 11:00 pm | Bus Transfer & Conference dinner |

THURSDAY MARCH 2, 2023

08:00 am – 08:30 am	Registration
08:30 am – 09:00 am	**Keynote III: Fast, autonomous, traceable, and integrated: the X-CTing journey towards X-ray CT based Industry 4.0 process chains,** Wim Dewulf, KU Leuven, BE Chair: Simone Carmignato, University of Padova Chair: Stefan Kasperl, Fraunhofer-Institut für Integrierte Schaltungen IIS, Division Development Center X-ray Technology
09:00 am – 10:20 am	**Metrology** Chair: Simone Carmignato, University of Padova Chair: Stefan Kasperl, Fraunhofer-Institut für Integrierte Schaltungen IIS, Division Development Center X-ray Technology
	On the use of X-ray computed tomography for the improvement of metal laser powder bed fusion process monitoring Nicolò Bonato, University of Padova, Italy
	CT-based dimensional metrology developments in Brazil: Current status and outlook Thiago Linhares Fernandes, UNIPD Università di Padova, Italy
	CT scan trajectory calibration based on projected metal spheres: When and how should errors from elliptical distortion be corrected? Lorenz Butzhammer, FAU, Chair of Manufacturing Metrology (FMT), Germany
	A contribution to the debate on measurement uncertainty when using X-ray computing tomography Ahmed Salah, The University of Huddersfield, United Kingdom
10:20 am – 10:50 am	Break
10:50 am – 12:10 pm	**Non-Destructive Testing** Chair: Anton du Plessis, Object Research Systems Chair: Jan Sijbers, University of Antwerp
	Workflows for assessing electronic devices with 3D X-ray microscopy and nanoscale computed tomography Herminso Villarraga-Gomez, ZEISS, United States of America
	Performance parameters for evaluating pore detection ability of computed tomography systems Katja Höger, wbk Institute of Production Science, Karlsruhe Institute of Technology (KIT), Germany
	Multi-Source-CT for inline inspection of extruded profiles Simon Rettenberger, Fraunhofer IIS, Division Development Center X-ray Technology
	Automation of Non-Destructive Evaluation of Casting Parts based on Computed Tomography and Machine Learning Barbara Fayard, Novitom, France

	Mobile CT and cloud service makes CT inspection fast and affordable
	Robin Höhne, Microvista GmbH, Germany

12:10 pm – 12:20 pm	Award Ceremony, Closing, ICT2024 Preview and Lunch

SOCIAL PROGRAM

CT Lab Tour at Fraunhofer-Development Center X-ray Technology
Monday, 2-27-2023, 5.30 pm – 9.00 pm

After the exhibition, a bus will take you to Fraunhofer EZRT, where we invite you to visit our laboratories and encounter cutting-edge research made in Germany. Among other things, we will open the largest publicly accessible X-ray facility in the world for you. Our scientists are looking forward to an exciting and informative exchange with you. Together, we will end the day enjoying snacks and cold drinks.

Poster Exhibition
Tuesday, 2-28-2023 6.30 pm – 9.00 pm

Enjoy excellent regional specialties and drinks while networking at the Stadthalle Fürth.

Conference Dinner
Wednesday, 3-1-2023, 5.30 pm – 11.00 pm

For the conference dinner we will travel to the nearby city of Nürnberg. Our bus will stop next to the famous Imperial Castle, from where you have the opportunity to enjoy guided tours to the old town of Nürnberg.
The tours will end at the town hall in the heart of the city. Our conference dinner will take place in the magnificent historic city council chamber of the town hall.
In the striking atmosphere of renaissance architecture of the chamber you will enjoy specialties of the Franconian as well as international cuisine.
Another highlight of the evening will be the performance of the Capella Antiqua Bambergensis who will take you to a musical journey back to the Middle Ages.
Let yourself be surprised!

Partners
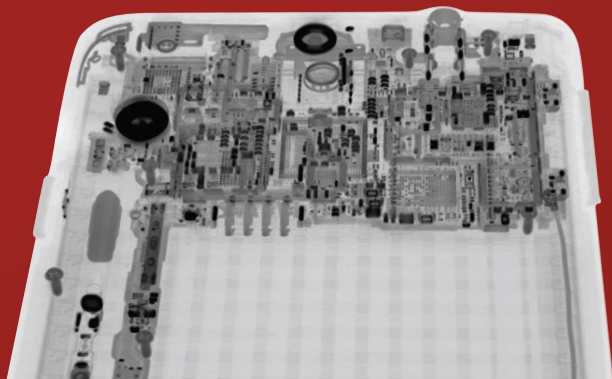
Gold Partners

excillum

Waygate
Technologies

diondo
x-ray systems and services

Reactiv'IP
SMART IMAGE PROCESSING

VCxray
by VisiConsult

HEITEC
engineering solutions

comet
yxlon

MITOS

NDTnet

Nikon

Silver Partners

Important Information

CONTACT
Organizing Team

Phone: +49 911 58061-7511
E-mail: info@ict2023.org

Pictures:
Pictures and videos will be taken during the event.
We point out that these pictures and videos may be published.

Venue
The conference will be held at the Stadthalle Fürth – Rosenstraße 50 in 90762 Fürth.

Wifi
Wifi is available free of charge during the conference.

Parking
The nearest parking facility is the parking garage of the Stadthalle Fürth. The parking fees are included in the conference fee. Please have your parking ticket validated by the service staff.

Currency and Banking
The official currency of Germany is Euro (EUR, €). Therewith, Germany belongs to the 20 European countries that use the common European money.

ATM
You may find ATMs within a bank or right outside of the bank building. Entering a bank during closing hours is usually possible with bank cards with a chip. ATMs closest to the congress area:
- Sparkasse Fürth, Königstraße 42, 90762 Fürth
- Targobank, Schwabacher Str. 40-42, 90762 Fürth
- Deutsche Bank, Schwabacher Str. 32, 90762 Fürth

Power and Electrical Plugs
Electricity is 220-230V, 50 Hz. - German plugs have two round pins.

©Stadthalle Fürth

Emergency Numbers
German Police: 110 | German Fire Department and Ambulance: 112

Climate and Clothing
February in Germany/Bavaria is one of the coldest months of the year. Usually we have less than 0°C/32°F During the day it may rain, in the night it may freeze. Often it is snowing. So don´t forget to bring warm clothing, winter jackets and boots.

Store Opening Hours
The opening hours of shops vary in Germany. Mostly though, the opening hours during the week are Monday - Saturday, from 09:00 am - 08:00 pm.

Smoking
No smoking in public buildings (e.g. airports, train stations, schools, universities, government administration buildings) and on public transport (e.g. trains). At the conference venue you may smoke outside of the building.

Pharmacies in Fürth
Altstadt-Apotheke, Geleitsgasse 6, 90762 Fürth | Phone: +49 (0) 911779682
Open: Mon-Fri: 08:30 am to 06:30 pm, Sat 09:00 am to 12:30pm
Apotheke im Forum, Bahnhofplatz 6, 90762 Fürth | +49 (0) 91150720130
Open: Mon-Fri: 08:30 am to 06:30 pm, Sat closed

Attractions in Fürth/Nuremberg
Should you be intersted in seeing touristic sights please visit the following websites for more information: **www.tourismus-fuerth.com/**
www.tourismus.nuernberg.de/en/

How to find
the Stadthalle Fürth

... by car

Approach from motorway A3
Taking the exit „Kreuz Fürth/Erlangen" change to motorway A73 and continue to exit "Fürth-Poppenreuth" in the direction of the city center ("Stadtmitte"), from there follow the signs to "Stadthalle **P**".

Approach from motorway A6
Taking the exit "Kreuz Nürnberg Süd" change to motorway A73 via "Kreuz Nürnberg-Hafen" to exit "Fürth Süd", turn into the street "Schwabacher Straße" in the direction of the city center, from there follow the signs to "Stadthalle **P**".

Approach from motorway A9
Taking the exit „Dreieck Nürnberg/Feucht" change to motorway A73 via "Kreuz Nürn-berg-Hafen" to exit "Fürth Süd", turn into the street "Schwabacher Straße" in the direction of the city center, from there follow the signs to "Stadthalle **P**".

... by public transport

Arriving at Fürth main station or Nürnberg main station take subway U1 in the direction "Fürth Hardhöhe" to station "Stadthalle".

From Nürnberg Airport take subway U2 heading for "Röthenbach". At station "Plärrer" change to subway U1 in the direction "Fürth Hardhöhe" to station "Stadthalle".

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