

Curriculum Vitae

Personal information

	Dr.-Ing. Till Halbach
Birth	1973 in Düsseldorf , Germany
Nationality	German
Marital status	Samboer, one child
Position	Research scientist
Affiliation	Norwegian Computing Center
Memberships	IEEE incl. Signal Processing Society, Tekna , and NORSIG
Grants	Norwegian Research Council (internat. scholarship, 08/2002–01/2003), IKT Webtek (Ph.D. grant, 04/2002–03/2004), the department (Ph.D. grant, 09/1999–03/2002), IENT at RWTH (travel grants, 1999, 2000, and 2001), SINTEF (study grant, 03–09/1999), and European student exchange program Sokrates (student exchange grant, 04–12/1998)
References	Please contact Tor A. Ramstad at NTNU or Snorre M. Grimsby at Opera Software (contact information available upon request)

Main fields of competence

Web standards, scalable web sites, web applications

Quality assurance systems and processes

Still-image and video communication, including international standards

Channel error robustness, including channel coding, resilience, and concealment, and joint source channel coding

Multiresolution image processing

Work experience and training

Since 06/2007	Research scientist at Norwegian Computing Center in Oslo (Norway) Applied research; Multimedia compression, streaming, and broadcasting (video and audio); e-inclusion, web markup and style, accessibility, content scalability, web applications; software development (Java, JavaScript, PHP); system virtualization; consulting
07/2006–05/2007	Project and test manager at Opera Software in Oslo Opera-internal Core technology product deliveries; Deputy Core QA manager
05–06/2006	Core technology engineer at Opera Software's Korean office in Seoul Project-specific tasks

- 01/2005–04/2006 Quality assurance engineer at Opera Software in Oslo
General and scalable multimedia cross-platform rendering (including handheld devices), image decoding, browser security, and development of quality assurance tools and systems; participation in development of web standards; Deputy Core QA manager
- 10–12/2004 Trainee at Opera Software in Oslo and Linköping (Sweden)
Software and device testing, browser security, and multimedia rendering; Deputy Core QA manager
- 06/2000–07/2002 Contributor to H.264 standardization of [ITU-T](#)
Improvement of the standard's error resilience
- 04–12/1998 Contributor to JPEG2000 standardization of [ISO/IEC](#)
Enhancement of the standard's error robustness
- 01–03/1998 Professional internship at [Rohde&Schwarz](#) GmbH&Co. KG in [Munich](#), Germany
A hardware implementation of a channel codec for MPEG-2 Video / DVB-T
- 10/1995–05/1997 Student assistant at Institute for Communications Engineering ([IENT](#)), University of Science and Technology ([RWTH](#)), in [Aachen](#), Germany
Development of software tools for video compression

Post-secondary education

- 08/2002–01/2003 Visiting scholar at the School of Electrical Engineering and Computer Science ([EECS](#)), Washington State University ([WSU](#)), in [Pullman](#) (WA, USA), with dr. Thomas R. Fischer as local supervisor
Development of an SNR scalability extension for H.264 as well as research on optimum channel coding for hybrid code streams
- 06–09/2001 Visiting scientist at IENT, with Prof. J.-R. Ohm as local adviser
Research on increased error robustness of H.26L
- 06–08/2000 Visiting scientist at IENT
Project participation concerning adaptive block transforms in H.26L
- 09/1999–07/2004 Ph.D. (dr.ing.) student at [Department of Electronics and Telecommunications](#) (former Department of Telecommunications), Norwegian University of Science and Technology ([NTNU](#)) in [Trondheim](#), Norway, with Prof. Tor A. Ramstad as supervisor
Main research area: Robust still-image and video compression
- 06–07/1999 Visiting scientist at IENT with Prof. H.-D. Lüke as local adviser
Research on a modification of JPEG2000 for increased channel error resilience
- 03–09/1999 Scientist (stipendiat) at [SINTEF](#) in Trondheim
Area of research: Robust image compression in JPEG2000
- 04–12/1998 Diploma (M.Sc.) thesis at Department of Telecommunications, NTNU, with Prof. Tor A. Ramstad as local supervisor
Participation in the Core Experiment Development Group for increased error robustness of JPEG2000

02/1995	Finishing undergraduate studies with Vordiplom. Start of Philosophy as minor subject Communications Engineering as field of interest during graduate studies
10/1992–12/1998	Study of Electrical Engineering at RWTH. Graduating with Diplom-Ingenieur degree

Language skills

German	Mother tongue
English	Readings skills: excellent; writing skills: excellent; verbal skills: very good
Norwegian	Readings skills: excellent; writing skills: very good; verbal skills: very good

Computer skills

Systems	Windows, Unix (Solaris), Linux (Redhat/Fedora, Debian, Ubuntu), Mac
Languages	ANSI-C, C++, Java, PHP, JavaScript/ECMAScript, Shell programming, Awk, Matlab, Octave
Software development	Eclipse, CVS/SVN, g++, gdb, emacs
Applications	MS Office, Open Office, various Linux programs
Other	\LaTeX , (X)HTML, CSS, various web/ W3C standards

Visual communication standards

Still-image and graphics coding standards	aGIF, GIF, BMP, ICO, JPEG, PNG, SVG, WBMP, XBM, Motion JPEG, JPEG2000, Motion JPEG2000, JPEG-LS, JBIG
Video coding standards	MPEG-1, MPEG-2, MPEG-4, H.120, H.261, H.262, H.263, H.263+, H.263++, H.264

Teaching as scientific assistant

Digital Filtering	Ph.D. level. Lectures, supervised in Autumn 2003. 9 students State-of-the-art digital filter techniques and realizations; non-linear, multirate, and multidimensional filtering; finite-precision effects; signal synthesis; applications
Digital Image Communication	Specialization on a M.Sc. level. Lectures (incl. examinations), held in Autumn 2003. 8 students Multirate signal processing; information-theoretic bounds; signal analysis, classification, and mapping; still-image and video compression; optimum resource allocation; signal decomposition, filter banks, and transforms

Digital Image Communication	M.Sc. level. Tutorials on the upcoming video coding standard H.264, given in Autumn 2001 and Autumn 2002. 16 and 11 students Standardization efforts; encoder and decoder technical issues and concepts including profiles; coding examples; performance comparisons
Communications and Multimedia Seminar	M.Sc. level. Tutorial about Joint Source Channel Coding, given in Spring 2001. Roughly 30 students Information theory issues; conventional systems; joint encoding and decoding; recent research; examples in still-image and video compression
Digital Signal Processing	M.Sc. level. Labs and some lectures (incl. examinations), held in Autumn 1999, Spring 2000, and Spring 2001. Between 80 and 110 students Analog, discrete, and digital signals; signal analysis, modeling, and filtering; estimation and detection theory; LTI systems; signal transforms
Information Theory, Coding, and Compression	M.Sc. level. Labs (incl. examinations), developed and held in Autumn 2000. Around 40 students Communication system structures and modeling; communication theory and information-theoretic bounds; lossless and lossy signal compression; rate distortion theory; signal quantization; channel coding

Other occupations

Peer review of submitted articles for [IEEE Transactions on Image Processing](#), [IEEE Signal Processing Letters](#), and [IEEE Transactions on Multimedia](#), since 2004

Member of Program Committee and article reviewer for the [NORSIG-2005](#) conference
Conference on Signal Processing

Examiner of fifth-year students under oral examination, Autumn 2004
Course topic: Digital Image Communication

Article reviewer for the [NORSIG-2003](#) conference

Supervisor for one fifth-year student writing master's thesis, Spring 2003
Title: 'Håndtering av pakketap i videokonferansesystemer'

Supervisor for one fifth-year student working on short-term project, Autumn 2002
Title: 'Generelle konsepter og feilrobusthet i H.26L'

Assignment from Høyskole i Stavanger for examination of a Diploma thesis, Spring 2002
Title: 'Temporær redundans i videokoderen H.26L'

Supervision of one fifth-year student working on short-term project, Autumn 2001
Title: 'H.26L & feilrobusthet i variabel-lengde-kodere'

Supervisor for two fifth-year students writing master's thesis, Spring 2000

Research area: MPEG-4 Visual

Administrator of the website of Department of Telecommunications, Autumn and Spring 1999/2000, 2000/2001, and 2001/2002

Homepage programming and design, content management

Publications

- PhD thesis Till Halbach. *Error-Robust Coding and Transmission of Compressed Layered Hybrid Video Streams for Packet-Switched Wireless Networks*. PhD thesis, Norwegian University of Science and Technology (NTNU), Trondheim (Norway), 2004.
- Journal articles Till Halbach and Thomas R. Fischer. SNR scalability by coefficient refinement for hybrid video coding. *IEEE Signal Processing Letters*, 13(2):88–91, February 2006.
- Conference articles Till Halbach. Optimum unequal error protection of SNR-scalable DPCM-coded video. In *Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Proc. (ICASSP)*, volume 4, pages 629–632, Montreal (Quebec, Canada), May 2004.
- Till Halbach. Unequal error protection of SNR-scalable DPCM-coded video. In *Proc. Data Compression Conference (DCC)*, Snowbird (UT, USA), March 2004.
- Till Halbach and Steffen Olsen. Error robustness evaluation of H.264/MPEG-4 AVC. In *Proc. SPIE Visual Communications and Image Processing (VCIP)*, San Jose (CA, USA), January 2004.
- Till Halbach. The H.264 video compression standard. In *Proc. Nordic Signal Processing Symposium (NORSIG)*, Bergen (Norway), October 2003.
- Till Halbach and Tor A. Ramstad. Multidimensional adaptive non-linear filters for concealment of interlaced video. In *Proc. Nordic Signal Processing Symposium (NORSIG)*, Bergen (Norway), October 2003.
- Till Halbach and Thomas R. Fischer. SNR scalability by transform coefficient refinement for block-based video coding. In *Proc. SPIE Visual Communications and Image Processing (VCIP)*, Lugano (Switzerland), July 2003.
- Till Halbach and Thomas R. Fischer. Channel rate allocation for error-robust packet transmission of SNR-scalable DPCM-coded video. In *Proc. International Symposium on Signal Processing and its Applications (ISSPA)*, Paris (France), July 2003.
- Till Halbach and Mathias Wien. Concepts and performance of next-generation video compression standardization. In *Proc. Nordic Signal Processing Symposium (NORSIG)*, on board Hurtigruten (Norway), October 2002.

Till Halbach. Motivation for error-tolerant communication. In *Proc. SPIE Visual Communications and Image Processing (VCIP)*, volume 4671 (Part Two), pages 1210–1218, San Jose (CA, USA), January 2002.

Till Halbach. Motivation for error-robust communication. In *Proc. Norwegian Signal Processing Symposium (NORSIG)*, pages 157–161, Trondheim (Norway), October 2001.

Till Halbach and Arne Lie. Norwegian contributions and recent developments in still image standardization. In *Proc. Norwegian Conf. on Image Processing and Pattern Recognition (NOBIM)*, pages 114–117, Trondheim (Norway), June 2000.

Standardization contributions

Till Halbach. Performance comparison: H.26L intra coding vs. JPEG2000. Technical Report D039, ITU-T VCEG | ISO/IEC MPEG (JVT), July 2002.

Till Halbach. Reduced slice headers and bit error resilience. Technical Report C129, ITU-T VCEG | ISO/IEC MPEG (JVT), May 2002.

Till Halbach. Enhanced variable-length coding. Technical Report B034r1, ITU-T VCEG | ISO/IEC MPEG (JVT), January 2002.

Till Halbach. TML-8.4 error resilience performance. Technical Report N67, ITU-T Q.6/SG 16 (VCEG), September 2001.

Till Halbach, Tor A. Ramstad, and Andrew Perkis. Blockwise mixed fixed-length/variable-length coding in JPEG2000. In *Proc. Norwegian Signal Processing Symposium (NORSIG)*, pages 7–12, Asker (Norway), September 1999.

Mathias Wien and Till Halbach. Results of H.26L Core Experiment on adaptive block transforms. Technical Report K15, ITU-T SG16 Q.15, August 2000.

Tor A. Ramstad, Andrew Perkis, Geir Øien, and Till Halbach. Report on Core Experiment: FLC versus VLC. Technical Report N997, ISO/IEC JTC 1/SC 29/WG 1, October 1998.

Andrew Perkis, Tor A. Ramstad, Geir Øien, Helge Coward, and Till Halbach. Fixed length coding by nonuniform scalar quantization in JPEG2000. Technical Report N851, ISO/IEC JTC 1/SC 29/WG 1, June 1998.

Master’s thesis

Till Halbach. Robust still image compression for mobile and wireless communications. Master’s thesis, Norwegian University of Science and Technology, Trondheim (Norway), December 1998.

Other

Till Halbach. Some important international standards and organizations in visual telecommunications, Part III: Video compression standards. *NORSIGNalet*, 1:12–19, April 2003.

Till Halbach. Some important international standards and organizations in visual telecommunications, Part II: Still-image compression standards. *NORSIGNalet*, 3:23–26 and 30, December 2002.

Till Halbach. Some important international standards and organizations in visual telecommunications, Part I: Organizations in international standardization. *NORSIGnalet*, 2:9–13, September 2002.

Andrew Perkis and Till Halbach. 4. generasjons mobilkommunikasjonssystemer. *NORSIGnalet*, 1:3–6, March 2001. (In Norwegian).

Private interests

Sports	Mountaineering, skiing, jogging
Music	Playing the violin
Other	Passionate cooking, especially Mediterranean food

Oslo, May 2008