

Curriculum Vitae

Bernhard Rinner



April 12, 2018

Bernhard Rinner is full professor and chair of pervasive computing at Klagenfurt University (Austria).

He received both his PhD and MSc in Telematics from Graz University of Technology in 1996 and 1993, respectively. Before joining Klagenfurt University in 2007, he was affiliated with Graz University of Technology and held research positions at the Department of Computer Sciences at the University of Texas at Austin in 1995 and 1998/99. He was invited as visiting researcher at Princeton University in July 2006 and the University at Central Florida in May 2009, respectively. His current research interests include pervasive computing, sensor networks and multi-camera networks, embedded computing as well as embedded video and image processing. He has authored and co-authored more than 130 papers for journals, conferences and workshops, has led many research projects and has served as reviewer, program committee member, program chair and editor-in-chief.

Prof. Rinner has been co-founder and general chair of the ACM/IEEE International Conference on Distributed Smart Cameras and has served as chief editor of a special issue on this topic in the Proceedings of the IEEE and IEEE Computer. He is Associate Editor of the EURASIP Journal on Embedded Systems and Ad Hoc Networks and has served as Guest Editor for special issues in the IEEE Journal on Selected Topics in Signal Processing, the Elektrotechnik&Informationstechnik Journal and the EURASIP Journal on Embedded Systems. Together with partners from four European universities he has jointly initiated the Erasmus Mundus Joint Doctorate Program on Interactive and Cognitive Environments (ICE). Prof. Rinner has been co-chairing the IEEE International Conference on Advanced Video and Signal-Based Surveillance (AVSS) in 2011 and is a member of the AVSS steering committee since then. He is chair of the doctoral advisory board of the Faculty of Technical Sciences, an elected member of the Senate of Klagenfurt University and member of the board of the Austrian Science Fund. He is member of the IEEE, IFIP and TIV (Telematik Ingenieurverband).

1 Personal

Date and place of birth: December 7, 1967; Graz, Austria
Citizenship: Austrian
Marital status: married
Military service: October 1987 – May 1988 (service completed)

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2 Education

Habilitation

January 2002

Graz University of Technology, Austria

- graduated on January 28, 2002
- subject: "Rechnerarchitekturen und eingebettete Systeme" (computer architecture and embedded systems)
- habilitation thesis: "Monitoring and Diagnosis of Technical Systems"

Ph.D. in Telematics

December 1993 – June 1996

Graz University of Technology, Austria

- graduated on June 13, 1996 with highest honors
- advisor: Professor Reinhold Weiss
- dissertation title: "Design, Prototype Implementation and Experimental Evaluation of a Scalable Multiprocessor Architecture for Qualitative Simulation"

Master of Telematics

October 1988 – November 1993

Graz University of Technology, Austria

- graduated on November 25, 1993
- Telematics combines Electronics, Communications Engineering and Computer Science, lasts 5 years and leads to the degree "Dipl.-Ing."
- specialized in embedded parallel and distributed systems
- thesis title: "Konzepte zur Parallelisierung des qualitativen Simulators QSIM" (thesis in German)

High School Diploma

September 1982 – June 1987

HTBL u. VA Graz-Gösting, Austria (Technical High School)

- graduated on June 23, 1987 with highest honors
- high school with emphasis on Communications Engineering and Electronics

3 Professional Experience

Vice Dean of the Faculty of Technical Sciences Klagenfurt University, Austria	January 2008 – December 2011
Full Professor and Chair of Pervasive Computing (“Universitätsprofessor”) Klagenfurt University, Austria	March 2007 – present
Associate Professor (“Außerordentlicher Universitätsprofessor”) Graz University of Technology, Austria	March 2002 – February 2007
Research and Teaching Staff Member (“Universitäts-Assistent”) Institute for Technical Informatics, Graz University of Technology, Austria	March 1997 – February 2002
Visiting Researcher Department of Computer Sciences, University of Texas at Austin, USA	May 1998 – April 1999
Research Assistant Institute for Technical Informatics, Graz University of Technology, Austria	December 1993 – February 1997
Visiting Research Scholar Department of Computer Sciences, University of Texas at Austin, USA	July 1995 – August 1995
Internships AVL List GmbH – Medical Instruments, Graz, Austria	summers 1991-92, March 1993 – August 1993
Internships EBEWE GmbH Graz, Austria	summers 1989-90
Internships ORF, Austrian Broadcasting Company	summers 1985-86
Internships Kabel TV Graz, (cable television company), Austria	summers 1983-84

3.1 Professional Training

Didaktik 1 <i>Teaching at universities 1</i> ; 18 hours; Graz University of Technology, Feb 2002
Didaktik 2 <i>Teaching at universities 2</i> ; 18 hours; Graz University of Technology, June 2002
Didaktik 3 <i>Teaching at universities 3</i> ; 18 hours; Graz University of Technology, Feb 2003
Strategie- und Unternehmenskultur an der Fakultät für Technische Wissenschaften <i>Development of strategy and business culture at the Faculty of Technical Sciences</i> ; 72 hours; Klagenfurt University, 03/2007-09/2009
Gender-Kompetenz für universitäre Führungskräfte <i>Gender Competence for university leadership</i> ; 6 hours; Klagenfurt University, Feb 2009
Kommunikation und Feedback-Kultur <i>Communication and Feedback</i> ; 16 hours; Klagenfurt University, Feb 2010

3.2 Invited Research Visits

Princeton University, Department of Electrical Engineering. *joint research on distributed smart cameras*; invited by Prof. Wayne Wolf; July 2 – July 13, 2006

University of Central Florida, Department of Electrical Engineering and Computer Science. *joint research on UAV-based surveillance*; invited by Prof. Mubarak Shah; May 14 – May 24, 2009

National University of Singapore, Department of Computer Science. *joint research on security and privacy protection in sensor networks*; invited by Prof. Mohan Kankanhalli; April 11 – April 23, 2012

University of California at Riverside, Department of Electrical Engineering. *joint research on smart camera networks*; invited by Prof. Bir Bhanu; July 10 – July 24, 2012

4 Research Projects

4.1 International Doctoral School

ICE *Erasmus Mundus initiative; co-initiator & executive steering committee member; 2010 - 2017. www.icephd.org*

Five European universities have recently established an international doctoral school on **Interactive and Cognitive Environments (ICE)** within the Erasmus Mundus initiative of the European Commission. The ICE-consortium is comprised of the University of Genova (coordinator), UPC Barcelona, TU Eindhoven, Queen Mary University of London and Klagenfurt University. The Erasmus Mundus proposal has been accepted for funding in a highly competitive selection procedure. Among the currently funded 22 doctoral schools, ICE is the only program within the ICT field in Europe, and Klagenfurt is the only Austrian University participating in an Erasmus Mundus Joint Doctorate.

The ICE doctoral school has started in fall 2010 and is expected to run for at least seven years. The five universities deliver a joint PhD title. The European Commission funds 10 to 15 PhD positions each year—a fifth of these positions will be assigned to Klagenfurt. Each researcher obtains a three-year employment contract.

4.2 Ongoing Research Projects

Project activities include problem analysis, design, prototype implementation and evaluation as well as writing of proposals, organizing and leading project teams. The following research projects are funded by regional, national and European research grants, respectively.

Karl Popper Kolleg *Alpen-Adria-Universität Klagenfurt; 10/2017 - 9/2020; funding KLU: k€520*

The Karl Popper Kolleg (KPK) is a research and doctoral institute founded by Alpen-Adria-Universität Klagenfurt in 2014 fostering and strengthening international competitive research areas of AAU. For the college cycle 2017-2020 *Networked Autonomous Aerial Vehicles* has been selected as KPK's research area will receive funding for 4 PhD students and support for a post-doc and a guest professorship. The core faculty is comprised of Stephan Weiss (speaker), Christian Bettstetter, Hermann Hellwagner and Bernhard Rinner.

The KPK will significantly strengthen the university's recently defined area of excellence *Networked and Autonomous Systems* and also fits well into the multi-disciplinary research cluster *Self-Organizing Systems*. It bundles and leverages the research activities of the involved AAU groups and establishes—in combination with several researchers funded by other sources—a doctoral school of at least 12 students.

ComVis *Graz University of Technology, Austrian Institute of Technology, Federal Ministry of Science, Research and Economy; project partner; 7/2014 - 6/2019; funding KLU: k€200*

The focus of this strategic collaboration lies on computer vision within mobile scenarios, focusing on hardware-optimized techniques. In this way, complex computer vision and machine learning algorithms will be implemented in mobile devices such as smart phones, smart cameras, tablet PCs and similar hardware. These techniques will be used in camera networks for decentralized image processing. By focusing efforts in this way it will be possible both to pool existing expertise and to pursue a targeted course of development within a promising research area.

This strategic project is joint work with Graz University of Technology (TUG) and the Austrian Institute of Technology (AIT) and is supported by the Federal Ministry of Science, Research and Economy.

ProSecCo *Austrian Research Promotion Agency; project leader; 7/2014 - 7/2017; overall budget k€ 220; funding KLU: k€ 200*

ProSecCo explores the design of a secure, embedded surveillance camera architecture that advances the current state of the art in several ways. First, it provides confidentiality and non-repudiation as inherent features of the camera system. Second, it achieves secure intercamera cooperation with minimal involvement of centralized entities. Third, it uses modern, hybrid ARM/FPGA system on chip solutions to provide security and high speed image analysis functions.

This project is joint work with SLR Engineering GmbH (Graz) and the Multimedia Signal Processing group (EPFL) and is supported by the Austrian Research Promotion Fund (grant 842432).

4.3 Completed Research Projects

CROSMOS *Lakeside Labs; project leader; 1/2014 - 6/2015; overall budget k€ 364; funding KLU: k€ 285*

The CROSMOS project explores cooperative, multi-user apps and investigates methods for self-organization in technical and social environments. A key goal is to model, predict and influence the social interaction which is important on the one hand to improve our understanding of the social behavior in mixed-reality environments and on the other hand to improve the design and resource utilization of mobile apps.

This project is joint work with the Institute of Information Technology and the Institute of Media and Communication (all Klagenfurt University). It is supported by Lakeside Labs GmbH and funded by the European Regional Development Fund and the Carinthian Economic Promotion Fund (grant 20214/25557/37319).

SINUS *Lakeside Labs; project leader; 1/2013 - 6/2015; overall budget k€ 880; funding KLU: k€ 770*

The design of a self-organizing system of multiple, autonomous UAVs is founded on key building blocks for sensing, communication & networking and coordination. The SINUS project focuses on the integration of these blocks and their interaction to effectively close the sensing-networking-acting loop within the multi-UAV system. Such a tight integration is necessary for deploying self-organizing UAVs in dynamic and partly unknown environments.

This project is joint work with the Mobile Systems group and the Multimedia Communications group (all Klagenfurt University). It is supported by Lakeside Labs GmbH and funded by the European Regional Development Fund and the Carinthian Economic Promotion Fund (grant 20214/24272/36084).

TrustEYE *KWF/Austrian Science Fund; PI; 8/2012 - 7/2015; overall budget: k€ 388; funding KLU: k€ 314*

The TrustEYE project aims at establishing trust in resource-limited visual sensor networks by making security and privacy protection inherent properties of the image sensor unit. The key idea is to protect access to the sensor by a trustworthy sensing unit. The trust at the sensor level is expanded to the camera node and network level.

This project is performed in collaboration with the National University of Singapore.

ICE Booster *Lakeside Labs; PI; 1/2011 - 12/2014; overall budget: k€ 723; funding KLU: k€ 661*

The ICE Booster increases the momentum of the Erasmus Mundus doctoral school on "Interactive and Cognitive Environments (ICE)" especially in its starting phase by funding four additional PhD positions.

EPiCS *FP7 FET-IP (no. 257906); WP leader; 9/2010 - 8/2014; overall budget: M€ 6.67; funding KLU: k€ 497*

The EPiCS project aims at laying the foundation for engineering the novel class of proprioceptive computing systems. Proprioceptive computing systems collect and maintain information about their state and progress, which enables self-awareness by reasoning about their behavior, and self-expression by effectively and autonomously adapt their behavior to changing conditions. The Pervasive Computing group contributes research in the self-organization of visual sensor networks.

This project is joint work of eight partners—Univ. Paderborn (coordinator), Imperial College London, Univ. Oslo, Univ. Birmingham, EADS Munich, ETH Zurich, AIT Vienna and Klagenfurt University—and funded by the FP7-ICT Future Emerging Technologies (FET).

MobiTrick *FFG (no. 825840); co-PI; 7/2010 - 8/2013; overall budget: k€ 656; funding KLU: k€ 192*

The focus of the MobiTrick project is outdoor mobile computer vision with all of its challenges. Mobile systems need to be compact and energy efficient and are frequently changing locations. Therefore they must be autonomous

and perform processing locally. A number of challenges arise from these requirements for which the project aims to provide solutions: Being compact, there is not much space for a large number of sensors such as laser scanners, radar antennas and the like. The work in this project will focus on stereo vision but with two different types of cameras. Thus, the system must be designed to be very energy efficient. New approaches for dynamic power management will be explored in the project. To put the work into context, several applications from the area of traffic surveillance/toll enforcement will be implemented and tested in an application oriented setting.

This project is joint work with Graz University of Technology and EFKON AG Graz and is supported by Austrian Research Promotion Agency (FFG) via the FIT-IT [visual computing] program. The MobiTrick project received the award (3rd place) for the **best research proposal in the FIT-IT [visual computing] program line**.

cDrones *Lakeside Labs; project leader; 4/2008 - 12/2012; overall budget M€ 2.05; funding KLU: M€ 1.21*

This "Collaborative Microdrones (cDrones)" project develops a system for aerial sensing based on cooperating, wireless networked unmanned aerial vehicles (microdrones). Several microdrones fly in formation over the area of interest in a selforganizing manner and deliver high-quality sensor data such as images or videos. These images are fused on the ground, analyzed in real-time, and delivered to the user. The project performs original research in the areas (1) flight formation, (2) mission planning and control, and (3) sensor data interpretation, and it demonstrates a collaborative microdrone system for first response operations.

This project is joint work with three research groups at Klagenfurt University and the University of Central Florida. It is supported by Lakeside Labs GmbH and funded by the European Regional Development Fund and the Carinthian Economic Promotion Fund (grant 20214/17095/24772).

SRSnet *Lakeside Labs & EC Interreg 4; co-PI; 9/2009 - 8/2012; overall budget: k€ 850; funding KLU: k€ 387*

The SRSnet project focuses on the design of a smart resource-aware multi-sensor network capable of autonomously detecting and localizing various events such as screams, animal noise, tracks of persons and more complex human behaviors. The project's research areas include (i) collaborative audio and video analysis, (ii) complex event detection and (iii) network reconfiguration. The SRSnet will be demonstrated in an environmental case study at the Hohe Tauern National Park.

This project is joint work with the Institute of Smart Systems Technologies at Klagenfurt University, the University of Udine and Lakeside Labs. It is funded by the European Interreg 4 Fund and the Carinthian Economic Promotion Fund.

SOMA *Lakeside Labs; co-PI; 1/2009 - 12/2011; overall budget: M€ 1.02; funding KLU: k€ 779*

The project "Self-organizing Multimedia Architecture (SOMA)" aims to capture the whole life-cycle of multimedia content in a single architecture for large distributed multimedia information systems. A network of smart sensors reports events to a distribution network captured in multimedia data units. In the distribution network events are analyzed, processed, stored, and prepared for delivery. Events and related continuous data are either pushed to users on a subscription basis or consumed by users based on pull mechanisms.

This project is joint work with the Institute of Information Technology at Klagenfurt University and ASFiNAG Mautservice, Austria. It is supported by Lakeside Labs GmbH and funded by the European Regional Development Fund and the Carinthian Economic Promotion Fund (grant 20214/17095/24774).

CLIC *FFG (no. 819482); co-PI; 1/2009 - 12/2010; overall budget: k€ 720; funding KLU: k€ 120*

The objective of the CLIC (Closed-Loop Integration of Cognition, Communication and Control) project is to integrate real-time image analysis, adaptive motion control, and synchronous communication between the imaging and control subsystems. This integration is demonstrated on optimizing the trajectory control of a crane additionally equipped with distributed smart cameras observing the crane's environment.

This project is joint work with Vienna University of Technology and TTTech AG Vienna and is supported by Austrian Research Promotion Agency (FFG) via the FIT-IT [embedded system] program. The CLIC project has been awarded as the **best research proposal in the FIT-IT [embedded system] program line** and received the award from the federal minister of transportation, innovation and technology Mrs. Doris Bures.

EVis *FFG (no. 813399); consortium speaker; 4/2007 - 6/2010; overall budget: k€ 508; funding KLU: k€ 220*

This project deals with the evaluation and prototype development of a distributed embedded platform for online data fusion. This multi-sensor fusion architecture is targeted at various applications such as smart embedded systems, remote sensing, pervasive computing and monitoring.

This project is joint work with Graz University of Technology and EFKON AG Graz and is supported by Austrian Research Promotion Agency (FFG) via the FIT-IT [visual computing] program.

McDAV (principle investigator; 2008 - 2009): Smart cameras perform image analysis onboard and deliver the abstracted data. By combining data delivered from multiple cameras observing the same scene we can further increase the usefulness of smart camera networks. An important goal for such multi-camera systems is to resolve object occlusions by aggregating views from different angles. The aim of this research is to develop a data aggregation and visualization system which is able to combine the high-level output of smart cameras to form a three-dimensional model of a scene.

This research is conducted in cooperation with the Austrian Institute of Technology, Vienna.

I-SENSE (project leader; 2006 - 2008): This project deals with the evaluation and prototype development of a distributed embedded platform for online data fusion. This multi-sensor fusion architecture is targeted at various applications such as smart embedded systems, remote sensing, pervasive computing and monitoring.

This project is joint work with EVK Graz and is supported by Austrian Research Promotion Agency (grant no. 812204).

SmartSURV (project leader; 2005 - 2007): This project deals with the evaluation and development of middleware-services for distributed embedded systems. These services focus on dynamic reconfiguration which enables a modification of tasks during operation and a migration of tasks onto different embedded computing nodes. The dynamic reconfiguration methods are demonstrated in a novel traffic surveillance system.

This project is joint work with the Austrian Research Centers Seibersdorf (ARCS) and is supported by Austrian Research Promotion Agency (grant no. 81072).

SmartCam (project leader; 2002 - 2007): The goal of this project is to evaluate and develop an embedded smart camera targeted for various surveillance applications such as traffic control. This camera is realized as an embedded system with tight power restrictions and combines video sensing, video processing and communication within a single device. It captures a video stream, computes high-level traffic information such as stationary vehicle detection and motion analysis, and transfers the compressed video stream and traffic information to a network node. The smart camera is realized using a CMOS sensor, high-performance signal processors and dedicated hardware.

This project is joint work with the Austrian Research Centers Seibersdorf (ARCS) and the Institute for Computer Graphics and Vision at TU Graz. This project is supported by Texas Instruments.

Intelligent Multi-Sensor System (project leader; 2003 - 2007): This project deals with the design, evaluation and development of an infrastructure for combining/connecting various intelligent (video) sensors. This infrastructure provides mechanisms for transferring multimedia data from the sensors as well as for configuring/migrating computational and communication tasks depending on the context of the sensors. The intelligent sensors are based on SmartCams; the infrastructure is deployed in traffic surveillance applications.

Performance Modeling and Prediction in Automation Systems (project leader; 2001 - 2004): This project deals with modeling and predicting the performance of the PUMA Open automation system. This complex automation system is targeted for the design and test of engines, transmissions and power trains and exhibits real-time and non real-time processing at the same platform. An important goal of this project is to introduce performance modeling into the design process in order to reduce the development time of new configurations of the automation system.

This project is joint work with AVL Graz GmbH.

Monitoring and Diagnosis of Technical Systems (principle investigator; 2000 - 2005): The goal of this project is to investigate and develop a model-based monitoring and diagnosis system (MDS) for online operation. The MDS has been implemented using process control computers and PCs and has been demonstrated on monitoring and diagnosing a complex heating system.

This project is supported by the Austrian Science Fund under grant number P14233-INF.

PEPSY - Prototyping Environment for multi-DSP Systems (project leader with Martin Schmid; 1999 - 2003): This project aims at automating the design and implementation of multi-processor applications subject to various design constraints. The prototyping tool PEPSY maps a dataflow-oriented application onto a multi-processor system, generates a static schedule for all processor and synthesizes the complete source code. PEPSY has been completely implemented and tested on various applications in the area of signal processing and power-aware computing.

Self-calibrating Monitoring (principal investigator; 1998 - 1999): The goal of this project was to develop a model-based monitoring system that exploits the measurements from the supervised system in order to refine its initial system's model. This self-calibrating monitoring system has been implemented using qualitative reasoning techniques.

This project was performed at the Department of Computer Sciences at the University of Texas and was supported by the Austrian Science Fund under grant number J1429-MAT.

Best Signal Selection (project leader: 1997 - 1998): The goal of this project was to evaluate various techniques that determine the quality of different transmission channels. A prototype has been developed which online select the channel with the highest speech quality as output. The prototype has been implemented on a standard PC equipped with signal processor and audio boards.

This project was joint work with Frequentis Nachrichtentechnik GmbH Wien.

Distributed Computer Architecture for Qualitative Simulation (project member: 1994 - 1997): The goal of this project was to develop a specialized computer architecture for the AI-application "qualitative simulation". The performance of this application has been improved by two orders of magnitude by parallelization and software/hardware migration. The prototype architecture has been implemented using digital signal processors and FPGAs.

This project was supported by the Austrian Science Fund under grant number P10441-MAT.

Research projects at the master's level have been conducted in cooperation with the following partners:

- Austrian Research Centers Seibersdorf
- AVL List GmbH, Graz
- BearingPoint, Graz-Unterpemstätten (formerly "Infonova GmbH")
- Carinthian Tech Research, Villach
- c.c.com, Graz Grambach
- DaimlerChrysler AG, Graz
- Ebewe Pharma, Unterach
- EVK, Graz Raaba
- Frequentis GmbH, Wien
- Infineon Technologies Austria AG, Villach
- Infineon Technologies Microelectronic Design Centers Austria, Graz
- KAI – Kompetenzzentrum für Industrieelektronik, Villach
- MagnaSteyr Engineering, Graz
- Space Research Institute, Austrian Academy of Sciences, Graz
- Siemens Corporate Research, Princeton, USA
- Texas Instruments, Freising, Germany

5 Publications

5.1 Journal Papers

- [47] Evsen Yanmaz, Saeed Yahyanejad, Bernhard Rinner, Hermann Hellwagner and Christian Bettstetter. Drone Networks: Communications, Coordination, and Sensing. *Ad Hoc Networks*, Elsevier, 68:1-15, 2018
- [46] Adam Erdelyi, Thomas Winkler and Bernhard Rinner. Privacy Protection vs. Utility in Visual Data: An Objective Evaluation Framework. *Multimedia Tools and Applications*, Springer 7(2):2285-2312, 2018.

- [45] Asif Khan, Bernhard Rinner and Andrea Cavallaro. Cooperative Robots to Observe Moving Targets: A Review. *IEEE Transactions on Cybernetics*, 48(1):187-198, 2018.
- [44] Venkata Pathuri Bhuvana, Melanie Schranz, Carlo S. Regazzoni, Bernhard Rinner, Andrea M. Tonello and Mario Huemer. Multi-Camera Object Tracking using Surprisal Observations in Visual Sensor Networks. *EURASIP Journal on Advances in Signal Processing*, 2016:50 2016.
- [43] Muhammad Imran, Bernhard Rinner, Sajjad Zandi Zand and Mattias O’Nils. Exploration of Pre-Processing Architectures for FPGA Based Thermal-Visual Smart Camera. *Journal of Electronic Imaging*, 25(4), 041006, 2016.
- [42] Claudio Piciarelli, Lukas Esterle, Asif Khan, Bernhard Rinner, Gian Luca Foresti. Dynamic Reconfiguration in Camera Networks: a short Survey. *IEEE Transactions on Circuits and Systems for Video Technology*, 26(5):965-977, May 2016.
- [41] Melanie Schranz and Bernhard Rinner. Resource-Aware Dynamic Clustering Utilizing State Estimation in Visual Sensor Networks. *Sensors & Transducers*, 129(8):28-39, August 2015.
- [40] Michael Hofbauer, Andreas Müller, Justus Piater, Bernhard Rinner, Gerald Steinbauer, Markus Vincze, Christian Wögerer. Making Better Robots – Beiträge Österreichs zur Europäischen Robotics Research Roadmap. *e&i Elektrotechnik und Informationstechnik*, 132(4):237-248, August 2015.
- [39] Daniel Wischounig-Strucl, Bernhard Rinner. Resource Aware and Incremental Mosaics of Wide Areas from Small-Scale UAVs. *Machine Vision and Applications*, 26(7):885-904, 2015.
- [38] Bernhard Rinner, Lukas Esterle, Jennifer Simonjan, Georg Nebehay, Roman Pflugfelder, Peter R. Lewis, Gustavo Fernandez Dominguez. Self-aware and Self-expressive Camera Networks. *IEEE Computer*, 48(7):21-28, July 2015.
- [37] Peter R. Lewis, Lukas Esterle, Arjun Chandra, Bernhard Rinner, Jim Torresen, Xin Yao. Static, Dynamic and Adaptive Heterogeneity in Distributed Smart Camera Networks. *ACM Transactions on Autonomous and Adaptive Systems*, 10(2) pages 30, 2015.
- [36] Asif Khan, Evsen Yanmaz and Bernhard Rinner. Information Exchange and Decision Making in Micro Aerial Vehicle Networks for Cooperative Search. *IEEE Transactions on Control of Networked Systems*, 2(4):335-347, 2015.
- [35] Muhidul Khan and Bernhard Rinner. Performance Analysis of Resource-Aware Task Scheduling Methods in Wireless Sensor Networks. *International Journal of Distributed Sensor Networks*, pages 11, 2014.
- [34] Saeed Yahyanejad and Bernhard Rinner. A fast and mobile system for registration of low-altitude visual and thermal aerial images using multiple small-scale UAVs. *ISPRS Journal of Photogrammetry and Remote Sensing*, 104:189-202, June 2015.
- [33] Thomas Winkler and Bernhard Rinner. Security and Privacy Protection in Visual Sensor Networks: A Survey. *ACM Computing Surveys*, 47(1):pages 38, May 2014.
- [32] Martin Reisslein, Bernhard Rinner, Amit Roy-Chowdhury. Smart Camera Networks (Guest Editors’ Introduction). *Computer*, 47(5):26-28, May 2014.
- [31] Umair Ali Khan and Bernhard Rinner. Online Learning of Timeout Policies for Dynamic Power Management. *ACM Transactions on Embedded Computing Systems*, 13(4), pages 25, 2014.
- [30] Lukas Esterle, Peter R. Lewis, Xin Yao and Bernhard Rinner. Socio-Economic Vision Graph Generation and Handover in Distributed Smart Camera Networks. *ACM Transactions on Sensor Networks*, ACM, 10(2), pages 24, 2014.
- [29] Fatih Porikli, Francois Bremond, Shiloh L. Dockstader, James Ferryman, Anthony Hoogs, Brian C. Lovell, Sharath Pankanti, Bernhard Rinner, Peter Tu, and Peter L. Venetianer. Video Surveillance: Past, Present, and Now the Future. *IEEE Signal Processing Magazine*, 30(3):190-198, May 2013.
- [28] Thomas Winkler and Bernhard Rinner. User Centric Privacy Awareness in Video Surveillance. *Springer Multimedia Systems Journal*, 18(2), pages 99-121, 2012.

- [27] Bernhard Dieber, Christian Micheloni and Bernhard Rinner. Resource-Aware Coverage and Task Assignment in Visual Sensor Networks. *IEEE Transactions on Circuits and Systems for Video Technology*, 21(10), pages 1424-1437, October 2011.
- [26] Thomas Winkler and Bernhard Rinner. Securing Embedded Smart Cameras with Trusted Computing. *EURASIP Journal on Wireless Communications and Networking*, Article ID 530354, 20 pages, 2011.
- [25] Christian Micheloni, Bernhard Rinner and Gian Luca Foresti. Video Analysis in PTZ Camera Networks - From master-slave to cooperative smart cameras. *IEEE Signal Processing Magazine*, 27(5), pages 78-90, 2010.
- [24] Horst Bischof, Martin Godec, Christian Leistner, Andreas Starzacher and Bernhard Rinner. Autonomous Audio-Supported Learning of Visual Classifiers for Traffic Monitoring. *IEEE Intelligent Systems*, 25(3) pages 15-23, May/June 2010.
- [23] Markus Quaritsch, Karin Kruggl, Daniel Wischounig-Strucl, Subhabrata Bhattacharya, Mubarak Shah and Bernhard Rinner. Networked UAVs as Aerial Sensor Network for Disaster Management Applications. *e&i Elektrotechnik und Informationstechnik*, 127(3) pages 56-63, 2010 Springer.
- [22] Andreas Doblender, Andreas Zoufal and Bernhard Rinner. A Novel Software Framework for Embedded Multiprocessor Smart Cameras. *ACM Transactions on Embedded Computing Systems*, 8(3) article 24, 30 pages, April 2009.
- [21] Bernhard Rinner and Wayne Wolf. A Bright Future for Distributed Smart Cameras - scanning the issue. *Proceedings of the IEEE*, 96(10) pages 1562-1564, October 2008.
- [20] Bernhard Rinner and Wayne Wolf. Introduction to Distributed Smart Cameras. *Proceedings of the IEEE*. 96(10) pages 1565-1575, October 2008.
- [19] Andreas Klausner, Allan Tengg and Bernhard Rinner. Distributed multi-level Data Fusion for Networked Embedded Systems. *IEEE Journal on Selected Topics in Signal Processing*. 2(3) pages 538-555, August 2008.
- [18] Markus Quaritsch, Markus Kreuzthaler, Bernhard Rinner, Horst Bischof and Bernhard Strobl. Autonomous Multi-Camera Tracking on Embedded Smart Cameras. *EURASIP Journal on Embedded Systems*. 10 pages, Jan. 2007.
- [17] Milan Jovanovic, Andreas Klausner, Markus Quaritsch, Bernhard Rinner, and Allan Tengg. Smart Cameras for Embedded Vision. *Telematik*. 12(3) pages 14-19, 12(3), December 2006.
- [16] Andreas Doblender, Bernhard Rinner, Norbert Trenkwalder and Andreas Zoufal. A Middleware Framework for Dynamic Reconfiguration and Component Composition in Embedded Smart Cameras. *WSEAS Transaction on Computers*. 5(3) pages 574-581, WSEAS Press, March 2006.
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5.4 Patents

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5.5 Technical Reports

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5.6 Other Publications

- [12] Bernhard Rinner (editor). *Embedded Vision*. Telematik 12(3), Dec 2006. ISSN 1028-5068.
- [11] Bernhard Rinner (editor). *20 Jahre Telematik*. Telematik 11(2), Dec 2005. ISSN 1028-5068.
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6 Presentations

6.1 Invited Talks

- [39] *Privacy Protection in Visual Data*. Keynote talk at 10th International Symposium on Image and Signal Processing and Analysis, Ljubljana, Slovenia. September 20, 2017.
- [38] *Toward the Future of IoT with Drones*. Panel talk at IEEE Conference on Standards for Communications & Networking, Helsinki, Finland. September 19, 2017.
- [37] *Privacy in Visual Data*. Colloquium talk at University of Ontario Institute of Technology, Toronto, Canada. August 10, 2017.
- [36] *Privacy in Visual Data*. Colloquium talk at Boston University, MA, USA. August 3, 2017.
- [35] *Multi-Drone Systems*. Colloquium talk at Korea University, Seoul, Korea. April 19, 2017.
- [35] *Smart Camera Systems*. Overview talk at ACM Multimedia Systems Conference, Klagenfurt, Austria. May 10, 2016.
- [34] *Privacy-Protecting and Self-Aware Smart Cameras*. JKU Linz, Austria. January 18, 2016.
- [33] *Autonomous Networked Aerial Robot Systems*. Bundesministerium für Wissenschaft, Forschung und Wirtschaft, Vienna, Austria, October 15, 2015.
- [32] *On Privacy-Protecting and Self-Organizing Cameras*. CITIUS, University of Santiago, Spain. April 21, 2015.
- [31] *On Privacy-Protecting and Self-Organizing Cameras*. Austrian Computer Science Day, Graz, Austria. June 6, 2014.
- [30] *Security and Privacy Protection in Smart Camera Networks*. Colloquium. EPFL Multimedia Signalprocessing group, Lausanne, Switzerland. March 4, 2014.
- [29] *Security and Privacy Protection in Smart Camera Networks*. Invited talk. Fraunhofer Institut für Optronik, Systemtechnik und Bildauswertung, Karlsruhe Germany. March 3, 2014.
- [28] *Can Smart Cameras protect our Privacy?* Computer Science Colloquium. University of Birmingham, UK. September 26, 2013.
- [27] *Smart and Aerial Camera Networks*. Keynote lecture. IEEE Workshop on Camera Networks and Wide Area Scene Analysis. Portland, USA. June 28, 2013.
- [26] *Visuelle Sensornetze*. Colloquium. Universität Tübingen, Germany. May 27, 2011.
- [25] *Visuelle Sensornetze: Chancen und Herausforderungen*. Colloquium. HU Berlin, Germany. April 18, 2011.
- [24] *Pervasive Smart Cameras*. Keynote lecture. International Conference on Pervasive and Embedded Computing and Communications Systems (PECCS), Algarve, Portugal. March 6, 2011.
- [23] *Visuelle Sensornetze: Chancen und Herausforderungen*. Colloquium. TU Kaiserslautern, Germany. January 22, 2011.
- [22] *Distributed Smart Cameras: Past - Present - Future*. Keynote lecture. ACM/IEEE International Conference on Distributed Smart Cameras (ICDSC), Atlanta, USA. September 2, 2010.
- [21] *Challenges and Opportunities of Distributed Smart Cameras*. University of Central Florida, Orlando, USA May 20, 2009.
- [20] *From Smart Cameras to Visual Sensor Networks*. Georgia Institute of Technology, Atlanta, USA March 6, 2009.
- [19] *Distributed Smart Cameras*. Colloquium. Tübingen University, Germany May 6, 2008.
- [18] *Was macht Kameras intelligent ?* Tag der Forschung. Klagenfurt University, November, 2007.

- [17] *Intelligente Kameras*. Informatics Keynote. Austrian Computer Society, Vienna, September 19, 2007.
- [16] *Pervasive Computing – wie Computer unser Alltagsleben durchdringen*. Inaugural Lecture. Klagenfurt University, May 4, 2007.
- [15] *Embedded Middleware on Distributed Smart Cameras*. IEEE Conference on Acoustics, Speech, and Signal Processing (ICASSP 2007), April 2007, special session on Distributed Processing in Image Sensor Networks.
- [14] *Distributed Smart Cameras*. Princeton University, Department of Electrical Engineering, July 2006.
- [13] *Architekturen verteilter eingebetteter Systeme*. Universität Innsbruck, January 2006.
- [12] *Architekturen verteilter eingebetteter Systeme*. Universität Frankfurt, Fakultät für Informatik, January 2006.
- [11] *Intelligente Kameras zur Verkehrsüberwachung*. 20. Österreichische Automatisierungstag, Graz October 2005.
- [10] *Intelligente Kameras in “Smart Environments”*. Alpen-Adria Universität Klagenfurt, September 2005.
- [9] *Architectures of Smart Embedded Systems*. Berlin University of Technology, Department of Electrical Engineering and Computer Science, December 2004.
- [8] *Rapid Prototyping of Multi-DSP Systems*. University of the Federal Armed Forces Munich, Department of Computer Science, June 2002.
- [7] *Monitoring and Diagnosis of Technical Systems*. (Habilitation lecture) Graz University of Technology, January 2002.
- [6] *Refining Semi-Quantitative Models*. Workshop on Differential Inclusions and Qualitative Reasoning in Global Change: Theory and Practice, Potsdam Institute for Climate Impact Research, Germany, May 1999.
- [5] *Monitoring Piecewise Continuous Behaviors by Trackers and their Models*. NASA Ames, Moffett Field, CA, USA, March 1999.
- [4] *Monitoring with Trackers Based On Semi-Quantitative Models*. (joint talk with Ben Kuipers), Corporate Engineering, Phillips Petroleum Company, OK, USA, October 1998.
- [3] *Towards Embedded Qualitative Simulation*. Department of Computer Sciences, University of Texas at Austin, USA, June 1998.
- [2] *Performance Improvements of AI Techniques by Specialized Computer Architectures*. Department of Mathematics and Computer Science, University of Udine, Italy, September 1996.
- [1] *Distributed Computer Architecture for Qualitative Simulation*. Department of Computer Sciences, University of Texas at Austin, USA, July 1995.

6.2 Tutorials

- [8] Tutorial on *Privacy-Protecting and Self-Aware Smart Cameras*. VISMAL Summer School, Pordenone, Italy. June 2016.
- [7] Tutorial on *Visual Sensor Networks*. University of Udine, Italy. December 2014.
- [6] Tutorial on *Visual Sensor Networks*. Summer School on Design for Interactive and Cognitive Environments (DICE). Baarlo, Netherlands, July 2013.
- [5] Tutorial on *Smart Cameras and Visual Sensor Networks*. Second Smart Surveillance Spring School (S5), Modena, Italy, May 2013.
- [4] Half-day tutorial on *Smart Cameras and Visual Sensor Networks*. SPIE Electronic Imaging, San Francisco, USA, January 2011.
- [3] Half-day tutorial on *Smart Cameras and Visual Sensor Networks*. Embedded Systems Week, Grenoble, France, October 2009. (joint tutorial with F. Berry, D. Ginhac and J. Falcou)

- [2] Tutorial on *Smart Cameras and Visual Sensor Networks*. International CONET Summer School "SENIOT: From Sensor Networks to Networked Intelligent Objects", Bertinoro, Italy, July 2009.
- [1] Half-day tutorial on *Distributed Vision Processing in Smart Camera Networks*. IEEE Conference on Computer Vision and Pattern Recognition (CVPR 2007), Minneapolis, USA, June 2007. (joint tutorial with H. Aghajan, F. Berry, H. Bischof, R. Kleihorst and W. Wolf)

6.3 Conference Presentations

- [14] *The Evolution from Single to Pervasive Smart Cameras*. ACM/IEEE International Conference on Distributed Smart Cameras (ICDSC-08). Stanford, USA. September 2008.
- [13] *Autonomous Multi-Camera Tracking using Embedded Smart Cameras*. Workshop on Distributed Smart Cameras (DSC-06), Boulder CO. USA, October 2006.
- [12] *Online Multi-Criterion Optimization for Dynamic Power-Aware Configuration Management in Distributed Embedded Surveillance Clusters*. IEEE 20th International Conference on Advanced Information Networking and Applications (AINA 2006). Vienna, Austria, April 2006.
- [11] *Innovative Video Applications on High-Performance DSPs*. Texas Instruments Developer Conference. Houston, TX, USA, February 2004.
- [10] *Rapid Prototyping of flexible Embedded Systems multi-DSP Architectures*. Design, Automation & Test in Europe (DATE 2003). Munich, Germany, March 2003.
- [9] *From Tracking Continuous Mode Hypotheses to Diagnosing Technical Systems*. Twelfth International Workshop on Principles of Diagnosis. Via Lattea, Italy, March 2001.
- [8] *Lessons Learned from Prototyping Parallel Computer Architectures for AI Algorithms*. AAI Workshop on Parallel and Distributed Search for Reasoning. Austin, TX, August 2000.
- [7] *Monitoring Piecewise Continuous Behaviors by Semi-Quantitative Trackers*. 16th International Joint Conference on Artificial Intelligence (IJCAI-99), Stockholm, Sweden, August 1999.
- [6] *Monitoring Piecewise Continuous Behaviors by Trackers and their Models*. AAI Spring Symposium Series: Hybrid Systems and AI, Stanford, CA, March 1999.
- [5] *On-line Scheduling of Tasks in Multi-DSP Systems*. 8th International Conference on Signal Processing Applications & Technology, San Diego, USA, September 1997.
- [4] *A Multi-DSP System with Dynamically Reconfigurable Coprocessors*. 7th International Conference on Signal Processing Applications & Technology, Boston, USA, October 1996.
- [3] *Improving Performance of the Qualitative Simulator QSIM*. ISCA International Conference on Parallel and Distributed Computing Systems, Orlando, FL, September 1995.
- [2] *Parallel Qualitative Simulation*. 1995 EUROSIM Congress, Vienna, Austria, September 1995.
- [1] *High-Performance Simulators Based on Multi-TMS320C40*. Fifth Annual Texas Instruments Educators Conference, Houston, TX, August 1995.

7 Teaching

7.1 Lectures

- *Research Seminar in Pervasive Computing* (in English) 700.490, Klagenfurt University, SS 2008, SS 2009, SS 2010, SS 2011, SS 2013, SS 2014, SS 2015, SS 2016, SS 2018.
- *Advanced Topics in Pervasive Computing, VK* (in English) 700.410, Klagenfurt University, SS 2008, SS 2009, SS 2010.

- *Sensor Networks, VK* (in English) 700.410, Klagenfurt University, SS 2011, SS 2013, SS 2014, SS 2015, SS 2016, SS 2018.
- *Entwurf digitaler Schaltungen, VO* (Design of Digital Circuits, lecture) 700.410, Klagenfurt University, WS 2007/2008, WS 2008/2009, SS 2010, SS 2011, SS 2012, SS 2013, SS 2014, SS 2015, SS 2016, WS 2017/2018, SS 2018.
- *Digital Signal Processors, lecture* (in English) 700.410, Klagenfurt University, WS 2007/2008, SS 2009, WS 2009/2010, WS 2010/2011, WS 2011/2012, WS 2012/2013, WS 2013/2014, WS 2014/2015, WS 2015/2016, WS 2016/2017.
- *Pervasive Computing, VK* (in English) 623.417, Klagenfurt University, SS 2007, SS2008, WS 2008/2009, WS 2009/2010, WS 2010/2011, WS 2011/2012, WS 2012/2013, WS 2013/2014, WS 2014/2015, WS 2015/2016, WS 2016/2017, WS 2017/2018.
- *Seminar in Pervasive Computing* (in English) 700.491, Klagenfurt University, SS 2007, WS 2007/2008, WS 2008/2009, WS 2009/2010, WS 2010/2011, WS 2011/2012, WS 2012/2013, WS 2013/2014, WS 2014/2015, WS 2015/2016.
- *Context-Aware Computing, VO* (lecture), 448.056, Graz University of Technology, SS 2006, WS 2006/2007, WS 2007/2008.
- *Context-Aware Computing, RU* (tutorial), 448.057, Graz University of Technology, SS 2006, WS 2006/2007, WS 2007/2008.
- *Einführung in die Informatik, VL* (Introduction to Computer Science, lecture) 448.016, Graz University of Technology, SS 2000, SS 2001.
- *Einführung in die Informatik, RU* (Introduction to Computer Science, tutorial) 448.014, Graz University of Technology, WS 1997/1998.
- *Einführung in die Informatik, LU* (Introduction to Computer Science, lab) 448.018, Graz University of Technology, WS 1997/1998, SS 1998, SS 2000, SS 2001.
- *Technische Informatik 1, VO* (Computer Organization 1, lecture) 448.003, Graz University of Technology, WS 2005/2006.
- *Technische Informatik 1, RU* (Computer Organization 1, tutorial) 448.004, Graz University of Technology, WS 1999/2000, WS 2000/2001, WS 2001/2002, WS 2002/2003, WS 2003/2004, WS 2004/2005, WS 2005/2006.
- *Technische Informatik, LU* (Computer Organization, lab) 448.010, Graz University of Technology, WS 1997/1998, WS 1999/2000, WS 2000/2001.
- *VLSI Prozessoren, RU* (VLSI Processors, lab) 448.026, Graz University of Technology, WS 1997/1998, WS 1999/2000, WS 2000/2001.
- *Signalprozessoren, VO* (Signal Processors, lecture) 448.034, Graz University of Technology, WS 2002/2003, SS 2003, WS 2003/2004, SS 2004, WS 2004/2005, SS 2005, WS 2005/2006, SS 2006, WS 2006/2007, SS 2007.
- *Signalprozessoren, RU* (Signal Processors, lab) 448.035, Graz University of Technology, WS 2001/2002, WS 2002/2003, SS 2003, SS 2004, SS 2005, SS 2006, WS 2006/2007.
- *Fehlertolerante Rechnersysteme, RU* (Fault-Tolerant Computing Systems, tutorial) 448.031, Graz University of Technology, SS 2003, SS 2004, SS 2005, SS 2006.
- *Architektur verteilter Systeme, VO* (Architecture of Distributed Systems, lecture), 448.020, Graz University of Technology, SS 2001, SS 2002.
- *Architektur verteilter Systeme, RU* (Architecture of Distributed Systems, tutorial), 448.021, Graz University of Technology, SS 2001, SS 2002.
- *Echtzeit-KI-Systeme, VO* (Real-Time Artificial Intelligence, lecture), 448.054, Graz University of Technology, SS 2002, SS 2003, SS 2004, SS 2005, SS 2006, WS 2006/2007.

- *Echtzeit-KI-Systeme, RU* (Real-Time Artificial Intelligence, tutorial), 448.055, Graz University of Technology, SS 2002, SS 2003, SS 2004, SS 2005, SS 2006, WS 2006/2007.
- *Seminar/Projekt Technische Informatik* (seminar/project Computer Engineering), 448.021, Graz University of Technology, WS 1997/1998, WS 1999/2000, WS 2000/2001, WS 2002/2003, SS 2003, WS 2003/2004, SS 2004, WS 2004/2005, SS 2005, WS 2005/2006, SS 2006, WS 2006/2007.

7.2 Guest Lectures

- *Advanced Topics in Pervasive Computing* (in English) University of Udine, Italy, WS 2014/2015.
- *Pervasive Computing in Multimedia Systems, VK* (in English) University of Udine, Italy, SS2008.
- *Context-Aware Computing, VO* (lecture), 448.056, Graz University of Technology, WS 2007/2008, WS 2009/2010, WS 2010/2011, WS 2011/2012, WS 2012/2013.

7.3 Supervision of Master's Theses

- Johannes Riedl. *Parallele Algorithmen und Laufzeitmessungen für Constraint Satisfaction im qualitativen Simulator QSIM*. 1995.
- Diethard Kaufmann. *Parallele Implementierung des qualitativen Simulators QSIM auf einer Multi-DSP Architektur*. 1996.
- Alexander Haymaier. *Analyse und experimentelle Bewertung von Algorithmen zur Best Signal Selection*. 1998.
- Franz Silli. *Entwurf und Implementierung eines konfigurierbaren Trainingssystems zur Verbesserung kognitiver Fähigkeiten*. 1998.
- Bernhard Obermaier. *Entwurf und Implementierung eines Spracherkennungssystems auf einem TMS320C40 Signalprozessor*. 1998.
- Bernd Rupprechter. *Rapid Prototyping von Multi-DSP Systemen anhand einer audiotecnischen Anwendung*. 2001.
- Siegbert Waldner. *An Implementation of an on-line model-based Monitoring System*. 2001.
- Rene Widowitz. *Fraud Analysis, Detection, Prevention in Voice over IP Networks*. 2002.
- Arnold Maier. *Evaluation of Dynamic Voltage Scaling on the CARMEL Signal Processor*. 2002.
- Edin Arnautovic. *Integration of Session Initiation Protocol (SIP) Functionality into an IP Telephony System*. 2002.
- Suad Kajtazovic. *Scheduling in Multiprocessor Systemen mittels Constraint Satisfaction*. 2002
- Martin Schittegg. *Entwicklung einer Testumgebung für ein Voice over IP Telefonie System*. 2002.
- Heinz Töffler. *Data Preselection using a Lookup Table for the Space Telescope COROT*. 2002.
- Andreas Doblender. *Refinement of Uncertain Models by Parameter Models and Subspace Refutation*. 2003.
- Christian Steindl. *Analyse und Bewertung von Datenbankzugriffsmechanismen und Ableitung eines Realisierungskonzepts*. 2003.
- Ozren Milosavljevic. *Leistungsbewertung von Client/Server-Applikationen in komplexen, heterogenen Rechnernetzwerken*. 2003.
- Peter Ranegger. *Evaluierung von Java-Frameworks für die Evaluierung von Web-Applikationen*. 2003.
- Frank Strieder. *Entwicklung eines Frequenzumrichters auf einem digitalen Signalprozessor*. 2004.
- Franz Hackl. *Überwachung hybrider Systeme mit Intervallmodellen*. 2004.
- Josef Brunner. *Software Optimization Techniques for DSP-based Embedded Systems*. 2004.

- Thomas Trathnigg. *Combined Management of Power and Quality of Service in Video Surveillance Systems*. 2004.
- Klaus Matuschek. *Steigerung der Verfügbarkeit eines heterogenen Voice-over-IP Systems im Zuge einer Session-Initiation-Protocol-Integration*. 2005.
- Markus Quaritsch. *An Agent-based Framework for Object Tracking among multiple Smart Cameras*. 2005.
- Thomas Winkler. *Load Distribution for Embedded Smart Cameras based on Mobile Agents*. 2005.
- Dietmar Gösseringer. *Evaluation of a Model-Based Design Approach for Embedded Image Processing Algorithms*. 2005.
- Van Tin Lai. *Evaluierung einer Agentenplattform für den Einsatz in einem verteilten eingebetteten System*. 2005.
- Matthias Pfragner. *Performance Evaluation of Complex Automation Systems*. 2005.
- Vedran Bauer. *Schnelle Bildverarbeitungs-Algorithmen zur Objektklassifizierung auf digitalen Signalprozessoren*. 2006.
- Wolfgang Schriebl. *Implementation and Evaluation of Online Multi-Criterion Optimization for Dynamic Power-Aware Smart Camera Reconfiguration*. 2006.
- Michael Faschinger. *Design and Implementation of mobile and locatable RFID Readers*. 2006.
- Martin Mangard. *Motion Detection on Embedded Smart Cameras*. 2006.
- Markus Kreuzthaler. *Multi-Camera Tracking on Distributed Smart Cameras*. 2006.
- Norbert Trenkwalder. *Ein Publisher/Subscriber System für eingebettete Smart Cameras*. 2007.
- Karima Klamlinger. *Design and Implementation of a Fault Tolerance Concept in a Network of Smart Cameras*. 2007.
- Martin Dientl. *Implementierung eines akustischen Echokompensationssystems auf dem digitalen Signalprozessor TMS320DM642*. 2007.
- Stefan Erb. *Classification of Vehicles based on Acoustic Features*. 2007.
- Mario Wiesinger. *Ein Übertragungsschema für H.264 codierte Videodaten mittels Stream Control Transmission Protokoll (SCTP)*. 2007.
- Christian Galbavy. *Qualitätsverbesserung von Gepäcksortieranlagen durch Bilderkennung*. 2007.
- Bernhard Hohmann. *Multiuser Communication in Ad-hoc Networks*. 2007.
- Felix Pletzer. *Location Based Services for Wireless Sensor Networks*. 2008.
- Bernhard Dieber. *Localization with Active Long-Range RFID*. 2008.
- Andreas Fischer. *Fixed-point Implementierung von akustischen Feature-Extraktions Algorithmen*. 2008.
- Andreas Weiss. *Entwicklung einer eingebetteten Prototypenplattform zur Sensorfusion im Bereich der Verkehrsüberwachung*. 2008.
- Karl Flicker. *Analyse und Erweiterung der Hardwarebeschreibungssprache HDCaml*. 2008.
- Herwig Guggi. *Sensor Fusion für ein LED-basiertes multi-spektrales Aufnahmesystem*. 2009.
- Yuvarakesh Vadlamudi. *Face Detection using Smooth Edges and Color Segmentation Techniques*. 2009.
- Stefan Urabl. *Evaluation and Implementation of Localization Methods in Wireless Sensor Networks using the SunSPOT Platform*. 2009.
- Martin Kammerhofer. *Evaluation and Implementation of Time-Synchronization for Distributed Systems*. 2009.
- Lokesh Peddireddi. *Audio Feature Extraction for Traffic Monitoring on an Embedded Platform*. 2009.

- Mourya Chintalapati. *Evaluation of Virtualization Technologies for a Single-Core DSP Architecture*. 2010.
- Michal Filip Gurtowski. *Implementierung und Evaluierung eines Transport-Monitoring-Systems basierend auf Drahtlosen Sensornetzwerken*. 2010.
- Melanie Schranz. *Consensus in Smart Camera Networks*. 2011
- Misiorny Jakub Mikolaj. *Feature extraction and matching in multi-spectral images*. 2011
- Gumpena Neelima Towards. *Realization of Mining Clouds*. 2012
- Sharath Chandra Akkaladevi. *Distributed Object Tracking in Multi-Camera Networks*. 2012
- Udaya Lakshmi Cherukuri. *Video-based Pedestrian Detection using Optical Flow Information*. 2012
- Sandeep Katragadda. *Reliable and Robust Feature Point Detection for Stereoscopic Image Analysis*. 2012
- Gerald Stanje. *Communication and Energy Allocation Algorithms for Energy Harvesting Active Networked Tag*. 2012
- Roland Wasserer. *Visualisation of Mosaicked Aerial Image Data in Multi-UAV Applications*. 2012
- Udaya Lakshmi Cherukuri. *Video-based Pedestrian Detection using Optical Flow Information*. 2012
- Marko Keuschnig. *Entwicklung eines optischen Messgerätes zur Unterstützung von Roboterkalibrierungen*. 2013
- Vidya Sagar Kantamneni. *Development of Configurable Wave Filters for Automotive Sensors*. 2013
- Alankar Aryal Atreya. *Combining Multiple Tracking Approaches for Improving Performance*. 2013
- Jennifer Simonjan. *Development of a Smart Lighting Application: Exploring Self-Organization in the Internet of Things*. 2014
- Andrija Sucevic. *Extraction of biometrical features for identification of a 3D head model using Microsoft Kinect*. 2014
- Michael Höberl. *Securing Visual Sensor Nodes with Physically Unclonable Functions*. 2015
- Chiara Populin. *Evaluation of Privacy Protection in Aerial Videos*. 2016
- Jakob Schauer. *An Embedded Smart Camera based on a Low-power Microcontroller*. 2016
- Erica Perseghin. *Online Performance Monitoring of a Visual Sensor Node*. University of Udine, 2016
- Clio Bofelli. *A Benchmark for Embedded Smart Camera Platforms*. University of Udine, 2017
- Gavin Cetollo. *Distance Estimation Techniques for monocular Vision Systems*. University of Udine, 2017
- Francesco Manzato. *Tracking with on-board Sensors: Evaluation through KITTI and Motion Capture System*. University of Udine, 2017
- Maxim Alkhalou. *Anonymous Mutual Authentication Scheme for Internet-Integrated Sensing Devices*. 2017

7.4 Supervision of PhD Theses

- Ulrich Weiss. *Simulation with Imprecise Models for online Model-based Monitoring*. Graz University of Technology. 2003.
- Dietmar Prisching. *Performance Evaluation and Prediction in Complex Real-Time Automation Systems*. Graz University of Technology. 2003.
- Michael Bramberger. *Distributed Dynamic Task Allocation in Clusters of Embedded Smart Cameras*. Graz University of Technology. 2005.

- Arnold Maier. *Dynamic Power-Aware Camera Configuration in Distributed Embedded Surveillance Clusters*. Graz University of Technology. 2006.
- Andreas Doblender. *A Novel Software Framework for Multi-Processor Embedded Smart Cameras*. Graz University of Technology. 2006.
- Markus Quaritsch. *A Lightweight Agent-Oriented Middleware for Distributed Smart Cameras*. Graz University of Technology. 2008.
- Andreas Klausner. *Multi-Sensor Multi-Level Information Fusion on Embedded Systems*. Graz University of Technology. 2008.
- Allan Tengg. *A Generic, Dynamically Reconfigurable Data Fusion Architecture based on Distributed Embedded Systems*. Graz University of Technology. 2008.
- Andreas Starzacher. *Multi-Sensor Real-Time Data Fusion on Embedded Computing Platforms*. Klagenfurt University. 2010.
- Thomas Winkler. *Security and Privacy in Smart Camera Networks*. Klagenfurt University. 2011.
- Saeed Yahyanejad. *Orthorectified Mosaicking of Images from Small-scale Unmanned Aerial Vehicles*. Klagenfurt University. 2013.
- Umair Ali Khan. *Online Learning of Timeout Policies for Dynamic Power Management*. Klagenfurt University. 2013.
- Bernhard Dieber. *Resource-aware Reconfiguration of Visual Sensor Networks*. Klagenfurt University. 2013.
- Daniel Wischounig-Strucl. *Resource aware and incremental mosaics of wide areas from small-scale UAVs*. Klagenfurt University. 2013.
- Lukas Esterle. *Autonomous Distributed Tracking in Networks of Self-organised Smart Cameras*. Klagenfurt University. 2014.
- Muhidul Khan. *Resource-Aware Task Scheduling in Wireless Sensor Networks*. Klagenfurt University. 2014.
- Asif Khan. *Coordinated Unmanned Aerial Vehicles for Surveillance of Targets*. Klagenfurt University. 2015.
- Melanie Schranz. *Design Space Exploration for Coordination and Control Strategies in Visual Sensor Networks*. Klagenfurt University. 2016.

7.5 Co-supervision of PhD Theses

- Bernhard Peischl. *Automated Source-Level Debugging of Synthesizeable VHDL Designs*. Graz University of Technology. 2004. (co-advisor).
- Ulrich Muehlmann. *A High-speed CMOS Camera for Real-time Tracking Applications*. Graz University of Technology. 2008. (co-advisor).
- Clemens Arth. *Visual Surveillance on DSP-Based Embedded Platforms*. Graz University of Technology. 2008. (co-advisor).
- Sven Fleck. *Privacy Sensitive Surveillance*. University of Tübingen, Germany. 2008. (co-advisor).
- Yasir M. Mustafah. *Real-Time Face Detection on High Resolution Smart Camera System*. University of Queensland, Australia. 2011. (co-advisor).
- Rainer Matischek. *Real-Time Communication Protocols for Automotive Wireless Sensor Networks*. Vienna University of Technology. 2011. (co-advisor).
- Ali Akbar Zarezadeh. *Distributed Smart Cameras: Architecture and Communication Protocols*. Universität Potsdam, Germany. 2011. (co-advisor).

- Peter Holzer. *Multibody Structure and Motion from Structure and Motion in conjunction with Space Time Appearance Analysis*. Graz University of Technology. 2012. (co-advisor).
- Anilloy Frank. *A new Approach to the Identification of Variability in Model-based Embedded Software*. Graz University of Technology. 2012. (co-advisor).
- Leander Bernd Hörmann. *Hardware-Software Interactions in Energy Harvesting Wireless Sensor Networks*. Graz University of Technology. 2013. (co-advisor).
- Muhammad Imran. *Energy Efficient and Programmable Architecture for Wireless Vision Sensor Node*. Mid Sweden University. 2013. (opponent).
- Florian Seitner. *Virtual HW/SW Prototyping for Design and Runtime Prediction of Parallel Video Coding Systems*. Vienna University of Technology. 2013. (co-advisor).
- Niki Martinel. *A Distributed Video Surveillance System to Track Persons in Camera Networks*. University of Udine, Italy. 2014. (co-advisor).
- Karima Hein. *Assessing Event Detection Algorithms for Wireless Sensor Networks*. Graz University of Technology. 2014. (co-advisor).
- Tahir Nawaz. *Trajectory evaluation and analysis in videos*. Queen Mary University of London, UK. 2014. (co-advisor).
- Syed Fahad Tahir. *Person re-identification in camera networks*. Queen Mary University of London, UK. 2015. (co-advisor).
- Manuel Suarez Cambre. *Low power CMOS vision sensors for scale and rotation invariant feature detectors using CMOS heterogeneous smart pixel architectures*. Universidade de Santiago de Compostela, Spain. 2015. (co-advisor).
- Erik Ludwig Krempel. *Steigerung der Akzeptanz von intelligenter Videoüberwachung im öffentlichen Raum*. Karlsruhe Institut für Technologie, Germany. 2016. (co-advisor).
- ObaidUllah Khalid. *Performance evaluation for tracker-level fusion in video tracking*. Queen Mary University of London, UK. 2017. (co-advisor).

8 Research Grants and Awards

8.1 Received Research Grants

- Co-PI: *Karl Popper Kolleg*, Doctoral school funded by Alpen-Adria-Universität Klagenfurt; budget: k€ 520; October 2017 – September 2020
- PI: *ProSecCo*, "Brückenschlagproject" funded by Austrian Research Promotion Agency; budget: k€ 220; January 2014 – August 2017
- PI: *CROSMOS*, project funded by KWF/Lakeside Labs; budget: k€ 364; January 2013 – June 2015
- Co-PI: *ComVis*, project funded by BMWF/AIT; budget: M€ 2.1; January 2014 – December 2018
- PI: *SINUS*, project funded by KWF/Lakeside Labs; budget: k€ 880; January 2013 – June 2015
- PI: *TrustEYE*, project funded by KWF/Austrian Science Fund; budget: k€ 388; August 2012 – July 2015
- PI: *ICE Booster*, project funded by Lakeside Labs; budget: k€ 723; January 2011 – December 2014
- WP Leader: *EPiCS – Engineering Proprioception in Computing Systems*, FP7 Future Emerging Technologies (FET proactive) (grant no. 257906); budget: M€ 6.67; September 2010 – August 2014
- Co-PI: *MobiTrick – Mobile Traffic Checker*, "FIT-IT [visual computing]" research project funded by Österreichische Forschungsförderungsgesellschaft (FFG) (grant no. 819482); budget: k€ 656; July 2010 – June 2013

- Co-PI: *SRSnet – Smart Resource-Aware Multi-Sensor Network*, project funded by European Interreg 4 Fund and Carinthian Economic Promotion Fund; budget: k€ 850; September 2009 – August 2012
- Co-PI: *CLIC – Closed-Loop Integration of Cognition, Communication and Control*, “FIT-IT [embedded system]” research project funded by Österreichische Forschungsförderungsgesellschaft (FFG) (grant no. 819482); budget: k€ 720; January 2009 – December 2010
- Co-PI: *SOMA – Self-organizing Multimedia Architecture*, project funded by Lakeside Labs; budget: M€ 1.02; December 2008 – December 2011
- Consortium speaker: *cDrones – Collaborative Microdrones*, project funded by Lakeside Labs (grant 20214/17095/24772); budget: M€ 2.05; April 2008 – December 2011
- Consortium speaker: *EVis – Autonomous Traffic Monitoring by Embedded Vision*, “FIT-IT [visual computing]” project funded by Österreichische Forschungsförderungsgesellschaft (FFG) (grant no. 813399); May 2007 – April 2010
- Principle investigator: *I-SENSE – Embedded Multi Sensor Fusion Framework*, “FIT-IT [embedded system]” dissertation scholarship funded by Österreichische Forschungsförderungsgesellschaft (FFG) (grant no. 812204); June 2006 – May 2008
- Principle investigator: *Di-FUSE – A HW/SW Architecture for Embedded Distributed Data Fusion*, “FIT-IT [embedded system]” dissertation scholarship funded by Österreichische Forschungsförderungsgesellschaft (FFG) (grant no. 812033); June 2006 – May 2008
- Principle investigator: *Autonomous Reconfiguration in Distributed Smart Surveillance Systems*, “Bridge” research project funded by Österreichische Forschungsförderungsgesellschaft (FFG) (grant no. 810072); budget: k€ 150; September 2005 – August 2007
- Principle investigator: *Monitoring and Diagnosis of Hybrid Systems*, research project funded by the Austrian Science Fund (J14233-INF), ATS 2.034 Mio; April 2000 – May 2004
- Principle investigator: *Development of a Self-Calibrating Monitoring System*, post-doc scholarship funded by the Austrian Science Fund (J01429-MAT), US\$ 31 K; May 1998 - April 1999
- Co-investigator: *Distributed Computer Architecture for Qualitative Simulation*, research project funded by the Austrian Science Fund (P10441-MAT), ATS 560 K; April 1995 - March 1997

8.2 Research Awards

- Top 10% award at *IEEE International Conference on Image Processing (ICIP 2014)*, October 2014
- Best demo award at *IEEE International Conference on Multimedia and Expo (ICME 2012)*, July 2012
- Best student paper award at *IEEE International Symposium on Robotic and Sensors Environments (ROSE 2011)*, September 2011
- Best paper award (runner up) at *IEEE International Conference on Video and Signal-based Surveillance*, September 2010
- Best research proposal (3rd place) “FIT-IT [visual computing]” *MobiTrick – Mobile Traffic Checker*, Federal Ministry for Transport, Innovation and Technology; May 2010
- Best research proposal (1st place) “FIT-IT [embedded system]” *CLIC – Closed-Loop Integration of Cognition, Communication and Control*, Federal Ministry for Transport, Innovation and Technology; March 2009
- Award for Science Communication (2nd place): “How to fly Microdrones?”; Austrian Science Event “Lange Nacht der Forschung”; November 2008
- ACM Service Award, October 2007
- Laureate: *Best Telematik Dissertation*, Telematik Ingenieurverband (TIV), October 1997

9 Professional Activities and Serving

9.1 Professional Organizations

- Executive member of Telematik-Ingenieurverband (alumni organization of Graz University of Technology)
- Senior member IEEE, member IFIP (working group 10.2)

9.2 Journal Editor

- Editor-in-Chief *Telematik* magazine; January 2000 – 2007
- Associate Editor: EURASIP Journal on Embedded Systems. 2011 – ongoing
- Associate Editor: Ad Hoc Networks journal. 2012 – ongoing
- Guest Editor: IEEE Computer special issue on Smart Camera Networks. May 2015
- Guest Editor: ACM Transactions on Embedded Computing Systems special issue on Embedded Aspects of Distributed Smart Cameras. 2011.
- Guest Editor: EURASIP Journal on Embedded Systems special issue on Challenges on Complexity and Connectivity in Embedded Systems. February 2009.
- Guest Editor: The Proceedings of the IEEE special issue on Distributed Smart Cameras. 96(10) October 2008
- Guest Editor: e&i special issue on Networked Embedded Systems. 125(10), October 2008.
- Guest Editor: IEEE Journal on Selected Topics in Signal Processing special issue on Distributed Processing in Vision Networks. 2(4) August 2008.

9.3 Conference Organization

- Steering Committee Member IEEE Workshop on Intelligent Solutions in Embedded Systems (WISES)
- Steering Committee Member for the ACM/IEEE Conference on Distributed Smart Cameras
- Steering Committee Member for the IEEE International Conference on Advanced Video and Signal-Based Surveillance
- Demo Chair for the IEEE International Conference on Multimedia and Expo (ICME) 2015. Torino, Italy 2015
- TPC Co-Chair for the IEEE International Conference on Advanced Video and Signal-Based Surveillance, 2013, Krakow
- General Conference Co-chair for the IEEE International Conference on Advanced Video and Signal-Based Surveillance (AVSS 2011)
- Organizing Chair of the IEEE/ICE Summer School on Networked Embedded Systems, Sep 3-7, 2011, Klagenfurt
- Program Co-Chair IEEE Workshop on Camera Networks and Wide Area Scene Analysis (CVPR Workshop 2011)
- Special Session Chair ACM/IEEE Conference on Distributed Smart Cameras (ICDSC 2009)
- Program Chair Workshop on Embedded Middleware for Smart Camera and Visual Sensor Networks (eMCAM-08)
- General Conference Co-Chair for the ACM/IEEE Conference on Distributed Smart Cameras (ICDSC-07)
- Program Chair Workshop on Distributed Smart Cameras (DSC 2006)
- Program Chair Workshop on Qualitative Reasoning (QR 2005)
- Program Chair Workshop on Intelligent Solutions for Embedded Systems (WISES 2004)

9.4 Membership in Technical Program Committees (TPCs)

- IEEE International Conference on Distributed Computing in Sensor Systems (DCoSS 2014, 2015, 2016, 2017)
- IEEE International Conference on Advanced Video and Signal Based Surveillance (AVSS 2009, AVSS 2010)
- ACM/IEEE International Conference on Distributed Smart Cameras (ICDSC 2008, ICDSC 2009, ICDSC 2010, ICDSC 2011, ICDSC 2012, ICDSC 2013, ICDSC 2014, ICDSC 2015, ICDSC 2016, ICDSC 2017)
- International Conference on Pervasive and Embedded Computing and Communication Systems (PECCS 2011, PECCS 2012, PECCS 2013, PECCS 2014)
- International Conference on Sensor Networks (SENSORNETS 2014)
- IEEE Workshop on Workshop on Advances in Automated Multimedia Surveillance for Public Safety (ICME Workshop 2011, 2012, 2013)
- IEEE Workshop on Embedded Computer Vision (ECV 2008, ECV 2009, ECV 2010, ECV 2011, ECV 2012, ECV 2013, ECV 2014, ECV 2015, ECV 2016, ECV 2017)
- IEEE Workshop on Intelligent Solutions in Embedded Systems (WISES 2005, WISES 2006, WISES 2007, WISES 2008, WISES 2009, WISES 2010, WISES 2011, WISES 2012, WISES 2013, WISES 2014, WISES 2015, WISES 2017)
- IFIP Working Conference on Distributed and Parallel Embedded Systems (DIPES 2008, DIPES 2010)
- Conference D-A-CH Mobility (2006, 2008)
- IEE International Conference on Intelligent Environments (IE 2006, IE 2007, IE 2008, IE 2009, IE 2010, IE 2011)
- IADIS Wireless Applications and Computing Conference (WAC 2007, WAC 2008, WAC 2009, WAC 2010)
- International Workshop on ITS for Ubiquitous Roads (UBIROADS 2007, UBIROADS 2011)
- Workshop on Qualitative Reasoning (QR 2004, QR 2006)
- IEEE International Conference on Computational Cybernetics (ICCC 2004)
- International Workshop on Principles of Diagnosis (DX'02)

9.5 University Appointments

- Member of the Board of the Austrian Science Fund (since 2014)
- Vice Dean of the Faculty of Technical Sciences (January 2008 – December 2011)
- Deputy Head of the Institute of Networked and Embedded Systems (since March 2007)
- Elected Member of the Senate, Klagenfurt University (October 2010 – September 2016)
- Chair of the Doctoral Advisory Board of the Faculty of Technical Sciences (since 2013)
- Chair of the Search Committee for the Professorship in Smart Grids (2015)
- Chair of the Search Committee for the Professorship in Embedded Systems (2013)
- Initiator and coordinator of a Double-Degree Master Program on Pervasive Computing and Multimedia Communications between Klagenfurt University and the University of Udine (effective October 2009)
- University lead coordinator of an Erasmus Mundus Joint Doctorate Program on Interactive and Cognitive Environments between University of Genua, UPC Barcelona, TU Eindhoven, Queen Mary University London and Klagenfurt University (effective October 2010)