

HTW Chur

Hochschule für Technik und Wirtschaft
University of Applied Sciences



Image Processing, Augmented and Virtual Reality

HTW Chur, Tuesday, 28. May 2019



Prof. Dr. Bruno Studer

Prof. Dr. dipl. El. Ing., Member of the Executive Board, HTW Chur, 7004 Chur GR
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Dr. Bruno Studer received the ETH Diploma in 1987 and a PhD in Computer Science in 1994 from the University of Zurich. Since 2001 he is a professor for Computer Science and since 2007 responsible (Chairman) for the Department of Applied Future Technologies which includes several study programs and research activities in the field of Photonics, ICT, Information Science, Digital Business Management, Data Science and Multimedia Production.

Welcome to the HTW



Dr. Christoph S. Harder

President Swissphotonics NTN, 8832 Wollerau SZ
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Dr. Christoph S. Harder received the ETH Diploma in 1979 and the Master and PhD in EE in 1980 and 1983 from Caltech, Pasadena, USA. He is cofounder of the IBM Zurich Laser Diode Enterprise which pioneered the first 980nm high power pump laser for telecom optical amplifiers and laser diodes for industrial and consumer applications with ultrahigh reliability. He is the recipient of a Fulbright scholarship and the OSA Fellow recognition. Christoph is now heading a consulting company and is cofounder of Swissphotonics and has been its president for the last few years. He has published more than 100 papers and 20 patents and has held a variety of staff and management positions at ETH, Caltech, IBM, Uniphase, JDS Uniphase, Nortel and Bookham and has volunteered on society boards and committees.

Moderation



Reto Hidber

R & D project management, TRUMPF Schweiz AG, 7214 Grösch GR
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Basic education as an Electronics Technician, further education as a System Engineer specialization in Measurement and Control Technology, Test Engineer at Integrated Measurement Systems IMS (Sargans, Portland/Oregon), Development Engineer Firmware and Embedded System at Micropool GmbH (Bad Ragaz), since 2011 R&D Division Laser Marking Electronics Development and Project Manager Sensor Technology and Laser Systems at TRUMPF Schweiz AG.

Machine vision in industrial production

VisionLine is a TRUMPF in-house image processing solution for laser systems. VisionLine monitors and evaluates the state before, during and after the laser process. The VisionLine solution is a standard option for welding as well as marking lasers. In addition to classical image processing algorithms, deep learning algorithms are increasingly used for classification of quality of the parts.



Philipp Schmid

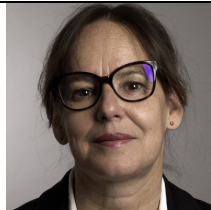
Head Robotics & Machine Learning, CSEM SA, 6055 Alpnach OW

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Philipp Schmid holds a degree in Microtechnology focused in robotics (Dipl. Ing. FH) and an MAS in Management, Technology and Economics from ETH. Before joining 2006 CSEM he worked at Roche and other companies. He spent one year as research fellow at the ICT Robotics group (CSIRO) in Australia. Now he manages the research, development and industrialization of new technologies for automation applications.

Deep Learning, Neural Networks into Production

Since more than 10 years is CSEM actively developing quality inspection algorithms based on Deep Neural Networks for industry. Despite great results and big hype around this new technology the path into managed production is stony and long. This talk focuses on latest results in the field and shows steps for a successful implementation in the shop floor.



Prof. Dr. Tanja Hess

Professor for Visualisation, HTW Chur, 7004 Chur GR

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Tanja Hess, Prof., Dipl. art and design (ZHdK) working at HTW Chur as a professor for visualisation in the department of applied future technologies at the institute for multimedia production. As an expert in digital design in 2d and 3d, with the focus in visual ideation and information architecture she develops scientific projects and applications.

Educational gamified reality: an example of drafting and rapid prototyping for the HoloLens

Starting from the idea to visualise the entry points of the harmful radioactive gaz radon in the building, we started to develop a HoloLens application. Radon is a fluid and natural radioactive gaz coming from the deep underground. Radon enters the building through cracks in the fundament, open surfaces like gravel in the cellar and wholes where pipes, wire and cables enter.



Dr. Zoltán Török

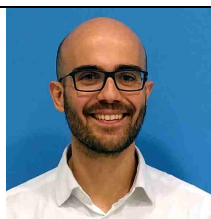
Chief Software Engineer, Leica Geosystems AG, 9435 Heerbrugg SG

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Zoltán Török graduated as electronic engineer in 2002 at the Budapest Polytechnic, Hungary. He received his master's degree in microsystems engineering from the Furtwangen University, Germany in 2004 and his PhD from the University of Central Lancashire, UK in 2007. In the same year he joined Leica Geosystems AG, and working currently as a chief engineer developing computer vision solutions for surveying instruments.

Visual inertial system for 3D laser scanner

Terrestrial laser scanners are nowadays widely used devices to capture the reality in 3D. The rapid development of the laser scanners posed a new problem. The devices allow users to record over 150 stations on a single working day. Registering these point clouds is tedious and time consuming. The visual inertial system of the Leica RTC360 solves this problem seamlessly by determining the poses of the stations.



Alessandro Giusti

Senior Researcher, The Swiss AI Lab IDSIA SUPSI, 6928 Manno TI

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Alessandro Giusti is a Senior Researcher at the Dalle Molle Institute for Artificial Intelligence IDSIA, affiliated with both SUPSI and Università della Svizzera italiana USI. He leads the robotics research group, and teaches Data Science, Robotics, Computer Vision and Deep Learning.

ML for perception and navigation in robotics

An overview of recent applications of Deep Learning and Augmented Reality in the field of microscopy (visualization of automated segmentation results in focus stacks), mobile robotics (perception of rough terrain traversability, drone control in human proximity and in forests) and manufacturing (optical measurement of material roughness).



Dr. Tobias Hövekamp

Manager Strategy Fund , AO Foundation, 8600 Dübendorf ZH
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Trained as an engineer at RWTH Aachen, Germany, Oregon State University, USA, and ETH Zurich, Tobias Hövekamp joined the AO Foundation more than 10 years ago. Since then, he held several education-related positions including Manager Surgery Reference and Manager Strategy Fund Projects. He is currently driving the development of a multipurpose virtual surgical simulator.

Virtual surgical simulation

The AO Foundation – a global network of 20,000 surgeon members offering over 800 educational events worldwide – has a long history in simulation-based education for treatment of trauma and disorders of the musculoskeletal system. With the advent of virtual reality (VR) new learning modalities become available. We will outline along the dimensions of VR (immersiveness, fidelity, etc.) our development activities and future potential.



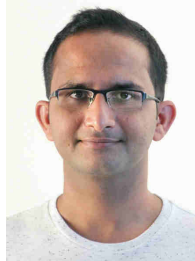
Dr. Udo Birk

Lecturer & Researcher, HTW Chur, 7004 Chur GR
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Udo Birk obtained his PhD in 2004 at the University of Heidelberg. As Marie Curie Fellow he developed optical imaging devices at King’s College, London, UK and at FORTH, Heraklion, Greece. He worked on tissue imaging and spectroscopy at Roche Diagnostics and at the Medical Laser Center Lübeck, and obtained his venia legendi in Experimental Physics from the University of Mainz in 2017. He is lecturer on Image Processing at HTW Chur University of Applied Sciences and in Physics at University of Mainz (Germany). His research focuses on image processing for various optical and acoustooptical imaging technologies, in particular on super-resolution imaging and on 3D optical tomography.

Face Recognition

Face identification has found numerous applications, among others, in mobile devices, animation and augmented reality, anti-terror, and forensics. We review challenges encountered in the application of face detection and identification, and illustrate some use cases for face recognition.



Dr. Danda Pani Paudel

Postdoctoral Researcher, ETH Computer Vision Laboratory, 8092 Zürich
paudel@vision.ee.ethz.ch | www.vision.ee.ethz.ch

Dr. Danda Pani Paudel is a postdoctoral researcher under Prof. Luc Van Gool in the Computer Vision Lab at ETH. His research interests include computer vision, optimization methods, and robotics. He is working in the field of vision-based 3D building modeling and video data manipulation. He received his PhD in 2015, from University of Bourgogne, France.

Current trends on Image Communication and Understanding

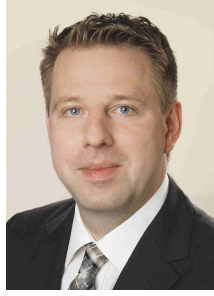
This talk presents the current research trends on image communication and understanding. The advancement in this domain has allowed us to use vision-based technology for diverse applications such as image enhancement, 3D modeling, and autonomous driving. Existing and the potential future products dedicated for these applications will be discussed.



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Panel Moderation

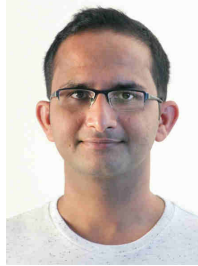


Dr. Klaus Albers

Head of Development, TRUMPF Schweiz AG, 7214 Grösch GR
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Dr. Klaus Albers is CTO of TRUMPF Schweiz AG. He received his PhD in Physics at the University of Hamburg and he has been working for almost a decade in the field of laser development and optics at TRUMPF.

Panelist



Dr. Danda Pani Paudel

Postdoctoral Researcher, ETH Computer Vision Laboratory, 8092 Zürich
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Panelist



Prof. Dr. Tobias Leutenegger

Head IPI, HTW Chur, 7004 Chur GR
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Tobias Leutenegger studied mechanical engineer and completed his dissertation in the field of wave propagation at the ETH. After 5 years at Bruker BioSpin, he worked at CEDES AG as development manager and member of the management board. Since 2014 he is at the HTW Chur as institute leader and program director of the BSc Photonics.

Panelist



Dr. Markus Rossi

Vice President Innovations, CIO ams AG, 8803 Rüschlikon ZH
markus.rossi@ams.com | www.ams.com

Studied physics at ETH, PhD in micro-optics from university Neuchâtel, started Heptagon as spin-off from CSEM Zurich in 2000. Jan 2017: acquisition of Heptagon by ams AG. Now Vice President Innovations.

Panelist

Our next stops:

Swissmem Photonics-Treff
Tuesday, 18. June 2019
Kägiswil OW

Photonic 4 intelligent processing
Wednesday, 19. June 2019
Palexpo Genève-Airport
EPHJ · EPMT · SMT

Apéro at Laser World of Photonics
Tuesday, 25. June 2019
Messe München



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Innosuisse – Schweizerische Agentur für Innovationsförderung