Curriculum Vitae

Prof. Dr.-Ing Andreas Kolb

Born June 4th 1965 in Radolfzell (Lake Constance)

Computer Graphics Group
University of Siegen
Hölderlinstr. 3
57076 Siegen, Germany

Tel.: ++49 / (0)271 740 2404
Mail: andreas.kolb@uni-siegen.de

(Version: May 3, 2024)

Education

08/92 – 12/95	Dissertation in Computer Graphics, University of Erlangen-Nuremberg Thesis: "Optimization Techniques for Scattered Data Interpolation"
10/86 – 02/92	Study of Mathematics, University of Erlangen-Nuremberg
07/82 – 06/85	Abitur, Technical Gymnasium Konstanz

Academic and Professional History

since 10/03	Full Professor (Chair for Computer Graphics and Multimedia Systems), University of Siegen, Germany
10/98 – 09/03	Professur for Media Informatics, University of Applied Science Wedel, Germany
03/97 – 07/98	Lecturer for Computer Graphics (part-time), University of Applied Science Aalen, Germany
01/96 – 09/98	Software-Engineer and project leader, debis Systemhaus Engineering, Leinfelden–Echterdingen, Germany
08/92 – 12/95	Research associate, University of Erlangen-Nuremberg, Germany
04/92 – 06/92	Software-Engineer, Siemens Medical Solutions, Erlangen, Germany

Teaching

Computer Graphics, Visualization, Computer Vision and Virtual Reality

Current Research Topics

Simulation and data processing on graphics hardware
Processing and fusion of 3D sensor data
Hardware accelerated rendering

Coordination and Committees

2019	Program Committee ACM/Eurographics Symposium on Computer Animation, Lissabon, Los Angeles, USA
2017	Organization Committee: Dagstuhl Seminar on *Hyperspectral, Multispectral, and Multimodal (HMM) Imaging: Acquisition, Algorithms, and Applications*, Schloss Dagstuhl, Germany
2016	Int. Program Committee Eurographics Conference, Lisbon, Portugal
2014	Program Committee: Int. Conf. on 3D Computer Vision (3DV)

2013	Organisation Committee: GCPR Workshop *Imaging New Modalities*, Saarland University
2013	Int. Program Committee Eurographics Conference, Girona, Spain
2012	Organization Committee: Dagstuhl Seminar on *3D Time-of-Flight Technologies*, Schloss Dagstuhl, Germany
2012	Int. Program Committee Eurographics Conference, Cagliari, Sardinia, Italy
2010	Local Chair: Vision, Modeling and Visualization (VMV), Siegen
2010	Int. Program Conference Eurographics Conference, Linkoping, Sweden
2009 – 2018	Speaker of the DFG Research Training Group "Imaging New Modalities" (GRK 1564)
2009	Paper Chair: DAGM Workshop Dynamic 3D Imaging, University of Jena, Germany
since 2009	Programm Committee: Vision, Modeling and Visualization (VMV), various locations in Germany, Austria, Switzerland
2008	Organisation Committee: CVPR Workshop ToF-Camera based Computer Vision
2007	Organisation Committee: DAGM Workshop Dynamic 3D Imaging, University of Heidelberg, Germany
since 2007	Program Committee: GI[1] VR/AR Workshop
2006 – 2010	Speaker of the DFG research package "Dynamic 3D Vision" (PAK 73)
2003	Program Committee: Open SG Forum
2003	Program Committee: Web3D Symposium

Editor and Reviewer

2017	Co-editor of the special issue on *Imaging Depth Sensors—Sensors, Algorithms and Applications*, Sensor Journal, MPDI
2013	Co-editor *A State-of-the-Art Survey on Time-of-Flight and Depth Imaging: Sensors, Algorithms, and Applications*, Springer
2010 – 2020	Editorial Board Member Journal *3D Research*, Springer
2010	Co-editor of the proceedings *Vision, Modeling and Visualization*, Eurographics Ass.
2010	Co-editor of the special issue on *Time of Flight Camera based Computer Vision*, Journal CVIU, Elsevier
2009	Co-editor of the proceedings *Dynamic 3D Imaging*, Springer
2007 – 2015	DFG Ombudsman at University of Siegen
2006 – 2014	Editorial Board Member, Journal *Simulation Practice & Theory (SIMPAT)*, Elsevier
2005	Editor of the special issue on *Programmable Graphics Hardware*, Journal SIMPAT
Projects	Reviewer for EU ERC, DFG[2], DAAD[3], German Academic Scholarship Foundation, SNF[4], MITACS[5]
Publications	Reviewer for: SIGGRAPH, Eurographics, ACM-TOG, CGF, CAD, CAGD, SIMPAT, IEEE-TVCG, IEEE-TSMC, IEEE-TGRS, IEEE-Vis, EG Symp. on Rendering

Memberships

since 2004	Center for Sensor Systeme (ZESS), University of Siegen
since 2002	ACM/SIGGRAPH
since 2001	EUROGRAPHICS Association
since 1998	GI, Section *Graphical Data Processing* (Computer Graphics)

University Service

since 03/24	Vice-Rector for Research, Infrastructure and Collaboration of the University of Siegen

[1] Gesellschaft für Informatik
[2] German Research Foundation
[3] German Academic Exchange Service
[4] Swiss National Science Foundation, Switzerland
[5] Mathematics of Information Technology and Complex Systems, Canada

04/23 –02/24	Spokesperson of the Electrical Engineering and Computer Science department of the Faculty for Science and Technology of the University of Siegen
since 07/22	Deputy Spokesperson of the Center for Sensor Systems (ZESS) of the University of Siegen
since 11/19	DFG Liaison Officer of the University of Siegen
05/15 – 03/17	Co-Chair of the Scientific Advisory Board of the Faculty for Science and Technology of the University of Siegen
02/15 – 02/24	Member in the Faculty Council of the Faculty for Science and Technology of the University of Siegen
2015	Head of the Appointment Committee *Ubiquitous Computing*
since 07/11	Member in the Research Advisory Board of the Faculty for Science and Technology of the University of Siegen
02/11 – 01/15	Vice Dean for Research and Junior Scientists of the Faculty for Science and Technology of the University of Siegen
04/10 – 02/11	Chief Information Officer (CIO) of the University of Siegen
2009 – 2010	Member of the IT-Steering Committee of the University of Siegen
2008 – 2010	Member of the Faculty Council *Electrical Engineering & Computer Science*
2004	Head of the Appointment Committee *Media Information Science*

Personal

married, three children

Project Funding

The third party funds do not include any overhead funds.

[1] A. Kolb. Polymorphic scene representation for enhanced instant scene reconstruction. DFG Sachbeihilfe, grant Ko-2960-20/1, 2023-2026. individual project share ca. 265.000 EUR.

[2] A. Kolb. Forward and differentiable simulation of L2S sensor data. DFG Research Unit 5336 – Learning to Sense (L2S), 2023-2026. individual project share ca. 350.000 EUR.

[3] A. Kolb. Comprehensive adaptive simulation of SPH-based fluids. DFG Sachbeihilfe, grant Ko-2960-15/1,2, 2018-2024. individual project share ca. 392.000 EUR.

[4] A. Kolb, S. Schubert, and V. Braun. Visually integrated clinical cooperation. DFG Sonderforschungsbereich 1187: Media of Cooperation, 2016-2023. individual project share ca. 540.000 EUR.

[5] A. Kolb and M. Pedersen. 3D spectral visualization of cultural heritage. DAAD Program of the project-related exchange of persons; exchange project with the NTNU, Norway, 2016. individual project share ca. 6.000 EUR.

[6] A. Kolb and R. Koch. Dynamic light fields. DFG Sachbeihilfe, grant Ko-2960-13/1, 2014-2020. individual project share ca. 217.000 EUR.

[7] A. Kolb. PMD -modeling, -simulation, -evaluation & algorithms. DFG Sachbeihilfe (Transferprojekt), grant Ko-2960-12/1, 2014-2019. individual project share ca. 260.000 EUR.

[8] A. Kolb. Robust sensor fusion and feature extraction. DFG Graduiertenkolleg 1564-2: Imaging New Modalities, 2014-2018. individual project share ca. 350.000 EUR.

[9] A. Kolb. Multimodal 3D reconstruction and material classification. DFG Graduiertenkolleg 1564-2: Imaging New Modalities, 2014-2018. individual project share ca. 350.000 EUR.

[10] U. Pietsch and A. Kolb. Development and application of a 2D-energy dispersive detectors for synchrotron and fel experiments. BMBF joint project, grant 05K10PSB, 2010-2013. individual project share 178.000 EUR.

[11] P. Haring and A. Kolb. Interactive visualization and exploration of 3D-THz data. BMBF joint project LiveDetect3D, grant 13N11001, 2010-2012. individual project share 232.000 EUR.

[12] A. Kolb and P. Haring. Interactive multifunctional confocal image analysis. DFG Sachbeihilfe, grant Ko-2960-10/1,2, 2010-2018. individual project share ca. 276.000 EUR.

[13] A. Kolb. Contact-free acquistion of vehicle contours for controling car-wash-systems using PMD sensors. AiF-Projekt, grant KF2383701RR9, 2010-2011. individual project share 158.000 EUR.

[14] A. Kolb. Evaluation of the facet-eye principle. BMBF joint project, grant 16SV5267, 2010-2011. individual project share 65.000 EUR.

[15] A. Kolb. Biometrics by multispectral scattering models. DFG Graduiertenkolleg 1564-1: Imaging New Modalities, 2009-2014. individual project share ca. 350.000 EUR.

[16] A. Kolb. Visual analysis of multimodal sensor data. DFG Graduiertenkolleg 1564-1: Imaging New Modalities, 2009-2014. individual project share ca. 350.000 EUR.

[17] A. Kolb. Partikel-based simulation of chemical micro sensors. University of Siegen Graduate School: Integral Hetero-Sensor Architectures for n-dimensionale (bio)chemical Analytics, 2007-2011. individual project share ca. 30.000 EUR.

[18] A. Kolb and K.-D. Kuhnert. Real time acquisition of image based 3D models for object recognition. DFG research package Dynamic 3D Vision (PAK 73), grant Ko-2960-6/1,2, 2006-2011. individual project share ca. 260.000 EUR.

[19] A. Kolb. 2D/3D data processing and fusion for PMD sensors. DFG research package Dynamic 3D Vision (PAK 73), grant Ko-2960-5/1,2, 2006-2011. individual project share ca. 260.000 EUR.

[20] A. Kolb and O. Loffeld. Interactive processing and visualization of sar data. DFG research package Bistatic Exploration (PAK 59), grant Ko-2960-3/1,2, 2006-2011. individual project share ca. 195.000 EUR.

[21] A. Kolb and P. Haring. PMD simulation and modelling of dynamic environments. BMBF joint project Lynkeus, grant 16SV2296-310, 2006-2009. individual project share 217.000 EUR.

Supervisions

Besides some 60 Bachelor, Master and Diploma theses the following PhD theses and habilitations have been supervised or are close to completion:

[1] D. Presnov. *Visually Integrated Clinical Cooperation – Algorithmic Concepts, Implementation and Evaluation.* PhD thesis, University of Siegen, Computer Graphics Group, 13.12.2023. (second reviewer: Prof. Dr. V. Blanz, University of Siegen, Germany).

[2] T.W. Wong. *Optimization-based Enhancement of THz Data and Image.* PhD thesis, University of Siegen, Computer Graphics Group, 05.05.2023. (second reviewer: Prof. Dr. P. Haring Bolívar, University of Siegen, Germany).

[3] M. Rückert. *Real-Time Exploration of Photorealistic Virtual Environments.* PhD thesis, University of Erlangen-Nuremberg, Chair for Visual Computing, 13.04.2023. (second reviewer).

[4] S. Seele. *Attentive Cognitive Agents for Real-time Virtual Environments.* PhD thesis, University of Siegen, Computer Graphics Group, 04.05.2022. (second reviewer: Prof. Dr. R. Herpers, Hochschule Bonn-Rhein-Sieg, Prof. Dr. M. Grzegorzek, University of Lübeck, Germany).

[5] R. Winchenbach. *Spatially Adaptive Smoothed Particle Hydrodynamics.* PhD thesis, University of Siegen, Computer Graphics Group, 16.02.2022. (second reviewer: Prof. Dr. N. Thuerey, Technical University Munich (TUM), Germany).

[6] M. Lambers. Selected topics in interactive computer graphics. Habilitation at the University of Siegen, Computer Graphics Group, 2021.

[7] H. Hochstetter. *Efficient Rendering and Simulation of Fluid Transport and Phase Transitions in SPH-based Fluids.* PhD thesis, University of Siegen, Computer Graphics Group, 22.05.2019. (second reviewer: Prof. Dr. R. Westermann, Technical University Munich (TUM), Germany).

[8] V. N. Xuan. *Super-resolution Compressed Sensing for Resolving Time-of-Flight Multipath Interferences.* PhD thesis, University of Siegen, Center for Sensor Systems, 30.08.2018. (second reviewer).

[9] S. Hartmann. *Example-Based Urban Modeling.* PhD thesis, University of Bonn, Institute for Computer Science II, 20.07.2018. (second reviewer).

[10] D. Lefloch. *Real-Time Processing of Range Data Focusing on Environment Reconstruction.* PhD thesis, University of Siegen, Computer Graphics Group, 26.01.2018. (second reviewer: Prof. Dr. T. Weyrich, University College London, UK).

[11] M. Pätzold. *Graphical Models and Simulation for THz-Imaging.* PhD thesis, University of Siegen, Computer Graphics Group, 24.01.2018. (second reviewer: Prof. Dr. P. Haring Bolívar, University of Siegen, Germany).

[12] T. Hoegg. *Efficient Range and Image Data Processing – Algorithms and Software Paradigms.* PhD thesis, University of Siegen, Computer Graphics Group, 18.10.2017. (second reviewer: Prof. Dr. M. Stamminger, University of Erlangen, Germany).

[13] M. Heredia Conde. *Compressive Sensing for the Photonic Mixer Device.* PhD thesis, University of Siegen, Center for Sensor Systems, 14.11.2016. (second reviewer).

[14] H. Steiner. *Active Multispectral SWIR Imaging for Reliable Skin Detection and Face Verification.* PhD thesis, University of Siegen, Computer Graphics Group, 2.11.2016. (second reviewer: Prof. Dr. V. Blanz, University of Siegen, Germany).

[15] A. Grote. *Integrale Betrachtung zur systematischen Definition von 3D Bildgebungssystemen in der Produktionstechnik*. PhD thesis, University of Siegen, Institute for High Frequency and Quantum Electronics, 4.10.2016. (second reviewer).

[16] M. Keller. *Real-time Simulation of Time-of-Flight Sensors and Accumulation of Range*. PhD thesis, University of Siegen, Computer Graphics Group, 13.11.2015. (second reviewer: Prof. Dr. R. Koch, University of Kiel, Germany).

[17] J. Orthmann. *Efficient SPH-based Simulation and Rendering of Fluid Transport Dynamics*. PhD thesis, University of Siegen, Computer Graphics Group, 14.11.2014. (second reviewer: Prof. Dr. M. Teschner, University of Freiburg, Germany).

[18] D. Jung. *Depth Image-Based Rendering for Full Parallax Displays*. PhD thesis, University of Kiel, Institute of Computer Science, 7.11.2014. (second reviewer).

[19] D. Zukic. *An Efficient Inflation Method for Segmentation of Medical 3D Images*. PhD thesis, University of Siegen, Computer Graphics Group, 8.9.2014. (second reviewer: Prof. Dr. G. Scheuermann, University of Leipzig, Germany).

[20] D. Fiedler. *Beiträge zur Analyse, Modellierung und Kalibrierung von Kameras und 3D-Tiefensensoren*. PhD thesis, Technische Univesität Dortmund, Computer Graphics Group, 18.03.2014. (second reviewer).

[21] B. Langmann. *Wide Area 2D/3D Imaging: Development, Analysis and Applications*. PhD thesis, University of Siegen, Center for Sensor Systems, 30.10.2013. (second reviewer).

[22] B. Labitzke. *Visualization and Analysis of Multispectral Image Data*. PhD thesis, University of Siegen, Computer Graphics Group, 28.10.2013. (second reviewer: Prof. Dr. V. Blanz, University of Siegen, Germany).

[23] O. Schwaneberg. *Concept, System Design, Evaluation and Safety Requirements for a Multispectral Sensor*. PhD thesis, University of Siegen, Computer Graphics Group, 26.09.2013. (second reviewer: Prof. Dr. P. Haring-Bolívar, University of Siegen, Germany).

[24] B. Drayton. *Algorithm and design improvements for indirect time of flight range imaging cameras*. PhD thesis, Victoria University of Wellington, NZ, 12.07.2013. (second reviewer).

[25] U. Hahne. *Real-time depth imaging*. PhD thesis, TU Berlin, Computer Graphics Group, 03.05.2012. (second reviewer).

[26] R. Fraedrich. *Interactive Visualization Techniques for Large-Scale Particle Simulations*. PhD thesis, TU München, Computer Graphics and Visualization Group, 10.04.2012. (second reviewer).

[27] M. Droste. *Customizable Visualization in the Context of Metabolic Networks*. PhD thesis, Forschungszentrum Jülich, Systems Biotechnology Group, 02.12.2011. (second reviewer).

[28] M. Lambers. *Interaktive Visualisierung und Exploration von SAR-Daten*. PhD thesis, University of Siegen, Computer Graphics Group, 01.07.2011. (second reviewer: Dr. habil. Karol Myszkowski, MPI Saarbrücken, Germany).

[29] I. Schiller. *Dynamic 3D Scene Analysis and Modeling with a Time-of-Flight Camera*. PhD thesis, University of Kiel, Institute of Computer Science, 17.05.2011. (second reviewer).

[30] I. Chiosa. *Efficient and High Quality Clustering*. PhD thesis, University of Siegen, Computer Graphics Group, 25.10.2010. (second reviewer: Prof. Dr. Mario Botsch, University of Bielefeld, Germany).

[31] M. Lindner. *Calibration and Realtime Processing of Time-of-Flight Range Data.* PhD thesis, University of Siegen, Computer Graphics Group, 15.10.2010. (second reviewer: Prof. Dr. Reinhard Koch, University of Kiel, Germany).

[32] M. Böhme. *Tracking Gaze and Human Activity.* PhD thesis, University of Lübeck, Inst. for Neuro- and Bioinformatics, 2010. (tertiary reviewer).

[33] M. Winter. *Image-based incremental reconstruction, rendering and augmented visualization of Surfaces for endoscopic surgery.* PhD thesis, University of Erlangen, Department of Computer Science, 2010. (second reviewer).

[34] C. Rezk-Salama. Real-time volume visualization. Habilitation at the University of Siegen, Computer Graphics Group, 2009.

[35] N. Cuntz. *Real-time particle systems.* PhD thesis, University of Siegen, Computer Graphics Group, 2009. (second reviewer: Prof. Dr. Daniel Weiskopf, University of Stuttgart, Germany).

[36] S. Todt. *Real-Time Rendering and Akquisition of spherical light fields.* PhD thesis, University of Siegen, Computer Graphics Group, 2009. (second reviewer: Prof. Dr. Günther Greiner, University of Erlangen, Germany).

[37] J.-F. Evers-Senne. *Plenoptic Modelling and Rendering of Complex Rigid Scenes.* PhD thesis, University of Kiel, Institute of Computer Science, 2008. (second reviewer).

[38] R. Reichard. *Ereignisorientierte Simulation einer Hochenergie-Kugelmühle.* PhD thesis, University of Siegen, Inst. for Simulation Technology, 2005. (second reviewer).

[39] M. Groß. *Entwicklung eines Softwaresystems zur universellen Planung chirurgischer Eingriffe in 2D- und 3D Modalitäten.* PhD thesis, University of Siegen, Inst. for Automatic Control Engineering, 2004. (second reviewer).

Publications

An overview of my pubilcations can be found on Google Scholar, Scopus and ResearchID.

Peer Reviewed Journal Publications

[1] R. Winchenbach, M. Moeller, and A. Kolb. Lipschitz-agnostic, efficient and accurate rendering of implicit surfaces. *J. The Visual Computer*, 2023. DOI: 10.1007/s00371-023-03216-y.

[2] R. Akhunov and A. Kolb. Decoupled boundary handling in sph. In *J. The Visual Computer*, 2023. DOI: 10.1007/s00371-023-03212-2.

[3] D. Presnov, M. Berels, and A. Kolb. Pacemod: Parametric contour-based modifications for glyph generation. *J. The Visual Computer*, 2023. DIO: 10.1007/s00371-023-03040-4.

[4] M. Kluge, T. Weyrich, and A. Kolb. Progressive refinement imaging with depth-assisted disparity correction. *Computers & Graphics*, 115:446–460, 2023.

[5] H. Sommerhoff and A. Kolb. Hashed, binned a-buffer for real-time outlier removal and rendering of noisy point clouds. *J. The Visual Computer*, 2023. DOI: 10.1007/s00371-023-02888-w.

[6] D. Presnov, J. Kurz, J. Willkomm, J. Dillmann, D. Remmel, R. Zilke, V. Braun, C. Schubert, and A. Kolb. On-body/in-place visualization of patient data for cooperative tasks. *Health Informatics Journal*, 29(2), 2023. DIO: 10.1177/14604582231171878.

[7] R. Akhunov, R. Winchenbach, and A. Kolb. Evaluation of particle-based sph boundary handling approaches in computer animation. *J Computer Animation and Virtual Worlds*, 34(6), 2022. DOI: 10.1002/cav.2138.

[8] D. Presnov and A. Kolb. Perception and quantization model for periodic contour modifications. *Journal of Imaging*, 8(11), 2022. DOI: 10.3390/jimaging8110311.

[9] H. Sommerhoff and A. Kolb. A generic framework for depth reconstruction enhancement. *Journal of Imaging*, 8(5):138, 2022.

[10] R. Winchenbach and A. Kolb. Optimized refinement for spatially adaptive SPH. *ACM Trans. Graph.*, 40(1):1–15, 2021.

[11] P. Chandramouli, K. V. Gandikota, A. Görlitz, A. Kolb, and M. Moeller. Generative models for generic light field reconstruction. In *IEEE Trans. Pattern Anal. and Mach. Intell.*, 2020. DOI: 10.1109/TPAMI.2020.3039841.

[12] R. Winchenbach, R. Akhunov, and A. Kolb. Semi-analytic boundary handling below particle resolution for smoothed particle hydrodynamics. *ACM Trans. Graph. (Proc. SIGGRAPH ASIA)*, 39(6):1–17, 2020.

[13] R. Winchenbach and A. Kolb. Multi level memory structures for simulating and rendering smoothed particle hydrodynamics. *J. Computer Graphics Forum*, 2020. DOI: 10.1111/cgf.14090.

[14] C. Schubert and A. Kolb. Designing technology, developing theory. towards a symmetrical approach. *Science, Technology & Human Values*, 46(3):528–554, 2020. DOI: 10.1177/0162243920941581.

[15] M. Kluge, T. Weyrich, and A. Kolb. Progressive refinement imaging. *J. Computer Graphics Forum*, 39(1):360–374, 2020.

[16] H. Steiner, H. Sommerhoff, D. Bulczak, M. Lambers, N. Jung, and A. Kolb. Fast motion estimation for field sequential imaging: Survey and benchmark. *Image and Vision Computing*, 89:170–182, 2019.

[17] T. M. Wong, M. Kahl, P. Haring Bolívar, and A. Kolb. Computational image enhancement for frequency modulated continuous wave (FMCW) THz image. *Journal of Infrared, Millimeter, and Terahertz Waves*, 40(7):775–800, 2019. DIO: 10.1007/s10762-019-00609-w.

[18] T. Shirley, D. Presnov, and A. Kolb. A lightweight approach to 3D measurement of chronic wounds. *Journal of the WSCG*, 27(1):67–74, 2019.

[19] C. Pomrehn, D. Klein, A. Kolb, R. Herpers, and P. Kaul. Supervised classification of monomodal and multimodal hyperspectral data in vibrational microspectroscopy: A comprehensive comparison. *Chemometrics and Intelligent Laboratory Systems*, 184:112–122, 2019.

[20] H. Sarbolandi, M. Plack, and A. Kolb. Pulse based time-of-flight range sensing. *Sensors*, 18(6):1679, 2018.

[21] M. Zollhöfer, P. Stotko, A. Görlitz, C. Theobalt, M. Nießner, R. Klein, and A. Kolb. State of the art on 3D reconstruction with RGB-D cameras. *J. Computer Graphics Forum(Eurographics STAR)*, 37(2):625–652, 2018. DOI: 10.1111/cgf.13386.

[22] D. Presnov, M. Lambers, and A. Kolb. Robust range camera pose estimation for mobile online scene reconstruction. *IEEE Sensors J.*, 18(7):2903 – 2915, 2018. DOI 10.1109/JSEN.2018.2801878.

[23] D. Bulczak, M. Lambers, and A. Kolb. Quantified, interactive simulation of AMCW ToF camera including multipath effects. *Sensors*, 18(1):13, 2018.

[24] T. Geisler and A. Kolb. Pattern recognition of rough surfaces by using goniometric scattered light. *Metrology and Measurement Systems*, 25(1):33–46, 2018.

[25] R. Winchenbach, H. Hochstetter, and A. Kolb. Infinite continuous adaptivity for incompressible SPH. In *ACM Trans. Graph. (Proc. SIGGRAPH)*, volume 36, pages 102:1–102:10, 2017.

[26] D. Lefloch, M. Kluge, H. Sarbolandi, T. Weyrich, and A. Kolb. Comprehensive use of curvature for robust and accurate online surface reconstruction. *IEEE Trans. Pattern Anal. and Mach. Intell.*, 39(12):2349–2365, 2017.

[27] C. Schikora, M. Plack, R. Bornemann, P. Haring Bolívar, and A. Kolb. Visual analysis of confocal raman spectroscopy data using cascaded transfer function design. In *Computer Graphics Forum (Proc. EuroVis)*, volume 36, pages 239–249, 2017.

[28] F. Alghabi, S. Send, U. Schipper, A. Abboud, U. Pietsch, and A. Kolb. Fast GPU-based absolute intensity determination for energy-dispersive X-ray Laue diffraction. *J. of Instrumentation*, 11(01):T01001, 2016. DOI:10.1088/1748-0221/9/11/T11003.

[29] H. Steiner, S. Sporrer, A. Kolb, and N. Jung. Design of an active multispectral SWIR camera system for skin detection and face verification. *Journal of Sensors, Special Issue zu Multispectral, Hyperspectral, and Polarimetric Imaging Technology*, 501, 2016. Article ID: 9682453; DOI: 10.1155/2016/9682453.

[30] H. Sarbolandi, D. Lefloch, and A. Kolb. Kinect range sensing: Structured-light versus time-of-flight kinect. *J. Computer Vision and Image Understanding*, 139:1–20, 2015. DOI:10.1016/j.cviu.2015.05.006.

[31] M. Lambers, S. Hoberg, and A. Kolb. Simulation of time-of-flight sensors for evaluation of chip layout variants. *IEEE Sensors J.*, 15(7):4019–4026, 2015. DOI: 10.1109/JSEN.2015.2409816.

[32] F. Alghabi, S. Send, U. Schipper, A. Abboud, N. Pashniak, U. Pietsch, and A. Kolb. Fast GPU-based spot extraction for energy-dispersive X-ray laue diffraction. *J. of Instrumentation*, 11(01):T11003, 2014.

[33] F. Heide, L. Xiao, A. Kolb, M. Hullin, and W. Heidrich. Imaging in scattering media using correlation image sensors and sparse convolutional coding. *Optics Express*, 22(21):26338–26350, 2014.

[34] D. Zukić, A. Vlasák, J. Egger, D. Hořínek, C. Nimsky, and A. Kolb. Robust detection and segmentation for diagnosis of vertebral diseases using routine MR images. *J. Computer Graphics Forum(Invited Paper)*, 33(6):190–204, 2014.

[35] M. Pätzold, M. Kahl, T. Klinkert, A. Keil, T. Löffler, P. Haring Bolívar, and A. Kolb. Framework for hybrid synthetic aperture THz systems including simulation of thz-scattering. *IEEE Trans. Terahertz Science & Technology*, 3(5):625–634, 2013.

[36] J. Bader, M. Pätzold, and A. Kolb. Constraint up-scaling for direct and global image components. *Journal of the WSCG*, 21(1):69–78, 2013.

[37] T. Hoegg, D. Lefloch, and A. Kolb. Time-of-flight camera based 3d point cloud reconstruction of a car. *J. Computers in Industry*, 64(9):1099–1114, 2013.

[38] L. Maier-Hein, P. Mountney, A. Bartoli, H. Elhawary, D. Elson, A. Groch, A. Kolb, M. Rodrigues, J. Sorger, S. Speidel, and D. Stoyanov. Optical techniques for 3D surface reconstruction in computer-assisted laparoscopic surgery. *Medical Image Analysis*, 17(8):974–996, 2013.

[39] F. Heide, M. Rouf, M. Hullin, B. Labitzke, W. Heidrich, and A. Kolb. High-quality computational imaging through simple lenses. *ACM Trans. Graph. (presented at SIGGRAPH 2013)*, 32(5):149:1–149:14, 2013.

[40] J. Egger, D. Zukić, B. Freisleben, A Kolb, and C. Nimsky. Segmentation of pituitary adenoma: A graph-based method vs. a balloon inflation method. *J. Computer Methods and Programs in Biomedicine*, 110(3):268–278, 2013.

[41] O. Schwaneberg, U. Köckemann, H. Steiner, S. Sporrer, A. Kolb, and N. Jung. Material classification through distance aware multispectral data fusion. *Measurement Science and Technology*, 24(4):045001, 2013.

[42] J. Orthmann and A. Kolb. Temporal blending for adaptive SPH. *J. Computer Graphics Forum (presented at EUROGRAPHCS 2013)*, 31(8):2436–2449, 2012.

[43] B. Labitzke, S. Bayraktar, and A. Kolb. Generic visual analysis for multi-and hyperspectral image data. *J. Data Mining and Knowledge Discovery - Special issue on Intelligent Interactive Data Visualization*, pages 117–145, 2012.

[44] I. Chiosa and A. Kolb. GPU-based multilevel clustering. *IEEE Trans. on Visualization and Computer Graphics*, 17(2):132–145, 2011.

[45] M. Lambers and A. Kolb. Dynamic terrain rendering. *J. 3D Research*, 1(4):1–8, 2010.

[46] M. Lindner, I. Schiller, A. Kolb, and R. Koch. Time-of-flight sensor calibration for accurate range sensing. *J. Computer Vision and Image Understanding*, 114(12):1318–1328, 2010.

[47] A. Kolb, E. Barth, R. Koch, and R. Larsen. Time-of-flight cameras in computer graphics. *J. Computer Graphics Forum*, 29(1):141–159, 2010.

[48] N. Cuntz, A. Pritzkau, and A. Kolb. Time-adaptive lines for the interactive visualization of unsteady flow data sets. *J. Computer Graphics Forum*, 28(8):2165–2175, 2009.

[49] J. Orthmann, C. Rezk-Salama, and A. Kolb. GPU-based responsive grass. In *Journal of WSCG*, volume 17, pages 65–72, 2009.

[50] M. Keller and A. Kolb. Real-time simulation of time-of-flight sensors. *J. Simulation Practice and Theory*, 17:967–978, 2009.

[51] S. Todt, M. Langer, C. Rezk-Salama, A. Kolb, and K. Kuhnert. Spherical light field rendering in application for analysis by synthesis. *Int. J. on Intell. Systems and Techn. and App., Special Issue on Dynamic 3D Imaging*, 5(3/4):304 – 314, 2008.

[52] M. Lindner, M. Lambers, and A. Kolb. Sub-pixel data fusion and edge-enhanced distance refinement for 2D/3D images. *Int. J. on Intell. Systems and Techn. and App., Special Issue on Dynamic 3D Imaging*, 5(3/4):344 – 354, 2008.

[53] S. Todt, C. Rezk-Salama, A. Kolb, and K.-D. Kuhnert. GPU-based spherical light field rendering with per-fragment depth correction. *J. Computer Graphics Forum*, 27(8):2081–2095, 2008.

[54] N. Cuntz, D. Weiskopf, R. Strzodka, and A. Kolb. Particle level set advection for the interactive visualization of unsteady 3D flow. *J. Computer Graphics Forum (Proc. EuroVis)*, 27(3):719–726, 2008.

[55] M. Lambers, H. Nies, and A. Kolb. Interactive dynamic range reduction for SAR images. *Geoscience and Remote Sensing Letters (GRSL)*, 5(3):507–511, 2008.

[56] C. Rezk-Salama, S. Todt, and A. Kolb. Raycasting of light field galleries from volumetric data. *J. Computer Graphics Forum (Proc. EuroVis)*, 27(3):839–846, 2008.

[57] C. Rezk-Salama and A. Kolb. Opacity peeling for direct volume rendering. In *J. Computer Graphics Forum (Proc. Eurographics)*, volume 25, pages 597–606, 2006.

[58] R. Strzodka, M. Doggett, and A. Kolb. Scientific computation for simulations on programmable graphics hardware. *J. Simulation Practice & Theory*, 13(8):667–680, 2005.

[59] L. Latta and A. Kolb. Homomorphic factorization of BRDF-based lighting computation. *ACM Trans. Graph. (Proc. SIGGRAPH)*, 21(3):509–516, 2002.

[60] G. Greiner, A. Kolb, and A. Riepl. Scattered data interpolation using data-dependent optimization techniques. *Graphical Models*, 64:1–18, 2002.

[61] A. Kolb, H. Pottmann, and H.-P. Seidel. Fair surface reconstruction using quadratic functionals. In *J. Computer Graphics Forum (Proc. Eurographics) '95*, volume 14, pages 469–479. Eurographics, Blackwell Publishers, 1995.

[62] G. Greiner, A. Kolb, R. Pfeifle, H.-P. Seidel, M. Encarnação, and R. Klein. A platform for visualizing curves and surfaces. *Computer Aided Design*, 27:7:559–566, 1995.

[63] A. Kolb and H.-P. Seidel. Interpolating scattered data with C^2 surfaces. *Computer Aided Design*, 27:4:277–282, 1995.

Edited Books

[1] G. R. Arce, R. Bamler, J. Y. Hardeberg, A. Kolb, and S. Beigpour. HMM imaging: Acquisition, algorithms, and applications (Dagstuhl Seminar 17411). *Dagstuhl Reports*, 7(10):14–41, 2017.

[2] M. Grzegorzek, C. Theobalt, R. Koch, and A. Kolb, editors. *Time-of-Flight and Depth Imaging. Sensors, Algorithms, and Applications*, volume 8200 of *LNCS*. Springer, 2013.

[3] R. Larsen, E. Barth, and A. Kolb, editors. *Computer Vision and Image Understanding, Special issue on Time-of-Flight Camera Based Computer Vision*, volume 114. Elsevier, 2010.

[4] R. Koch, A. Kolb, and C. Rezk-Salama, editors. *Proc. Vision, Modeling & Visualization (VMV)*. Eurographics Association, 2010.

[5] A. Kolb and R. Koch, editors. *Proc. DAGM Workshop Dynamic 3D Imaging*, volume 5742 of *LNCS*. Springer, 2009.

[6] K.-D. Kuhnert and A. Kolb, editors. *Int. J. Intelligent Systems Technologies & Applications, Special Issue: Int. Workshop Dynamic 3D Imaging*, volume 5. Inderscience, 2008.

[7] A. Kolb, editor. *Simulation Modelling Practice and Theory (SIMPAT), special issue on programmable graphics hardware*, volume 13. Elsevier, 2005.

Book Chapters

---

[1] T. Wong, H. Bauermeister, M. Kahl, P. Haring Bolívar, M. Möller, and A. Kolb. *ATHENA Annual Research Book (ARB)*, chapter Deep Neural Network as an Optimizer for FMCW THz Image Deblurring, pages 13–21. ATHENA, 2022. DOI: 10.18690/um.3.2022.2.

[2] A. Kolb, J. Zhu, and R. Yang. *Digital Representations of the Real World: How to Capture, Model, and Render Visual Reality*, chapter Sensor fusion, pages 133–150. AK Peters / CRC Press, 2015.

[3] A. Kolb and F. Pece. *Digital Representations of the Real World: How to Capture, Model, and Render Visual Reality*, chapter Range Imaging, pages 51–64. AK Peters / CRC Press, 2015.

[4] D. Lefloch, R. Nair, F. Lenzen, H. Schäfer, L. Streeter, M. Cree, R. Koch, and A. Kolb. *Time-of-Flight and Depth Imaging*, volume 8200 of *LNCS*, chapter Technical Foundation and Calibration Methods for Time-of-Flight Cameras, pages 3–24. Springer, 2013.

[5] R. Nair, S. Meister, M. Lambers, M. Balda, H. Hoffmann, A. Kolb, D. Kondermann, and B. Jähne. *Time-of-Flight and Depth Imaging*, volume 8200 of *LNCS*, chapter Ground Truth for Evaluating Time of Flight Imaging, pages 52–74. Springer, 2013.

[6] J. Bader, B. Labitzke, M. Grzegorzek, and A. Kolb. *BIOMETRICS*, chapter Multispectral Pattern Recognition Techniques for Biometrics, pages 87–116. Centrum Inżynierii Biomedycznej Gliwice, 2011.

[7] D. Zukić, C. Rezk-Salama, and A. Kolb. *Studies in Computational Intelligence*, volume 240, chapter Classifying Volume Datasets Based on Intensities and Geometric Features, pages 63–85. Springer, 2009.

[8] S. Todt, C. Rezk-Salama, and A. Kolb. *Virtuelle Welten als Basistechnologie für Kunst und Kultur*, chapter Virtuelle Rekonstruktion und Interaktive Exploration der Schlossanlage Dillenburg, pages 119–138. transscript Verlag, 2009.

[9] A. Kolb, R. Leschke, and T. Reinhard. *Navigationen – Special Issue: Interaktionen*, chapter Interaktion – Ein Begriff zwischen den Wissenschaften, pages 81–102. Transkript Verlag, 2008.

[10] K. Kuhnert, M. Langer, M. Stommel, and A. Kolb. *Vision Systems*, chapter Dynamic 3D Vision, pages 311–334. Advanced Robotic Systems, Vienna, 2007.

[11] A. Kolb, C. Rezk-Salama, and J. Venus. *Navigationen – Special Issue: Display II Digital*, chapter Displaying Interplay - Entwicklungstrends der Mensch-Maschine Interaktion, pages 71–85. Transkript Verlag, 2007.

[12] P. Slusallek, R. Klein, A. Kolb, and G. Greiner. An object-oriented approach for curves and surfaces. In P.Wisskirchen, editor, *Object-oriented and fixed programming paradigms*, pages 33–44. Springer, 1996.

[13] A. Kolb, H. Pottmann, and H.-P. Seidel. Surface reconstruction based upon minimum norm networks. In M. Dæhlen, T. Lyche, and L.L. Schumaker, editors, *Math. Methods for Curves and Surfaces*, pages 293–304, Ulvik, Norway, 1995. Vanderbuilt University Press.

[14] Ph. Slusallek, R. Klein, A. Kolb, and G. Greiner. An object–oriented framework for curves and surfaces with applications. In P.J. Laurent, A. LeMéhauté, and L.L. Schumaker, editors, *Curves and Surfaces in Geometric Design*, pages 457–466, Boston, 1994. AK Peters.

Peer Reviewed Conference Publications

[1] J. P. Schneider, M. Fatima, J. Lukasik, A. Kolb, M. Keuper, and M. Möller. Implicit representations for constrained image segmentation. In *Proc. Int. Conf. on Machine Learning (ICML)*, 2024. accepted for publication.

[2] J.-Ph. Schneider, M. Fatima, J. Lukasik, A. Kolb, M. Keuper, and M. Möller. Implicit representations for image segmentation. In *NeurIPS, Workshop on Unifying Representations in Neural Models*, 2023. accepted for publication, Oct. 2023.

[3] A. Görlitz, M. Möller, and A. Kolb. Coherent enhancement of depth images and normal maps using second-order geometric models on weighted finite graphs. In *Proc. Conf. 3D Vision (3DV)*, 2023. accepted for publication, Oct. 2023.

[4] A. Görlitz, M. Möller, and A. Kolb. FL0C: Fast l0 cut pursuit for estimation of piecewise constant functions. In *Proc. IEEE Int. Conf. Image Processing (ICIP)*, pages 3677–3681, 2022.

[5] T.M. Wong, H. Bauermeister, M. Kahl, P. Haring-Bolivar, A. Kolb, and M. Moeller. Deep optimization prior for thz model parameter estimation. In *Proc. IEEE/CVF Winter Conf. Applications of Computer Vision (WACV)*, pages 3811–3820, 2022.

[6] C. Pomrehn, A. Kolb, and R. Herpers. Global gradient-based representation of hyperspectral images for registration refinement in multimodal microspectroscopy. In *Proc. IEEE Workshop on Hyperspectral Imaging and Signal Processing (WHISPERS)*, 2021. DOI: 10.1109/WHISPERS52202.2021.9483994.

[7] H. Sommerhoff, A. Kolb, and M. Moeller. Energy dissipation with plug-and-play priors. In *Proc. Conf. Neural Information Processing Systems (NeurIPS), Workshop on Solving Inverse Problems with Deep Networks*, 2019.

[8] R. Winchenbach and A. Kolb. Multi-level-memory structures for adaptive SPH simulations. In *Proc. Vision, Modeling and Visualization*, 2019. DOI: 10.2312/vmv.20191323; Honorable Mentioned.

[9] T.M. Wong, M. Kahl, P. Haring-Bolivar, A. Kolb, and M. Moeller. Training auto-encoder-based optimizers for terahertz image reconstruction. In *Proc. German Conf. Pattern Recognition (GCPR) (oral presentation)*, LNCS, pages 93–106. Springer, 2019.

[10] C. Pomrehn, D. Klein, A. Kolb, P. Kaul, and R. Herpers. Multiresolution analysis pansharpening for the fusion of raman and conventional brightfield microscopy images. In *Proc. IEEE Workshop on Hyperspectral Imaging and Signal Processing (WHISPERS)*, 2019. DOI: 10.1109/WHISPERS.2019.8921202.

[11] A. Görlitz, J. Geiping, and A. Kolb. Piecewise rigid scene flow with implicit motion segmentation. In *Proc. Int. Conf. Intell. Robots and Systems (IROS)*, pages 1758–1765, 2019.

[12] P. Chandramouli, S. Burri, C. Bruschini, E. Charbon, and A. Kolb. A bit too much? high speed imaging from sparse photon counts. In *Proc. IEEE Int. Conf. Computational Photography (ICCP)*, 2019. DOI: 10.1109/ICCPHOT.2019.8747325.

[13] D. Stock, A.K. Wigger, T.M. Wong, A. Kolb, and P. Haring Bolívar. Advanced signal processing techniques for THz imaging and sensing enhancement in material quality control applications. In *Proc. SPIE Photonics West OPTO*. SPIE, 2019. DOI: 10.1117/12.2515642.

[14] G. Franchi, A. Kolb, and A. Yao. Supervised deep kriging for single-image super-resolution. In *Proc. German Conf. Pattern Recognition (GCPR) (oral presentation)*, LNCS, pages 638–649, 2018.

[15] D. Bulczak and A. Kolb. Efficient subsurface scattering simulation for time-of-flight sensors. In *Proc. Vision, Modeling and Visualization*, 2018. DOI: 10.2312/vmv.20181259.

[16] C. Pomrehn, D. Klein, A. Kolb, P. Kaul, and R. Herpers. Application of pansharpening algorithms for the fusion of raman and conventional brightfield microscopy images. In *Proc. IEEE Workshop on Hyperspectral Imaging and Signal Processing (WHISPERS)*, 2018. DOI: 10.1109/WHISPERS.2018.8747082.

[17] M. Lambers, H. Sommerhoff, and A. Kolb. Realistic lens distortion rendering. In *Proc. Conf. on Computer Graphics, Visualization and Computer Vision (WSCG)(Short Paper; Poster)*, page P83, 2018.

[18] G. Franchi, M.L. Ha, V. Blanz, M. Möller, and A. Kolb. Segmentation and shape extraction from convolutional neural networks. In *Proc. IEEE Int. Winter Conf. Applications of Computer Vision (WACV)*, pages 1509–1518, 2018.

[19] H. Hochstetter and A. Kolb. Evaporation and condensation of SPH-based fluids. In *Proc. ACM SIGGRAPH/Eurographics Symp. Computer Animation (SCA)*, pages 3:1–3:9, 2017.

[20] S. Beigpour, Mai Lan Ha, S. Kunz, V. Blanz, and A. Kolb. Multi-view multi-illuminant intrinsic dataset. In *Proc. British Machine Vision Conf. (BMVC)*, pages 10.1–10.13, 2016. DOI: 10.5244/C.30.10.

[21] H. Hochstetter, J. Orthmann, and A. Kolb. Adaptive sampling for on-the-fly ray casting of particle-based fluids. In *Proc. ACM/Eurographics High Performace Graphics*, pages 129–138, 2016.

[22] R. Winchenbach, H. Hochstetter, and A. Kolb. Constrained neighbor lists for SPH-based fluid simulations. In *Proc. ACM SIGGRAPH/Eurographics Symp. Computer Animation (SCA)*, pages 49–56, 2016.

[23] S. Scheckel and A. Kolb. Min-max mipmaps for efficient 2d occlusion culling. In *Proc. Conf. on Computer Graphics, Visualization and Computer Vision (WSCG)*, pages 13–16, 2016.

[24] H. Steiner, A. Kolb, and N. Jung. Reliable face anti-spoofing using multispectral SWIR imaging. In *Proc. Int. Conf. Biometrics (ICB)*, pages 1–8, 2016.

[25] Th. Högg, Ch. Köhler, and A. Kolb. Abstracting data and image processing systems using a component-based domain specific language. In *Proc. Int. Conf. Model-Driven Engineering and Software Development (MODELSWARD)*, pages 292–300, 2016. DOI: 10.5220/0005743502920300.

[26] Th. Högg, G. Fiedler, Ch. Köhler, and A. Kolb. Flow driven GPGPU programming combining textual and graphical programming. In *Proc. Int. Workshop Programming Models & Applications for Multicores and Manycores*, pages 88–97, 2016.

[27] Th. Högg, Ch. Balz, and A. Kolb. Online improvement of time-of-flight camera accuracy by automatic integration time adaption. In *Proc. IEEE Int. Symp. Signal Processing and Information Technology (ISSPIT)*, pages 613–618, 2015.

[28] S. Beigpour, S. Kunz, and A. Kolb. A comprehensive multi-illuminant dataset for benchmarking of intrinsic image algorithms. In *Proc. Int. Conf. Computer Vision (ICCV)*, pages 172–180, 2015.

[29] T. Hoegg, Ch. Köhler, and A. Kolb. Component based data and image processing systems - a conceptual and practical approach. In *Proc. IEEE Int. Conf. Software Engineering and Service Science (ICSESS)*, pages 66–69, 2015.

[30] M. Pätzold and A. Kolb. Grid-free out-of-core voxelization to sparse voxel octrees on GPU. In *Proc. ACM/Eurographics High Performace Graphics*, pages 95–103. ACM, 2015.

[31] D. Lefloch, T. Weyrich, and A. Kolb. Anisotropic point-based fusion. In *Proc. Int. Conf. Information Fusion*, pages 2121–2128, 2015.

[32] Hochstetter. H., A. Wurm, and A. Kolb. Vector field visualization of advective-diffusive flows. In *Computer Graphics Forum (Proc. EuroVis)*, volume 34, 2015. DOI: 10.1111/cgf.12660.

[33] L. Xiao, F. Heide, M. O'Toole, A. Kolb, M. Hullin, K. Kutulakos, and W. Heidrich. Defocus deblurring and superresolution for time-of-flight depth cameras. In *Proc. IEEE Conf. on Computer Vision and Pattern Recognition*, pages 2376–2384. IEEE, 2015.

[34] F. Alghabi, U. Schipper, and A. Kolb. A scalable software framework for stateful stream data processing on multi-gpu systems and applications. In *Proc. Symp. GPU Programming and Applications*, LNCS, pages 99–118. Springer, 2015.

[35] M. Ihmsen, J. Orthmann, B. Solenthaler, A. Kolb, and M. Teschner. SPH fluids in computer graphics. In *Proc. Eurographics (State-of-the-Art Report)*, pages 21–42, 2014.

[36] B. Labitzke, F. Urrigshardt, and A. Kolb. Expressive spectral error visualization for enhanced spectral unmixing. In *Proc. Vision, Modeling and Visualization*, pages 9–16, 2013.

[37] T. Högg, D. Lefloch, and A. Kolb. Real-time motion artifact compensation for PMD-ToF images. In *Proc. Workshop Imaging New Modalities, German Conference of Pattern Recognition (GCPR)*, volume 8200 of *LNCS*, pages 273–288. Springer, 2013.

[38] S. Bayraktar, B. Labitzke, R. Bornemann, P. Haring Bolivar, and A. Kolb. Efficient, robust, and scale-invariant decomposition of raman spectra. In *Proc. IEEE Int. Conf. Signal and Image Processing Applications (ICSIPA)*, pages 317–321, 2013.

[39] B. Labitzke, M. Paltian, and A. Kolb. Radviz-based visual analysis of multispectral images. In *Proc. Colour and Visual Computing Symposium (CVCS)*, pages 1–6, 2013. DOI: 10.1109/CVCS.2013.6626270.

[40] J. Orthmann, J. Bader, H. Hochstetter, and A. Kolb. Consistent surface model for SPH-based fluid transport. *Proc. ACM SIGGRAPH/Eurographics Symp. Computer Animation (SCA)*, pages 95–103, 2013.

[41] M. Keller, D. Lefloch, M. Lambers, S. Izadi, T. Weyrich, and A. Kolb. Real-time 3D reconstruction in dynamic scenes using point-based fusion. In *Proc. Conf. 3D Vision (3DV)*, 2013. DOI:10.1109/3DV.2013.9.

[42] B. Labitzke and A. Kolb. Efficient and accurate linear spectral unmixing. In *Proc. IEEE Workshop on Hyperspectral Imaging and Signal Processing (WHISPERS)*, 2013.

[43] D. Lefloch, T. Hoegg, and A. Kolb. Real-time motion artifacts compensation of tof sensors data on GPU. In *Proc. SPIE Defense, Security - Three-Dimensional Imaging, Visualization, and Display*, pages 87380U–87380U–7, 2013.

[44] D. Zukić, A. Vlasák, T. Dukatz, J. Egger, D. Hořínek, C. Nimsky, and A. Kolb. Segmentation of vertebral bodies in mr images. In *Proc. Vision, Modeling and Visualization*, pages 135–142, 2012.

[45] M. Lambers and A. Kolb. Ellipsoidal cube maps for accurate rendering of planetary-scale terrain data. In *Proc. Pacific Graphics(Short Paper)*, number 5–10, 2012.

[46] M. Kahl, A. Keil, J. Peuser, T. Loeffler, M. Paetzold, A. Kolb, T. Sprenger, B. Hils, and P. Haring Bolívar. Stand-off real-time synthetic imaging at mm-wave frequencies. In *Proc. SPIE Defense, Security, and Sensing*, volume 8362. SPIE, 2012. DOI: 10.1117/12.919104.

[47] F. Alghabi, U. Schipper, S. Send, A. Abboud, N. Pashniak, U. Pietsch, and A. Kolb. Real-time processing of pnCCD images using GPUs. In *Proc. Int. Workshop on Radiation Imaging Detectors*, 2012.

[48] J. Moll, C. Rezk-Salama, R.T. Schulte, T. Klinkert, C.-P. Fritzen, and A. Kolb. Interactive simulation and visualization of lamb wave propagation in isotropic and anisotropic structures. In *Journal of Physics: Int. Conf. on Damage Assessment of Structures (DAMAS)*, volume 305, page 012095, 2011.

[49] M. Strickert, B. Labitzke, A. Kolb, and T. Villmann. Multispectral image characterization by partial generalized covariance. In *European Symp. on Artificial Neural Networks, Computational Intelligence and Machine Learning*, 2011. GCOI 28001100817300.

[50] D. Zukić, J. Egger, M. Bauer, D. Kuhnt, B. Carl, B. Freisleben, A. Kolb, and C. Nimsky. Pituitary adenoma - preoperative volume determination. In *Proc. SPIE Medical Imaging*, volume 7963, 2011.

[51] J. Egger, D. Zukić, M. Bauer, D. Kuhnt, B. Carl, B. Freisleben, A. Kolb, and C. Nimsky. Comparison of two human brain tumor segmentation methods for mri data. In *Proc. Russian Bavarian Conf. on Bio-Medical Eng. (RBC*, pages 9–13, 2010.

[52] D. Zukić, J. Egger, M. Bauer, D. Kuhnt, B. Carl, B. Freisleben, A. Kolb, and C. Nimsky. Glioblastoma multiforme segmentation in mri data with a balloon inflation approach. In *Proc. Russian Bavarian Conf. on Bio-Medical Eng. (RBC*, pages 40–44, 2010.

[53] J. Orthmann, M. Keller, and A. Kolb. Topology-caching for dynamic particle volume raycasting. In *Proc. Vision, Modeling and Visualization*, pages 147–154, 2010.

[54] L. Brückbauer, C. Rezk-Salama, and A. Kolb. Relighting spherical light fields with polynomial texture mapping. In *Proc. Vision, Modeling and Visualization*, pages 73–80, 2010.

[55] S. Fuchs, S. Haddadin, M. Keller, S. Parusel, A. Kolb, and M. Suppa. Cooperative bin picking with time-of-flight camera and impedance controlled dlr light-weight robot iii. In *IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS)*, pages 4862–4867, 2010.

[56] M. Banf, M. Barth, H. Schulze, J. Koch, A. Pritzkau, M. Schmidt, A. Daraban, S. Meister, R. Sandhöfer, V. Sotke, C. Rezk-Salama, and A. Kolb. On-demand creation of procedural cities. In *Proc. Game and Entertainment Technologies*, pages 69–76, 2010.

[57] M. Lambers and A. Kolb. Visual assistance tools for interactive visualization of remote sensing data. In *IEEE Int. Geosc. & Remote Sensing Symp. (IGARSS)*, pages 4745–4748, 2010. ISBN: 978-1-4244-9566-5.

[58] J. Orthmann, C. Rezk-Salama, and A. Kolb. Responsive real-time simulation of ground vegetation for games. In *Proc. GAMEON*, pages 30–37, 2009.

[59] J. Orthmann, M. Keller, and A. Kolb. Integrating GPGPU functionality into scene graphs. In *Proc. Vision, Modeling and Visualization*, pages 233–242, 2009.

[60] M. Keller, N. Cuntz, and A. Kolb. Interactive dynamic volume trees on the GPU. In *Proc. Vision, Modeling and Visualization*, pages 165–175, 2009.

[61] S. Wenzel, J. Koch, U. Kelter, and A. Kolb. Evolution analysis with animated and 3D-visualizations. In *IEEE Int. Conf. on Software Maintenance (ICSM), Short Paper*, pages 475–478, 2009. DOI: 10.1109/ICSM.2009.5306279.

[62] M. Lindner and A. Kolb. Compensation of motion artifacts for Time-of-Flight cameras. In *Proc. Dynamic 3D Imaging*, volume 5742 of *LNCS*, pages 16–27. Springer, 2009.

[63] D. Zukić, C. Rezk-Salama, and A. Kolb. Classification of 3d datasets using neural networks. In *Proc. Int. Conf. on Computer Graphics and Artificial Intelligence*, pages 53–62, 2009.

[64] M. Lambers and A. Kolb. Gpu-based framework for distributed interactive 3d visualization of multimodal remote sensing data. In *IEEE Int. Geosc. & Remote Sensing Symp. (IGARSS)*, number 4, pages IV–57 – IV–60, 2009.

[65] J. Chiosa and A. Kolb. Parallel mesh clustering. In *Eurographics Symp. on Parallel Graphics and Visualization*, pages 33–40, 2009.

[66] A. Kolb, E. Barth, R. Koch, and R. Larsen. Time-of-flight sensors in computer graphics. In *Proc. Eurographics (State-of-the-Art Report)*, 2009.

[67] S. Todt, C. Rezk-Salama, L. Brückbauer, and A. Kolb. Progressive light field rendering for web based data presentation. In *Proc. Workshop on Hyper-media 3D Internet*, pages 23–31, 2008.

[68] A. Kolb, E. Barth, and R. Koch. ToF-sensors: New dimensions for realism and interactivity. In *Proc. IEEE Conf. on Computer Vision and Pattern Recognition, Workshop on ToF Camera based Computer Vision (TOF-CV)*, pages 1–6, 2008. DOI 10.1109/CVPRW.2008.4563159.

[69] M. Lindner, A. Kolb, and T. Ringbeck. New insights into the calibration of TOF sensors. In *Proc. IEEE Conf. on Computer Vision and Pattern Recognition, Workshop on ToF Camera based Computer Vision (TOF-CV)*, pages 1–5, 2008. DOI 10.1109/CVPRW.2008.4563172.

[70] S. Todt, C. Rezk-Salama, and A. Kolb. Light field rendering for games. In *Proc. Theory and Practice of Computer Graphics*, pages 27–33, 2008. Best Presentation Award.

[71] M. Lambers and A. Kolb. Automatic point target detection for interactive visual analysis of SAR images. In *IEEE Int. Geosc. & Remote Sensing Symp. (IGARSS)*, volume 2, pages II–903 – II–906, 2008.

[72] I. Chiosa and A. Kolb. Variational multilevel mesh clustering. In *Proc. IEEE Int. Conf. on Shape Modeling and Applications (SMI)*, pages 197–204, 2008.

[73] M. Lambers and A. Kolb. Adaptive dynamic range reduction for SAR images. In *Proc. EUSAR*, pages 371–374, 2008.

[74] T. Horz, A. Pritzkau, C. Rezk, S. Todt, and A. Kolb. Gaming technology in cultural heritage systems. In *Proc. GAMEON*, pages 147–151, 2007.

[75] M. Lindner and A. Kolb. Calibration of the intensity-related distance error of the PMD ToF-camera. In *Proc. SPIE, Intelligent Robots and Computer Vision*, volume 6764, page 67640W, 2007. doi:10.1117/12.752808.

[76] N. Cuntz and A. Kolb. Fast hierarchical 3D distance transforms on the GPU. In *Proc. Eurographics, Short-Paper*, pages 93–96, 2007.

[77] S. Todt, C. Rezk-Salama, T. Horz, A. Pritzkau, and A. Kolb. An interactive exploration of the virtual stronghold Dillenburg. In *Proc. Eurographics, Cultural Heritage Paper*, pages 17–24, 2007.

[78] M. Lindner, A. Kolb, and K. Hartmann. Data-fusion of PMD-based distance-information and high-resolution RGB-images. In *Int. Sym. on Signals Circuits & Systems (ISSCS), session on Algorithms for 3D TOF-cameras*, pages 121–124. IEEE, 2007.

[79] M. Keller, J. Orthmann, A. Kolb, and V. Peters. A simulation-framework for time-of-flight sensors. In *Int. Sym. on Signals Circuits & Systems (ISSCS), session on Algorithms for 3D TOF-cameras*, pages 125–128. IEEE, 2007.

[80] M. Lambers, A. Kolb, and H. Nies. GPU-based framework for interactive visualization of sar data. In *IEEE Int. Geosc. & Remote Sensing Symp. (IGARSS)*, pages 4076–4079. IEEE, 2007.

[81] B. Streckel, B. Bartczak, R. Koch, and A. Kolb. Supporting structure from motion with a 3D-range-camera. In *Scandinavian Conf. Image Analysis (SCIA)*, pages 233–242, 2007.

[82] N. Cuntz, M. Leidl, A. Kolb, C. Rezk-Salama, and M. Böttinger. GPU-based dynamic flow visualization for climate research applications. In *Proc. Simulation and Visualization*, pages 371–384, 2007.

[83] C. Rezk-Salama, S. Todt, L. Brückbauer, T. Horz, T. Knoche, B. Labitzke, M. Leidl, J. Orthmann, H. Payer, M. Piotraschke, T. Schmiade, and A. Kolb. Game development as part of the computer science education. In *Proc. Games Conference*, pages 15–24, 2006.

[84] M. Lindner and A. Kolb. Lateral and depth calibration of pmd-distance sensors. In *Proc. Int. Symp. on Visual Computing*, LNCS, pages 524–533. Springer, 2006.

[85] N. Cuntz and A. Kolb. Fast hierarchical 3D distance transforms on the GPU. Technical report, Computer Graphics Group, University of Siegen, 2006.

[86] J. Mehnert-Spahn, S. Steck, and A. Kolb. A cross-platform approach for user-interaction in virtual environments. In *Proc. 9. IFF Fachtagung zu Virtual Reality und Augmented Reality*, pages 321–328. Fraunhofer IFF, Magdeburg, 2006.

[87] J. Ender, J. Klare, I. Walterscheid, A. R. Brenner, M. Weiß, C. Kirchner, H. Wilden, O. Loffeld, A. Kolb, W. Wiechert, M. Kalkuhl, S. Knedlik, U. Gebhardt, H. Nies, K. Natroshvili, S. Ige, A. Medrano Ortiz, and A. Amankwah. Bistatic exploration using spaceborne and airborne SAR sensors: A close collaboration between FGAN, ZESS and FOMAAS. In *IEEE Int. Geosc. & Remote Sensing Symp. (IGARSS)*, pages 1828–1831. IEEE, 2006.

[88] A. Kolb and C. Rezk-Salama. Efficient empty space skipping for per-pixel displacement mapping. In *Proc. Vision, Modeling and Visualization*, pages 407–414, 2005.

[89] C. Rezk-Salama and A. Kolb. A vertex program for efficient box-plane intersection. In *Proc. Vision, Modeling and Visualization*, pages 115–122, 2005.

[90] C. Bastuck, T.Hambürger, T.Hof, M.Keller, P.Kohlmann, J.Mehnert, S.Nowak, C.Rezk-Salama, and A.Kolb. An open and extensible framework for visualization. In *Tagungsband der Informatiktage*, pages 151–154. Gesellschaft für Informatik, 2005.

[91] A. Kolb and N. Cuntz. Dynamic particle coupling for GPU-based fluid simulation. In *Proc. Symposium on Simulation Technique*, pages 722–727, 2005.

[92] A. Kolb, L. Latta, and C. Rezk-Salama. Hardware-based simulation and collision detection for large particle systems. In *Proc. Graphics Hardware*, pages 123–131. ACM/Eurographics, 2004.

[93] A. Kolb and L. John. Volumetric model repair for virtual reality applications. In *Proc. Eurographics, Short-Paper*, pages 249–256. University of Manchester, 2001. ISSN 1017-4656.

[94] Ph. Slusallek, R. Klein, A. Kolb, and G. Greiner. An object-oriented approach to curves and surfaces. In *Proc. Fourth Eurographics Workshop on Object-Oriented Graphics*, pages 29–39, Sintra, Portugal, 1994.

Tutorials, Posters and Technical Reports

[1] D. Presnov, J. Kurz, J. Dillmann, D. Alt, C. Schubert, A. Kolb, and V. Braun. ICP monitoring visualizes short term ICP fluctuation. approaches recognizing dependencies between the ICP magnitude and duration are not intended for live patient monitoring. icon-based visualization of ICP is a promising alternative new concept with benefits in immediate trend assessment. Proc. Annual Conference German Society of Neurosurgery (DGNC) – Poster, 2023. accepted for publication.

[2] C. Schikora, M. Plack, and A. Kolb. Residuum-condition diagram and reduction of over-complete endmember-sets. Technical report, Computer Graphcis Group, University of Siegen, 2018. `http://arxiv.org/abs/1809.10089`.

[3] T. Hoegg, G. Fiedler, C. Koehler, and A. Kolb. GU-DSL– a generic domain-specific language for data- and image processing. Technical report, University of Siegen, Computer Graphics Group, 2015.

[4] J. Klein, D. Reuling, J. Grimm, A. Pfau, D. Lefloch, M. Lambers, and A. Kolb. User interface for volume rendering in virtual reality environments. Technical report, Computer Graphcis Group, University of Siegen, 2013. `http://arxiv.org/abs/1302.2024`.

[5] R. Cespi, A. Kolb, and M. Lindner. Hand tracking based on hierarchical clustering of range data. Technical report, Computer Graphcis Group, University of Siegen, 2011. `http://arxiv.org/abs/1110.54500`.

[6] A. Kolb. Foundations of time-of-flight cameras and their application to surface reconstruction. MICCAI Workshop on Optical Techniques for 3D Surface Reconstruction in Computer-Assisted Laparoscopic Surgery, Sept. 2011.

[7] A. Kolb, M. Lambers, S. Todt, N. Cuntz, and R Rezk-Salama. Immersive rear projection on curved screens. IEEE VR (Poster-Session), 2009.

[8] N. Cuntz, R. Strzodka, and A. Kolb. Parallel particle level set method on the GPU. Sym. on Interactive 3D Graphics & Games, Seattle, Poster-Session, 2007.

[9] S. Todt, C. Rezk-Salama, and A. Kolb. Real-time fusion of range and light field images. SIGGRAPH Poster-Session, 2005.