Curriculum Vitae of Prof. Dr.-Ing. Gabriel Zachmann

Personal Information

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Birthday: 1967

Scientific Career

Since 2012	Full professor for Computer Graphics and Virtual Reality with University Bremen
2010	Visiting Professor with Nanyang Technological University, Singapore
2005 - 2012	Professor (W2) for Computer Graphics with Clausthal University
2003 - 2005	Head of the Junior Investigator's Group at University Bonn for the research topic "New, Intuitive Interaction Methods for Efficient, Next Generation Virtual Prototyping", funded by the DFG (German Research Foundation) within the *Aktionsplan für Informatik* framework
2001 - 2003	PostDoc with Prof. Dr. Reinhard Klein, head of the computer graphics group at Bonn University
2000	Dr.-Ing. (*summa cum laude*) from Technical University Darmstadt; research topic: "Virtual Reality in Assembly Simulation — Collision Detection, Simulation Algorithms, and Interaction Techniques" Advisors: Prof. Dr.-Ing. J. L. Encarnação, Prof. Carolina Cruz-Neira, PhD
1994 – 2001	Scientific researcher with the Fraunhofer Institute for Computer Graphics, Darmstadt, virtual reality & visualization department
1994	Diploma in computer science (best grade) from Technical University Darmstadt
1994	Research stay with the National Center for Supercomputing Applications in Urbana/ Champaign, Illinois, USA
1990 – 1994	Master's studies in computer science at Technical University Darmstadt, with a minor in mathematics and computer graphics
1988 – 1990	Bachelor studies in computer science at Technical University Karlsruhe, minor in physics

Ten Most Important Publications (Peer Reviewed)

1. Rene Weller, Gabriel Zachmann: kDet - *Parallel Constant Time Collision Detection for Polygonal Objects*. Eurographics, April 2017, Lyon, Computer graphics forum.
2. René Weller, Joscha Cepok, Roman Arzaroli, Kevin Marnholz, Cornelia S. Große, Hauke Reuter, Gabriel Zachmann: *Effects of Immersion and Navigation Agency in Virtual Environments on Emotions and Behavioral Intentions*. Frontiers in Virtual Reality, Section Virtual Reality and Human Behavior September, 2022.
3. Daniel Mohr and Gabriel Zachmann: *Hand pose recognition – overview and current research*. In G. Brunnett, S. Coquillart, R. van Liere, G. Welch, and L. Váša, editors, Virtual Realities, pages 108-129. Springer (Dagstuhl Seminar), 2013.
4. Gabriel Zachmann: *Adaptive Bitonic Sorting*. Encyclopedia of Parallel Computing, pp. 146–157, Springer, 2011.
5. René Weller and Gabriel Zachmann: *ProtoSphere: A GPU-Assisted Prototype-Guided Sphere Packing Algorithm for Arbitrary Objects*. ACM SIGGRAPH ASIA 2010 Sketches, Dec 2010, Seoul, Republic of Korea.
6. Daniel Mohr and Gabriel Zachmann: *FAST: Fast Adaptive Silhouette Area based Template Matching*. Proceedings of the British Machine Vision Conference (BMVC), Sep 2010, pages 39.1-39.12.
7. René Weller, Gabriel Zachmann: *A Unified Approach for Physically-Based Simulations and Haptic Rendering*. ACM SIGGRAPH Video Game Proceedings, Aug 2009, New Orleans, USA.
8. Elmar Langetepe, Gabriel Zachmann: *Geometric Data Structures for Computer Graphics*. AK Peters / CRC Press, 2006.

9. Jan Klein, Gabriel Zachmann: *Point Cloud Surfaces using Geometric Proximity Graphs*. Computers & Graphics, vol. 28, no. 6, 2004, 15 pages.

10. Jan Klein, Gabriel Zachmann: *Point Cloud Collision Detection*. Eurographics 2004, Grenoble.

The complete list of publications can be found at https://cgvr.cs.uni-bremen.de/publications/

Supervised Dissertations

Year	PhD	Title	Advisorship
2012	Rene Weller	*New Geometric Data Structures for Collision Detection* (summa cum laude)	Primary
2012	Daniel Mohr	*Model-Based High-Dimensional Pose Estimation with Application to Hand Tracking*	Primary
2012	Mathias Möhring	*Realistic Interaction with Virtual Objects Within Arm's Reach*	Secondary
2015	Stefan Mock	*Simulation von hoch polydispersen zufällig dichten Partikelpackungen unter Berücksichtigung der Agglomeration im Feinstkornbereich*	Secondary
2015	David Mainzer	*New Geometric Algorithms and Data Structures for Collision Detection of Dynamically Deforming Objects*	Primary
2016	Roman Vlasov	*Design and Development of a VR System for Exploration of Medical Data Using Haptic Rendering and High Quality Visualization*	Secondary
2018	Patrick Draheim	*New Concepts for Virtual Testbeds* (summa cum laude)	Primary
2018	Andreas Tarnowsky	*Modelle zur Synthese taktiler Reize*	Secondary
2019	Michael Otto	*The Virtual Manufacturing Station, A Frame- work for Collaborative Assessment of Manual Assembly Tasks*	Secondary
2019	Mikel Sagardia	*Virtual Manipulations with Force Feedback in Complex Interaction Scenarios*	Secondary
2020	Xizhi Li	*Procedural 3D Asteroid Model Synthesis – A general approach to automatically generate arbitrary 3D asteroid*	Primary
2021	Moritz Cohrs	*New Methodologies for Automotive PLM by Integrating 3D CAD and Virtual Reality into Function-oriented Development*	Primary
2021	Steve Grogorick	*Guiding Visual Attention in Immersive Environments*	Secondary
2022	Matthias Noeker	*Surface Gravity Modelling and Space Gravimeter Development in the Context of Solar System Small Bodies*	Secondary
2023	Roland Fischer	*Novel Algorithms and Methods for Immersive Telepresence and Collaborative VR*	Primary
2024	Max Kaluschke	*Immersive Medical VR Training Simulators with Haptic Feedback*	Primary
2024	Toni Tan	*Geometric Computing for Simulation-Based Robot Planning*	Primary
2025	Andre Mühlenbrock	*Shadow-Free Illumination and Projection in Surgical Environments*	Primary

Research Interests

In general: visual computing, computer graphics, virtual reality, geometric computing, computer vision, human-computer interaction.

In particular: virtual twins for medical simulations, underwater ecosystems, space missions; geometric algorithms and acceleration data structures for computer graphics; collision detection, proximity and intersection computations; virtual reality systems architectures; massively parallel geometric algorithms on the GPU; non-uniform sphere packings and its applications in computer graphics; algorithms in haptics and force-feedback, with applications to medical VR simulations; point cloud processing, e.g., for

tele-presence, autonomous operating room lighting, point cloud processing, etc.; virtual prototyping, in particular virtual assembly simulation; computer vision based, markerless hand pose estimation; immersive, 3D natural user interaction; immersive visualization; dedicated hardware for collision detection.

Professional Services (Selection)

Vice-president of the EuroXR Association since 2022, responsible for academic affairs within the association, in particular the annual conference, the proceedings, and other scientific activities

Chair of the Steering Committee of Eurographics Workshop for Virtual Environments (EGVE), since 2024

Associate Editor with The Visual Computer, since 2021

Associate Editor with Frontiers in Virtual Reality, since 2025

Member of the Conference Committee and Program Co-Chair of EuroXR 2022 and EuroXR 2023

Member of the Steering Committee of the ICAT-EGVE conference since 2014

Member of the Executive Board of the EuroVR Association since 2012

Member of the Conference Committee of IEEE VR since 2008 in various roles

Member of the Steering Committee of VRIPHYS 2015-2019

Member of the Review Panel in the Human Brain Project for the Competitive Call for additional project partners; Jan 2014

External examiner for the M.Sc./P.Grad.Dip. program in Computer Science Interactive Entertainment Technology at the Trinity College Dublin, Ireland; 2013 – 2017

General Co-Chair of the VRIPHYS 2013, 2014 & 2015

Organizer, general chair, and program committee chair of the VRIPHYS 2014 in Bremen, Germany

Organizer, general chair, and program committee chair of the EuroVR Conference in 2014 in Bremen, Germany

Organizer of the EGVE workshop (Eurographics Workshop on Virtual Environments) in 2014 in Bremen, Germany

Member of the executive board („Leitungsgremium“) of the special interest group (SIG) on VR/AR of the German Computer Science Society (GI-Fachgruppe VR/AR), 2013

Member of the program and/or conference committees of various conferences such as VRST, IEEE VR, EGVE, Web3D, JVRC, ICAT-EGVE, World Haptics, etc.

Co-Chair of the Scientific Visualization Contest of the IEEE VisWeek 2011, 2012, and 2013

Area Chair / Associate Editor for Tack II: Virtual Reality and Medical Applications, at ICPR 2012

Member of the review panel "Information and Communication Technologies" for the Cyprus Research Promotion Foundation (RPF) in 2008-2009

Reviewer for the German Science Foundation (DFG) and other funding agencies, such as the Austrian Science Foundation (FFG), and the Investitions und Strukturbank Rheinland Pfalz (ISB)