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# CURRICULUM VITAE

Andreas Uhl

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## 1 Personal Data

**Name:** Ao.Univ.-Prof. Univ.-Doz. Mag.Dr.rer.nat. Andreas Uhl

**Date and place of birth:** 11. 08. 1968, Braunau/Inn

**Nationality:** Austrian

**Private address:** Söllheimerbachweg 5, A-5023 Salzburg, Tel.: 0662 884211

**Marital status:** Married to DI Dr. Jutta Hämmerle-Uhl, three children (Benjamin W. Vecsei, \* 12.2.1993, Esther Uhl, \* 14.3.1999, and Elias Uhl, \* 4.1.2002).

## 2 Education and Scientific Career

### Education:

1973-1977 VS Braunau/Inn

1977-1986 BG Braunau/Inn (English, Latin, French)

Juni 1986 Matura (passed with distinction).

### University Studies:

WS 86/87 - WS 92/93 Mathematics and secondary school teacher in Mathematics and Philosophy, Psychology, and Educational Theory at the University of Salzburg. Mathematics passed with distinction. Finished: December 1992.

WS 90/91 - SS 92 Two year curriculum in Computer Science (secondary school teacher) at the University of Innsbruck

SS 93 - SS 96 Doctoral program at the University of Salzburg.

Dissertation: Wavelets: Adaptive and Parallel Methods in Image Coding and Signal Processing. (Final examination in April 1996).

Graduation (*"sub auspiciis"*, i.e. *summa cum laudae - in the presence of the Austrian president*): April 1997.

### Scientific Career:

Habilitation for Computer Science in March 2000, title Ao.Univ.-Prof. (tenured Associate Professor at Salzburg University) awarded on October 1st, 2000.

Guest Professor for Computer Science in 2002/2003 at the Johannes Kepler University of Linz (Institute for Pervasive Computing).

Guest Professor for Computer Science in winter term 2003/2004 at Klagenfurt University (Department of Information Technology).

## 3 Research and Scientific Interests

### 3.1 Main Research Topics

- Multimedia data transfer and storage (image and video coding, teleradiology)
- Multimedia security (watermarking, image and video encryption, robust visual hashes)
- Wavelets in image and video processing (JPEG2000, video surveillance systems, medical image analysis)
- Biometrics
- Parallel and distributed processing
- Numbertheoretical numerics and random number generation

### 3.2 Awards

- Award of the Austrian ministry for education, science, and research for distinct studies (1996).
- PhD graduation with distinction *summa cum laudae* in presence of the Austrian president (“Promotion sub auspiciis praesidentiae” (1997)) .
- Sackler-Award of the Salzburg University for medically relevant basic research - telemedicine (1997).
- Heinz Zemanek Award of the Austrian Computer Society for distinguished contributions in computer science (2002).
- Award of the Upper Austrian state government for gifted young scientists (2002).
- Christian Doppler Award (Mathematics) of the Salzburg state government (2004).
- Business Creation Center Salzburg (BCCS) Business Award 2009 (2nd prize) for work from the academic environment with potential to transfer to innovative business solutions.

### 3.3 Research Projects

During my different appointments I have been leader and coworker of several national and international research projects.

- Project leader

- FIT-IT Trust in IT-Systemes Dissertation Grant: BioSurveillance: Single-sensor Biometric Surveillance Combining Iris and Face (March 2009 - February 2012)
- Austrian Science Fund Translational Research Project L554: Sample Data Compression and Encryption in Biometric Systems (Jan 2009 - Dec 2011).
- Austrian National Bank Jubiläumsfonds project no. 12991 (subcontractor of the St. Anna Children’s Hospital Vienna): Computer-assisted evaluation of endoscopic pictures of the duodenal mucosa of children with positive celiac serology (Jan 2009 - Jul 2010).
- Austrian National Bank Jubiläumsfonds project no. 12514 (subcontractor of the Medical University of Vienna): Computer-assisted Pit Pattern Analysis of Colonic Lesion (June 2007 - June 2009).
- Austrian Science Fund-Project P19159: Adaptive Streaming of Secure Scalable Wavelet-based Video (ASSSV) (March 2007 - September 2009, joint project with H. Hellwagner, Klagenfurt University)
- Austrian Science Fund Translational Research Project L366: Computer Assisted Pit-Pattern Classification of Magnifying Endoscopic Colon Images Using Wavelet Techniques (March 2007 - September 2009, joint project with M. Häfner, Medical University of Vienna)
- Austrian Grid Project II (March 2007 - March 2010, joint project with various Austrian partners, led by the University of Linz)
- PitClass: Automatized Pit Pattern Classification of Colon Endoscopic Images (March 2005 - June 2006, joint project with Medical University of Vienna, funded by the Vienna Major Fund for Medical Research)
- FIT-IT Embedded Systemes Project: SPECTACLES – Autonomous Wearable Displays (March 2005 - February 2007, joint project with the University of Linz)
- ECRYPT - IST European Network of Excellence in Cryptology: together with the Technical University of Munich, Magdeburg University and Dresden University as “GAUSS - German-Austrian Multimedia Security Channel” partner in WaviLab (February 2004 - July 2008)
- Austrian Grid Project (October 2004 - October 2006, joint project with various Austrian partners, led by the University of Linz)
- FIT-IT Embedded Systemes Dissertation Grant: Embedded JPEG 2000 based Inter-Frame Video Codec (March 2005 - January 2007)
- Austrian Science Fund-Project 15170: Adaptive Security Techniques for Visual Data in Wavelet-based Representation (January 2002 - June 2006)
- Austrian Science Fund-Project 13903: Parallel Algorithms for Wavelet-based Video Coding (March 2000 - February 2004)

- Industry funded project with Dallmeier Electronic GmbH (Rosenheim, Germany) and DGK (Traunstein, Germany): Wavelet Compression for Video Surveillance Applications (October 1999 - September 2001)
- Project 6900 of the “Jubiläumsfonds” of the Oesterreichische Nationalbank: Fast block-matching algorithms for multimedia applications (April 1998 - October 2000)
- ParWave: Project 11745 of the High Performance Computing Center Stuttgart HLRS (1999 - 2004)
- Paderborn Center for Parallel Computing: Parallel Wavelet/Fractal Compression (1999 - 2004)
- NIC Jülich: Parallel Algorithms for Wavelet-based Video Compression (2000 - 2001)
- Project coordinator (proposal writing, coordination, executive project leader)
  - Austrian Science Fund-Project 13732: Object-based image and video compression with Wavelets (July 1999 - October 2003)
  - Austrian Science Fund-Project 11045: Adaptive, Parallel and Hybrid Wavelet Image Coding (Februar 1996 - Juni 1999)
- Project coworker
  - COOPERATE: Austrian ministry for education, science, and research funded project on “Distributed and Cooperative Working Environments”
  - VROEIG: Austrian ministry for education, science, and research funded project on “Virtual Reality and the Austrian Information Society”
  - PARAGRAPH (Parallel Graphics): Austrian ministry for education, science, and research funded project on parallel computer graphics in the framework of the Austrian Center for Parallel Computation (ACPC).
  - CEI-PACT Project (Programming Environments, Algorithms, Applications, Compilers and Tools for Parallel Computation): Austrian ministry for education, science, and research funded project on parallel processing in the framework of the Central European Initiative (CEI).
  - EERP-Project “Wavelet transform of Rough Surfaces”: Project on the analysis of clean room particle counts and chip surfaces, funded by DEC CEC-Vienna.

### 3.4 Journal Editing and Reviewing

I work as an editor/associate editor for the following journals:

- EURASIP International Journal of Image and Video Processing (Hindawi Publishing)
- International Journal of Image and Graphics (IJIG, World Scientific)
- ETRI Journal
- Advances in Multimedia (Hindawi Publishing)
- Journal of Mobile Multimedia (Rinton Press)
- Journal of Computing and Information Technology (CIT)

I have been acting occasionally as a referee for the following journals: IEEE Transactions on Multimedia, ACM Multimedia Systems Journal, IEEE Transactions on Circuits and Systems for Video Technology, IEEE Signal Processing Letters, IEEE Transactions on Image Processing, IEEE Transactions on Signal Processing, IEEE Transactions on Information Forensics and Security, EURASIP Journal of Applied Signal Processing (JASP), EURASIP Journal on Information Security, Pattern Recognition, IET Computer Vision, IEEE Transactions on Evolutionary Computation, Journal of Mathematical Imaging and Vision, Signal Processing, Signal Processing: Image Communication, International Journal of Computer Mathematics, IEEE Transactions on Information Technology in BioMedicine, IEEE Transactions on Biomechanical Engineering, IEEE Transactions on Parallel and Distributed Systems, Parallel Computing, Parallel Processing Letters, Journal of Parallel and Distributed Computing, Image and Vision Computing, Informatica, ETRI Journal, Journal of Visual Languages and Computing, International Journal of Integrated Computer-Aided Engineering, Pattern Recognition Letters, Computer Methods and Programs in Biomedicine, IEE Proceedings on Vision, Image and Signal Processing, Optical Engineering, Journal of Systems Architecture, IASTED International Journal of Computers and Applications, and Journal of Computing and Information Technology. Additionally I have been acting as a referee for the Springer series Lecture Notes on Computer Science and Lecture Notes in Statistics and for numerous conferences.

I have been a project reviewer for the US National Science Foundation (NSF), for the Swedish Research Council, for the Netherlands Organization for Scientific Research (NWO), for the Institute for the promotion of Innovation by Science and Technology in Flanders (IWT, Belgium), and for the Science & Engineering Research Council (SERC) in Singapore.

### 3.5 Conference Organization

In September 2009, I have been acting as Program chair and main local organizer of the 6th International Symposium on Image and Signal Processing and Analysis ISPA 2009 in Salzburg. I have been acting as general chair and program chair for the 9th IFIP Conference on Communications and Multimedia Security in Salzburg, September 2005. I have been organizing an ECRYPT

summerschool on “Multimedia Security” at Salzburg University in September 2005. In 2001, I have been Co-chair of the 3rd IMACS Seminar on Monte Carlo Methods (MCM 2001) in Salzburg, September 2001. I was Co-chair of the Workshop/Special Session “Parallel and Distributed Image Processing, Video Processing, and Multimedia” (formerly annually held as workshop in the framework of IPDPS – PDIVM 2000 in Cancun, PDIVM 2001 in San Francisco, PDIVM 2002 in Fort Lauderdale, and 2003 in Nice – and then held as special session in the framework of Euromicro PDP, PDIVM 2006 in Montbeliard-Sochaux and PDIVM 2007 in Naples). In 1999, I was special track organizer at ACPC’99 (“Parallel Computing in Image Processing, Video Processing, and Multimedia”). I have been acting as Chairperson of the EuroPar’2000 - 2004 Topic on Multimedia.

I have been member of the program committee of the following conferences:

- “The Second International Conferences on Advances in Multimedia 2010” (Chair: , Athens, Greece, 2010)
- “IASTED Internet and Multimedia Systems and Applications 2010” (Chair: , Sharm El Sheikh, Egypt, 2010)
- “3rd Austrian Grid Symposium” (PC-chairs: Thomas Fahringer and Wolfgang Schreiner, Linz, Austria, 2009)
- “Fifth International Conference on Signal-Image Technology & Internet-Based Systems SITIS 2009 (Information Management and Retrieval Technologies Track IMRT’09)” (PC-IMRT-Chair: R. Chbeir, Marrakech, 2009)
- “The Seventh International Conference on Advances in Mobile Computing & Multimedia (MoMM2009)” (TPChairs: David Taniar and Eric Pardede)
- “17th European Signal Processing Conference (EUSIPCO 2009)” (TPC-Chairs: Stephan Weiss and Patrick Naylor)
- “5th International Symposium on Visual Computing ISVC09” (Computer Vision Chairs: K. Yoshinori and W. Junxian, Las Vegas, USA)
- “13th IASTED International Conference on Internet and Multimedia Systems and Applications (IMSA 2009)” (Chair: S. Panchanathan, Honolulu, USA, 2009)
- “First International Conference on Advances in Multimedia (MMEDIA 2009)” (Chair: Pascal Lorenz, Colmar, France, 2009)
- “6th International Conference on Advances in Mobile Computing & Multimedia 2008 (MoMM 2008)” (Chair: G. Kotsis, Linz, 2008)
- “4th International Symposium on Visual Computing ISVC08” (Computer Vision Chairs: R. Paolo, P. Fatih, Las Vegas, USA)

- “Fourth International Conference on Signal-Image Technology & Internet-Based Systems SITIS 2008 (Information Management and Retrieval Technologies Track IMRT’08)” (PC-IMRT-Chairs: V. Oria, D. Kerami, Bali, 2008)
- “International Conference on Computer Gaming, Animation, Virtual Reality and Allied Technology” (Chair: Stephen Martin, Singapore, 2008)
- “International Conference on Systems and Networks Communications IC-SNC’08 (MCSYS Track)” (Chairs: D. Davcev, J. Kohlenberg, Malta, 2008)
- “32nd Annual Workshop of the Austrian Association for Pattern Recognition 2008 (AAPR/ÖAGM)” (Chair: A. Kuijper, Linz, 2008)
- “12th IASTED International Conference on Internet and Multimedia Systems and Applications (IMSA 2008)” (Chair: M. Mandal, Kailua-Kona, USA, 2008)
- “9th International Workshop on Image Analysis for Multimedia Interactive Services WIAMIS 2008” (PC-Chairs: H. Hellwagner, F. Pereira, S. Kollias, Klagenfurt, 2008)
- “International Conference on Signal-Image Technology & Internet-Based Systems SITIS 2007 (Information Management and Retrieval Technologies Track IMRT’07)” (PC-Chairs: L. Chen, H. Ishikawa, L. Jianzhong, Shanghai, 2007)
- “Third NoE ECRYPT Wavila Challenge (WaCha’07)” (St. Malo, 2007)
- “International Conference on Advances in Mobile Computing & Multimedia 2007 (MoMM 2007)” (Chair: G. Kotsis, Jakarta, 2007)
- “5th Int’l Symposium on Image and Signal Processing and Analysis (ISPA 2007)” (Chairs: Aytul Ercil, Sven Loncaric, Istanbul, 2007)
- “2007 International Conference on High Performance Computing & Simulation (HPCS’07)” (Program Chair: Waleed Smari, Prague, 2007)
- “11th IASTED International Conference on Internet and Multimedia Systems and Applications (IMSA 2007)” (Chair: A. Hac, Honolulu, USA, 2007)
- “31st Annual Workshop of the Austrian Association for Pattern Recognition 2007 (AAPR/ÖAGM)” (Chair: W. Ponweiser, Krumbach, 2007)
- “2nd Austrian Grid Symposium” (Chair: Jens Volkert, Innsbruck, 2006)
- “International Conference on Systems and Networks Communications IC-SNC’06 (MCSYS 2006 Track)” (PC-Chair: P. Castillo, Tahiti, French Polynesia, 2006)

- “International Conference on Signal-Image Technology & Internet-Based Systems SITIS 2006 (Information Management and Retrieval Technologies Track)” (PC-Chairs: H. Kosch, V. Oria, Hammamet, 2006)
- “IFIP International Conference on Communications and Multimedia Security (CMS) 2006” (PC-Chairs: H. Leitold, E. Markatos, Crete, 2006)
- “International Conference on Advances in Mobile Multimedia 2006” (Chair: G. Kotsis, Yogyakarta, 2006)
- “2nd International Conference on High Performance Computing and Communications (HPCC-06)” (Chair: Michael Gerndt, Munich, 2006)
- “The 2006 High Performance Computing & Simulation (HPCS’06) Conference” (Chair: Waleed S. Smari, Bonn, 2006)
- “Annual Workshop of the Austrian Association for Pattern Recognition 2006 (OEAGM)” (Chair: O. Scherzer, Obergurgl, 2006)
- “1st Austrian Grid Symposium” (Chair: Jens Volkert, Hagenberg, 2005)
- “Joint Hungarian-Austrian Conference on Image Processing and Pattern Recognition 2005” (Chairs: D. Chetverikov, M. Vincze, Veszprem, 2005)
- “The 2005 High Performance Computing & Simulation (HPC&S) Conference” (Chair: Helen Karatza, Riga, 2005)
- “4th Int’l Symposium on Image and Signal Processing and Analysis (ISPA 2005)” (Chairs: Hrvoje Babic, Maurice Bellanger, Zagreb, 2005)
- “International Conference on Advances in Mobile Multimedia 2005” (Chair: G. Kotsis, Kuala Lumpur, 2005)
- “International Conference on Multimedia Communications Systems ICMCS 2005” (Chair: Petre Dini, Montreal, 2005)
- “Parallel and Distributed Computing Systems PDCS 2004” (Chair: Waleed S. Smari, San Francisco, 2004)
- “Digital Imaging in Media and Education (28th annual workshop of the Austrian Association for Pattern Recognition (OAGM/AAPR))” (Chair: W. Burger, J. Scharinger, Linz, 2004)
- “Workshop on OpenMP Applications and Tools 2004” (Chair: B. Chapman, Houston, 2004)
- “International Conference on Advances in Mobile Multimedia 2004” (Chair: G. Kotsis, Bali, 2004)
- “Third International Conference on Image and Graphics 2004” (Chairs: Y. Pan, C.-K. Poon, N. Thalmann, H. Shum, Hong Kong, 2004)

- “IEEE R8-EURASIP Symposium on Image and Signal Processing and Analysis” (Chair: A. Neri, H. Babic, Rome, 2003)
- “International Conference on Parallel Processing 2003” (Chair: Ming T. Liu, Jer-Nan Juang, Jhing-Fa Wang, Kaohsiung, 2003)
- “International Conference on Advances in Mobile Multimedia 2003” (Chair: G. Kotsis, Jakarta, 2003)
- “IEEE International Conference on Electronics, Circuits and Systems ICECS 2002” (Chair: Adrijan Baric, Dubrovnik, 2002)
- “Parallel and Distributed Computing Systems PDCS 2002” (Chair: Ghulam Chaudhry, Louisville, 2002)
- “IEEE R8-EURASIP Symposium on Image and Signal Processing and Analysis” (Chair: S. Loncaric, H. Babic, Pula, 2001)
- “IEEE Conference on Intelligent Systems” (Chair: E. Pissaloux, Paris, 2001)
- “9th Euromicro Workshop on Parallel and Distributed Processing” (Chair: Konrad Klöckner, Mantua, 2001)
- “Multimedia Hardware Architectures” (Chair: S. Pachanathan, San Jose, 2000)
- “International Symposium on Computational Intelligence” (Chair: V. Kvasnicka, Kosice, September 2000)

Additionally, I have been session chair at numerous international conferences, and have been organizing chair of ACPC’99.

### 3.6 Invited Talks

Besides invited talks at several Austrian university departments (e.g. GUP at Linz University, NUHAG at Vienna University), I have given the following invited talks:

- Multimedia Security (@ SatNEx-II Summerschool 2009, Salzburg, August 2006).
- Scalable Encryption of Visual Data: JPEG2000 as an Example (@ University of Passau, Passau, June 2007).
- Multimedia Security (@ SatNEx-II Summerschool 2006, Salzburg, August 2006).
- Media Encryption (@ ECRYPT Summerschool on Multimedia Security, Salzburg, September 2005).

- Parallel and Distributed Processing of Visual Content: Traditional Views and New Directions (@ 13th Euromicro Conference on Parallel, Distributed and Network-based Processing, Lugano, February 2005).
- Invitation to give a Tutorial on Multimedia Security at MMNS 2004, the 7th International Conference on Management of Multimedia Networks and Services (declined due to unacceptable financial conditions).
- Wavelet Image and Video Compression on Parallel Architectures. (@ IEEE R8-EURASIP Symposium on Image and Signal Processing and Analysis, Pula, June 2001).
- Parallel Matching Pursuit Algorithms (@ 1st International AURORA Conference (IAC 2000), Vienna, January 2000).
- Parallel Algorithms for Wavelet-Transformation (@ Workshop on Modelling and Analysis, Munich, October 1999).
- Image and Video Compression: Current and Future Standards, Alternatives, and High Performance Computing (@ International Workshop on Advanced Graphics and Multimedia Systems, Naples, November 1998).
- Wavelets: Hybride Image Compression and Parallel Algorithms (@ Colloquium, Technical University of Munich, June 1997).

### 3.7 Conference Participation and Contributed Talks

I have been attending the following conferences and have given the listed talks/presentations:

- 6th International Symposium on Image and Signal Processing and Analysis (ISPA 2009)  
September 2009, Salzburg, Austria.  
Program co-chair, main local organizer & Talk: Evolutionary Optimization of JPEG Quantization Tables for Compressing Iris Polar Images in Iris Recognition Systems.
- 12th International Information Security Conference (ISC'09)  
September 2009, Pisa, Italy.  
Talk: Cancelable iris Biometrics using Block Re-mapping and Image Warping
- ESGA Seminar on Endoscopic Detection of Early Neoplasias in the Gastrointestinal Tract  
July 2009, Salzburg, Austria.
- 16th International Conference on Digital Signal Processing (DSP 2009)  
July 2009, Santorini, Greece.  
Session Chair & Talk: Block Selective Motion Estimation for Low-Complexity Video Coding.

- ECS10: Stereology and Image Analysis – 10th European Congress of ISS  
June 2009, Milano, Italy.  
Talk: Differential Frame Analysis And Selective Motion Estimation Approach for An Inter-Frame JPEG2000 Video Coding System
- 3rd International Conference on Biometrics (IAPR/IEEE ICB'09)  
June 2009, Alghero, Sardinia, Italy.  
Presentations: Improving compressed iris recognition accuracy using JPEG2000 RoI coding & Custom Design of JPEG quantization tables for compressing iris polar images to improve recognition accuracy.
- 24th IFIP International Information Security Conference 2009 (IFIP SEC09)  
May 2009, Paphos, Cyprus.  
Talk: Custom JPEG Quantization for Improved Iris Recognition Accuracy.
- 3rd Pacific Rim Symposium on Image and Video Technology (PSIVT) 2009  
January 2009, Tokyo, Japan.  
Session Chair & Presentation: Usefulness of Retina Codes in Biometrics.
- 10th ACM Workshop on Multimedia and Security (MMSEC'08)  
Septmeber 2008, Oxford, UK.  
Talk: Multiple Re-Watermarking using varying non-stationary MRA with parameterized wavelet filters.
- The 8th IASTED International Conference on Visualization, Imaging, and Image Processing (VIIP 2008)  
September 2008, Palma de Mallorca, Spain.  
Talk: Attack against a JPEG2000-based robust hash for content identification.
- The 4th IET International Conference on Advances in Medical, Signal and Information Processing (MEDSIP 2008)  
July 2008, Santa Margherita Ligure, Italy.  
Talk and Presentation: One-Against-One Classification for Zoom-Endoscopy Images & Towards Automated Diagnosis of Celiac Disease by Computer-Assisted Classification of Duodenal Imagery.
- International Conference on Image and Signal Processing 2008 (ICISP 2008)  
July 2008, Cherbourg-Octeville, France.  
Talk: Personal Recognition using single-sensor multimodal hand biometrics.
- IEEE International Conference on Multimedia and Expo (ICME'08)  
June 2008, Hannover, Germany.  
Session chair & Presentation: Multiple Re-Watermarking using varying wavelet packets.

- 5th International Conference on Informatics in Control, Automation and Robotics (ICINCO'08)  
May 2008, Funchal, Madeira, Portugal.  
Presentation: Rotation-invariant iris recognition: boosting 1D spatial-domain signatures to 2D.
- IEEE International 3rd International Symposium on Communications, Control and Signal Processing (ISCCSP'08)  
March 2008, St. Juliens, Malta.  
Talk: Color Wavelet Cross Co-Occurrence Matrices for Endoscopy Image Classification.
- IEEE International Conference on Signal Processing and Communications (ICSPC '07)  
November 2007, Dubai, UAE.  
Session Chair & Talk: Partial Encryption Schemes for Matching Pursuit.
- 7th International Conference on Wavelet Analysis and Multirate Systems (WAMUS 2007)  
October 2007, Arcachon, France.  
Session chair & Talks: Improving Security of JPEG2000-Based Robust Hashing using Key Dependent Wavelet Packet Subband Structures & Statistical and Structural Wavelet Packet Features for Pit Pattern Classification in Zoom-Endoscopic Colon Images.
- 5th International Symposium and Image and Signal Processing and Analysis (ISPA 2007)  
September 2007, Istanbul, Turkey.  
Session Chair & Talk: Comparison of k-NN, SVM, and NN in Pit Pattern Classification of Zoom-Endoscopic Colon Images using Co-Occurrence Histograms.
- IEEE International Workshop on Machine Learning for Signal Processing (MLSP 2007)  
August 2007, Thessaloniki, Greece.
- 20th IEEE International Symposium on Computer Based Medical Systems (CBMS 2007)  
June 2007, Maribor, Slovenia.  
Talk: Pit Pattern Classification of Zoom-endoscopic Colon Images using DCT and FFT.
- Information Hiding 2007 & ECRYPT WaCha'07  
June 2007, St. Malo, France.  
PC-member WaCha 2007.
- Euromicro Conference on Parallel, Distributed, and Network Based Processing (PDP 2007)

February 2007, Naples, Italy.

PDIVM Special Session organizer and Session Chair.

- IFIP Communications and Multimedia Security (CMS 2006)  
October 2006, Crete, Greece.  
Talk: Compression of encrypted visual data.
- ACM Multimedia and Security Workshop (MM-SEC 2006)  
September 2006, Geneva, Switzerland.  
Session chair, Talk: Robustness and security of a wavelet-based CBIR hashing algorithm.
- 13th International Conference on Systems, Signals, and Image Processing (IWSSIP 2006)  
September 2006, Budapest, Hungary.  
Session chair, Talk: Video encryption exploiting non-standard 3D data arrangements.
- International Conference on Information Security (ISC 2006)  
September 2006, Samos, Greece.  
Talk: Transparent Image Encryption using Progressive JPEG.
- International Conference on Advances in Medical Signal and Image Processing (MEDSIP 2006)  
July 2006, Glasgow, UK.  
Posters: Computer Assisted Morphometric Analysis of TEM Images & Pit pattern classification of zoom-endoscopic colon images using wavelet texture features.
- 7th Nordic Signal Processing Symposium (NORSIG 2006)  
June 2006, Reykjavik, Iceland.  
Session chair, Talks: Pit pattern classification of zoom-endoscopic colon images using histogram techniques & On the significance of the zerotree hypothesis for wavelet-based image coding.
- International Conference on Information, Communication and Signal Processing (ICICS 2005)  
December 2005, Bangkok, Thailand.
- International Conference on Image Analysis and Processing (ICIAP 2005)  
September 2005, Cagliari, Italy.  
Talk: Lightweight protection of visual data using high-dimensional wavelet parametrization, Poster: Security enhancement of visual hashes through key dependent wavelet transformations.
- Visual Communications and Image Processing (VCIP 2005)  
July 2005, Beijing, China.  
Talk: Performance Analysis of Block-based Permutations in Securing JPEG2000 and SPIHT Compression.

- 5th EURASIP Conference focused on Speech and Image Processing, Multimedia Communications and Services (EC-SIP-M 2005)  
June/July 2005, Smolenice, Slovak Republic.  
Talks: Experimental Study on Scan Order and Motion Compensation in Lossless Video Coding & Transparent Encryption of JPEG 2000 Bitstreams.
- International Workshop on Parallel Numerics (ParNum 2005)  
April 2005, Portoroz, Slovenia.  
Session Chair, Talk: Limitations of Cluster Computing.
- Internationales Rechtsinformatik Symposium (IRIS 2005)  
Februar 2005, Salzburg, Austria .  
Vortrag: Rechtsunsicherheit durch digitale Signaturen fr Multimedia?
- IEEE International Conference on Image Processing (ICIP 2004)  
October 2004, Singapore.  
Poster: Encryption of Wavelet-Coded Imagery using Random Permutations.
- XII European Signal Processing Conference EUSIPCO 2004  
September 2004, Vienna, Austria.  
Talk: Comparison of JPEG and JPEG 2000 in Low-Power Confidential Image Transmission, Poster: Layered Encryption Techniques for DCT-coded Visual Data.
- EuroPar 2004  
August 2004, Pisa, Italy.  
High Performance Multimedia Track Vice Chair, Talk: Dynamic Granularity Switching in Parallel Block-Matching Motion Compensation.
- IEEE International Conference on Multimedia and Expo (ICME 2004)  
June 2004, Taipei, Taiwan.  
Session Chair, Talk: Robustness against Unauthorized Watermark Removal Attacks via Key-dependent Wavelet Packet Subband Structures, Poster: Lightweight JPEG 2000 Confidentiality for Mobile Environments.
- Nordic Signal Processing Symposium (NORSIG 2004)  
June 2004, Espoo, Finland.  
Session Chair, Talks: Wavelet-Packet Subband Structures in the Evolution of the JPEG 2000 Standard & Robust Authentication of the JPEG 2000 Bitstream.
- International Conference on Computational Science and its Applications (ICCSA 2004), May 2004, Assisi, Italy.  
Talk: Distributed Optimization of Fiber Optic Network Layout using MATLAB.
- Int.Conf. on Software Engineering, Parallel and Distributed Systems (SEPADS 2004)

February 2004, Salzburg, Austria.

Talk: Observations on Data Distribution and Scalability of Parallel and Distributed Image Processing Applications.

- Communications and Multimedia Security CMS 2003  
October 2003, Torino, Italy.  
Talks: Watermark Security via Secret Wavelet Packet Subband Structures & Selective Encryption of the JPEG2000 Bitstream.
- IMACS Seminar on Monte Carlo Methods (MCM 2003)  
September 2003, Berlin, Germany.  
Talks: Measures of Uniform Distribution in Wavelet Based Image Compression & Normalization of the Spectral test in High Dimensions.
- ParCo 2003  
September 2003, Dresden, Germany.  
Talks: Parallel Overlapped Block-Matching Motion Compensation Using MPI and OpenMP & Wavelet-Based Still Image Coding Standards on SMPs using OpenMP.
- EuroPar 2003  
August 2003, Klagenfurt, Austria.  
Multimedia Track Local Chair.
- Visual Communications and Image Processing 2003  
July 2003, Lugano, Switzerland.
- Iberian Conference on Pattern Recognition and Image Analysis (IbPRIA 2003)  
June 2003, Puerto d'Andrax, Mallorca, Spain.  
Talk: Robust Hash-Functions for Visual Data: An Experimental Comparison.
- ACM Multimedia 2002  
Dezember 2002, San Juan Les Pins, France.  
Talk: Application scenarios for selective encryption of visual data.
- ParNum 2002  
October 2002, Bled, Slovenia.  
Talk: Communication patterns in MPI based parallel block-matching.
- IEEE Nordic Signal Processing Symposium 2002  
October 2002, Tromsø/Trondheim, Norway.  
Talk: Selective bitplane encryption for secure transmission of image data in mobile environments.
- EuroPVM/MPI 2002  
September 2002, Linz, Austria.  
Talk: Granularity levels in parallel block-matching motion compensation.

- Communications and Multimedia Security CMS 2002  
September 2002, Portoroz, Slovenia.  
Talk: Selective encryption of visual data.
- EuroPar 2002  
August 2002, Paderborn, Germany.  
Multimedia Track Global Chair.
- Workshop on Multimedia Security and Watermarking  
May 2002, Vienna, Austria.  
Talk (German): Sicherheit für Wavelet Watermarks durch Filterparametrisierung.
- Third Benelux Signal Processing Symposium SPS 2002  
March 2002, Leuven, Belgium.  
Poster: New Models for Generating Optimal Wavelet-Packet-Tree-Structures.
- International Conference on Image Processing ICIP 2001  
October 2001, Thessaloniki, Greece.  
Poster: Watermark security via wavelet filter parametrization.
- International Symposium on Signal and Image Processing and Analysis  
ISPA 2001  
Juni 2001, Pula, Croatia.  
Talks: Wavelet Image and Video Coding on Parallel Architectures & oS-  
PIHT - Embedded Object-based SPIHT Image Coding & A Remark on  
the Interplay between Image Compression and Watermark Embedding  
Techniques.
- Communications and Multimedia Security CMS 2001  
May 2001, Darmstadt, Germany.
- International Parallel and Distributed Processing Symposium IPDPS 2001  
April 2001, San Francisco, USA.  
PDIVM 2001 Chair.
- Evolutionary Computation EC'01  
February 2001, Puerto de la Cruz (Tenerife), Spain.  
Session Chair.
- Monte Carlo and Quasi-Monte Carlo Methods in Scientific Computing  
MCQMC 2000  
November 2000, Hong Kong, China.  
Talk: Defects in parallel Monte Carlo and Quasi-Monte Carlo integration
- ParNum 2000  
September 2000, Bratislava, Slovakia.  
Talk: Parallel Monte Carlo and Quasi-Monte Carlo Integration: the Leap-  
Frog Case.
- International Conference on Pattern Recognition ICPR 2000  
September 2000, Barcelona, Spain.

Talk: Resolving a Defect in Quadrant-based Classification for Fast Block-Matching.

- EuroPar 2000  
August 2000, Munich, Germany.  
Multimedia Track Global Chair.
- Monte Carlo Simulation MCS 2000  
June 2000, Monte Carlo, Monaco.
- International Parallel and Distributed Processing Symposium IPDPS 2000  
May 2000, Cancun, Mexico.  
PDIVM 2000 Chair.
- EuroPar'99  
August 1999, Toulouse, France.  
Talk: Parallel Wavelet Transforms on Multiprocessors.
- 2nd IMACS Seminar on Monte Carlo Algorithms and Applications  
Juni 1999, Varna, Bulgaria.  
Talk: Techniques for parallel quasi-Monte Carlo integration and associated problems.
- Parallel Computation. 4th International Conference of the ACPC (ACPC'99)  
February 1999, Salzburg, Austria.  
Talk: Classification Based Speed-up Methods for Fractal Image Compression on Multicomputers.
- 12th Workshop on Parallel and Distributed Simulation (PADS'98)  
May 1998, Banff, Canada.  
Talk: Linear and Inversive Pseudorandom Numbers for Parallel and Distributed Simulation.
- Wavelets and Multiscale Methods (IWC'98)  
April 1998, Tanger, Maroc.  
Talk: Evolving Subband Structures for Wavelet Packet based Image Compression using Genetic Algorithms with Non-additive Cost Functions.
- Multimedia Hardware Architectures 1998  
Januar 1998, San Jose, CA.  
Talk: Improving the efficiency of parallel fractal compression using localized domain-pools.
- Visual Communications and Image Processing '98 (VCIP'98)  
January 1998, San Jose, CA.  
Talk: Predictive and direct fractal quantization of the wavelet packet domain.
- Parallel Computing 1997 (ParCo'97)  
September 1997, Bonn, Germany.  
Talk: Fractal Compression of Satellite Images: Combining Parallel Processing and Geometric Searching.

- International Picture Coding Symposium (PCS'97)  
September 1997, Berlin, Germany.  
Talks: Comparison of Wavelet, Fractal, and DCT based Methods on the Compression of Prediction-error Images & Enhancing wavelet image compression by partial fractal coding of spatial self-similarities.
- International Workshop Parallel Numerics 1997 (ParNum'97)  
September 1997, Zakopane, Poland.  
Talk: Parallel Computing in Cryptanalysis: Experiences in a Graduate Students' Project.
- International Conference on Parallel Processing and Applied Mathematics (PPAM'97)  
September 1997, Zakopane, Poland.  
Talk: Fractal Image Compression on Multiprocessors and Multicomputers.
- Sixth international Conference on Image Processing and its Applications (IPA'97)  
July 1997, Dublin, Ireland.  
Talk: Double tree wavelet image compression on parallel MIMD architectures.
- High Performance Computing and Networking (HPCN Europe 1997)  
Aprli 1997, Vienna, Austria.  
Talk: Hybrid fractal/wavelet image compression in a high performance computing environment.
- Visual Communications and Image Processing '97 (VCIP'97)  
February 1997, San Jose, CA.  
Talks: Issues in Implementing Block-Based Image Compression Techniques on Parallel MIMD Architectures & Approaching Real-Time Processing for Fractal Compression.
- EuroPVM'96  
Oktober 1996, Munich, Germany.  
Talk: Parallel Image Compression on a Workstationcluster Using PVM.
- International Conference of the ACPC'96  
September 1996, Klagenfurt, Austria.  
Talk: Parallel Computation of Optimal Parameters for Pseudo Random Number Generation.
- International Workshop Parallel Numerics'96  
September 1996, Gozd Martuljek, Slovenia.  
Talk: Adaptive Quadtree based Wavelet Packet Image Block-Coding on MIMD parallel architectures.
- EuroPar'96  
August 1996 , Lyon, France.

Talk: Parallel algorithms for using non-stationary MRA in image compression.

- Wavelet Applications III  
April 1996, Orlando, FL.  
Talk: Adaptive wavelet image block coding.
- International Picture Coding Symposium 1996  
March 1996, Melbourne, Australien.  
Talk: Wavelet Image Block Coding: Adaptive Methods and Parallel Implementation.
- International Conference on Visual Information Systems  
Februar 1996, Melbourne, Australia.  
Talk: Parallel Algorithms for Fractal Image Coding on MIMD Architectures.
- International Conference on High Performance Computing  
December 1995, New Delhi, India.  
Talk: A parallel wavelet image block-coding algorithm.
- International Workshop Parallel Numerics '95  
September 1995, Sorrento, Italy.  
Talk: The Best Basis and Local Discriminant Bases Algorithms on Moderate Parallel MIMD Architectures.
- Irregular'95  
September 1995, Lyon, France.  
Talk: Adapted wavelet analysis on moderate parallel distributed memory MIMD architectures.
- Seventh SIAM Conference on PARALLEL PROCESSING for Scientific Computing  
February 1995, San Francisco, CA.  
Talk: Vector and parallel wavelet transforms for the analysis of time-varying signals.
- International workshop on parallel processing  
December 1994, Bangalore, India.  
Talk: Parallel compact coding of satellite images with wavelet packets using PVM.
- Mathematical Imaging: Wavelet applications in signal and image processing II  
July 1994, San Diego, CA.  
Talk: Compact image coding using wavelets and wavelet packets based on non-stationary and inhomogeneous multiresolution analysis.

### 3.8 Scientific Publications

My publications may be assigned to the following scientific fields (the numbers refer to the list of publications given at the end of this curriculum vitae) – accepted but not yet published manuscripts are not listed:

- **Monograph on Image and Video Encryption** [246]
- **Multimedia Signal Processing (Image and Video Coding, Image and Video Processing)**: [224, 223, 231, 234, 232, 236, 3, 237, 112, 5, 189, 4, 63, 175, 190, 64, 99, 101, 102, 193, 61, 194, 139, 22, 195, 153, 23, 160, 161, 196, 191, 197, 110, 201, 239, 203, 32, 33, 202, 29, 121, 206, 204, 205]
- **Multimedia Security (Watermarking, Media Encryption)**: [141, 136, 176, 103, 137, 177, 179, 13, 174, 208, 180, 178, 181, 14, 15, 209, 16, 163, 62, 156, 12, 105, 192, 60, 155, 157, 244, 146, 182, 183, 173, 1, 159, 245, 24, 147, 210, 25, 26, 212, 211, 111, 132, 19, 148, 106, 97, 68, 28, 213, 131, 126, 21, 27, 214, 20, 128, 69, 67, 143, 127, 142, 89, 88, 122, 90, 216, 215, 145, 123, 124, 138, 144, 125]
- **Medical Image Processing**: [6, 7, 2, 8, 149, 76, 78, 65, 73, 74, 75, 129, 120, 77, 252, 72, 71, 119, 130, 91, 70]
- **Biometrics**: [133, 104, 247, 135, 134, 248, 66, 109, 86, 188, 107, 249, 250, 187, 108, 253, 87]
- **Parallel and Distributed Processing**: [79, 80, 81, 225, 228, 229, 227, 226, 233, 241, 235, 230, 243, 242, 240, 45, 58, 83, 82, 98, 46, 47, 48, 59, 51, 84, 85, 114, 116, 49, 113, 100, 44, 117, 50, 118, 115, 150, 52, 42, 43, 56, 140, 152, 151, 55, 53, 218, 154, 217, 184, 185, 162, 54, 57, 171, 186, 164, 172, 170, 219, 220, 158]
- **Numerics** : [222, 9, 238, 31, 40, 39, 199, 41, 10, 198, 200, 35, 36, 37, 207, 34, 30, 38, 92, 93, 94, 95, 96]
- **Editor**
  - Conference Proceedings: [254, 166, 165, 167, 168, 169, 221, 251, 17, 18, 11]
  - Journal Special Issues
    - \* *Mathematics and Computers in Simulation* special issue on “3rd IMACS Seminar on Monte Carlo Methods MCM 2001”, Vol 62(3-6), March 2003.
    - \* *Parallel Computing* special issue on “Parallel Computing in Image and Video Processing”, Vol 28(7-8), August 2002.
    - \* *Parallel and Distributed Computing Practices* special issue on “Parallel Numerics and Applications”, Vol 5(3), April 2002.

## 4 Teaching

1. Within the framework of the curriculum Applied Computer Science, University of Salzburg (from 1995 onwards)
  - Multimedia Compression
  - Multimedia Data Bases
  - Multimedia Security
  - Biometrics
  - Cryptography and IT Security
  - Image Processing
  - Applied Computer Science: Selected Topics
  - Parallel Processing
  - Foundations of Scientific Working Techniques and Presentation
2. Within the framework of the curriculum Computer Science, Johannes Kepler University Linz (2002/2003)
  - Selected Topics in Pervasive Computing: Multimedia Data Formats
  - Selected Topics in Pervasive Computing: Mobile Multimedia
3. Within the framework of the curriculum Computer Science, Klagenfurt University (2003/2004)
  - Multimedia Security
4. Carinthia Tech Institute (from 1999 onwards)
  - Compression Technology
  - Multimedia I
  - System Security
5. Salzburg University of Applied Sciences (from 2007 onwards)
  - Multimedia Security
6. Within the framework of the curriculum Mathematics, University of Salzburg (until 1995)
  - Mathematical Software
  - Numerical Mathematics
  - Numbertheoretical Numerics
  - Differential Equations

Besides teaching, I am also advisor of Master and PhD Theses:

- PhD Theses:

- Dominik Engel: Media encryption for still visual data - an analysis of selected techniques for natural images and fingerprint data in the spatial and wavelet domain (2008)
  - Roland Norcen: Performance and Security Issues in Transformation Based Image and Video Coding (2003)
  - Andreas Pommer: Selective Encryption of Wavelet-compressed Visual Data (2003)
  - Rade Kutil: Wavelet Domain based Techniques for Video Coding (2002)
  - Manfred Feil: Parallel Wavelet Packet Based Video Coding (2001)
  - Thomas Schell: Evolutionary Optimization: Selection Schemes, Sampling and Applications in Image processing and Pseudo Random Number Generation (2001)
- Master Theses:
    - Michael Gschwandtner: Efficient protection and access control of 3D geometry data (2009)
    - Christian Koidl: Multiple blind watermarking in the DRM context (2009)
    - Franz Mayringer: Methoden und Anwendungen der digitalen Sprachverarbeitung in der experimentellen Audiologie (2009)
    - Bernhard Mühlbacher: Wavelet Packets Optimization in JPEG2000 using the example of fingerprints (2009)
    - Elias Pschernig: Cancelable biometrics for iris detection with parameterized wavelets and wavelet packets (2009)
    - Karl Raab: Watermarking in Scalable Media and in Biometrics (2009)
    - Philipp Venningen: Developing Software to burn full DDP images onto DVD recordable discs (2009)
    - Leonhard Brunauer: Pit Pattern Classification and Feature Selection for Colon Cancer Diagnosis using Fourier Filters (2008)
    - Thomas Fuhrmann: Automated Diagnosis of Celiac Disease by Classification of Duodenal Imagery (2008)
    - Christian Rathgeb: Iris-based Biometric Cryptosystems (2008)
    - Peter Wild: Single-sensor hand and footprint-based multimodal biometric recognition (2008)
    - Gerwin Fleischmann: Computer Aided Wafer Inspection: Integration of a CCD-camera module and investigation of image processing methods for supporting human operator's work (2007)
    - Heinz Hofbauer: Improper Integrals and QMC Integration in a Grid Environment (2007)

- Christian Kastinger: Automatic Classification of Simulated Radar Range Profiles and Zoom-endoscopic Colon Images (2007)
- Gerold Laimer: Security of Perceptual Hash Functions (2007)
- Gerald Leimhofer: Selective Encryption with Matching Pursuit Projection (2007)
- Michael Liedlgruber: Pit Pattern Classification in Colonoscopy using Wavelets (2006)
- Thomas Stütz: Securing Scalable Visual Data in a Grid Environment (2006)
- Hartmut Wernisch: Multiple Watermarking for Digital Rights Management (2006)
- Thomas Berger: Analyse aktueller VPN Technologien in Bezug auf kryptographische Methoden, Performance und Tunnelmanagement (2005)
- Andreas Radermacher: Spam Prevention in Voice over IP Networks (2005)
- Michael Brachtl: Verteilte elektronische Vertragsabschlüsse und deren praktische Implementierbarkeit (2003)
- Werner Dietl: Improving the Security of Wavelet-based Watermarking Systems (2003)
- Albert Meixner: Methods of Protecting Image Integrity (2003)
- Dominik Engel: Adaptive objectoriented image compression with wavelet methods (2002)
- Florian Tischler: On parallel block-matching for digital video processing (2002)
- Harald Flatscher: Adaptive and object-based image and video compression using wavelets (2001)
- Peter Meerwald: Digital image watermarking in the wavelet transform domain (2001)
- Roland Norcen: Parallel implementations of matching pursuit projection (2001)
- Matthias Reichl: Fractal quantizers for the wavelet transform domain (2001)
- Markus Reisecker: The JPEG2000 standard and its implementation in the Verification Model 6.0 (2001)
- Rudolf Schürer: High-dimensional numerical integration on parallel computers (2001)
- Walter Gruber: EEG-signal analysis: From traditional methods to analytic wavelets (2000)
- Brigitte Jellinek: Invisible watermarking for digital image copyright protection (2000)

- Rade Kutil: High dimensional wavelet transforms on MIMD architectures (2000)
- Andreas Pommer: Fractal Video Compression — Basics, 2D, 3D and Parallel Algorithms (1999)
- Peter Schneider: Matching Pursuit Image and Video Compression - Speedup Techniques (1999)
- Manfred Feil: Wavelet transforms on parallel architectures (1998)
- Christian Hufnagl: Efficient motion estimation algorithms for digital video compression (1998)
- Alfred Bruckmann: Selective and hybrid image compression with wavelet methods (1997)

## References

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