

# PROF. DR. MARIO BOTSCH

📍 Chair of Computer Graphics  
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🏠 <https://cg.cs.tu-dortmund.de/>

🔄 <https://github.com/mbotsch>



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## PERSONAL INFORMATION

1974 born in Bremen, Germany  
Nationality German  
Marital status lovely wife, cool daughter  
Languages German, English, C++

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## EDUCATION

2005 PhD in Computer Science (Dr. rer. nat., summa cum laude)  
*RWTH Aachen University, Germany*  
1999 MSc in Mathematics (Dipl. Math., summa cum laude)  
*University of Erlangen-Nürnberg, Germany*

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## WORK EXPERIENCE

since 2020 Professor for Computer Graphics  
*Department of Computer Science, TU Dortmund University, Germany*  
2008–2020 Professor for Computer Graphics  
*Faculty of Technology, Bielefeld University, Germany*  
2005–2008 Lecturer & Senior Researcher  
*Computer Graphics Laboratory, ETH Zurich, Switzerland*  
2001–2005 Research assistant & PhD student  
*Computer Graphics Group, RWTH Aachen, Germany*  
1999–2000 Research assistant & PhD student  
*Computer Graphics Group, Max Planck Institute for Informatics, Saarbrücken, Germany*

→ Awards → Funding → Service → Publications → Teaching → Supervision → Publicity

*Last updated: April 22, 2024*

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## AWARDS

### RESEARCH AWARDS

- 2023 Honorable Mention  
*ACM Conference on Motion, Interaction and Games*
- Honorable Mention  
*ACM CHI Conference on Human Factors in Computing Systems*
- 2020 Best Paper Award  
*ACM Symposium on Virtual Reality Software and Technology*
- Best Paper Award  
*Vision, Modeling and Visualization*
- 2019 DIVR Best Impact Award for project ViTraS  
*Deutsches Institut für Virtual Reality*
- 2018 Best Journal Paper Award  
*IEEE Conference on Virtual Reality and 3D User Interfaces (IEEE VR)*
- 2016 Runner-Up for Best Student Paper Award  
*IEEE Congress on Evolutionary Computation*
- 2015 Best Paper Award  
*Eurographics Symposium on Geometry Processing*
- 2014 Best Paper Award  
*International Meshing Roundtable*
- 2013 Eurographics Medical Prize (third place) for the CITmed project  
*Eurographics*
- 2008 Best Student Paper Award  
*Eurographics Symposium on Geometry Processing*
- Best Paper Award  
*Graphics Hardware*
- 2007 Eurographics Young Researcher Award  
*Eurographics Association*
- Best Course Notes Award  
*ACM SIGGRAPH*
- 2006 Best Paper Award  
*Eurographics Symposium on Geometry Processing*
- Borchers Medal for PhD thesis  
*RWTH Aachen*
- Nomination for Dissertation Award of Gesellschaft für Informatik  
*CS department of RWTH Aachen*
- 2004 Best Paper Award  
*Journal of Computers & Graphics*

## TEACHING AWARDS

- 2023 Lehrer-Lämpel-Preis for lecture “Geometric Modeling”, summer term 2023  
*CS department, TU Dortmund University*
- Lehrer-Lämpel-Preis for lecture “Computer Graphics”, winter term 2022/2023  
*CS department, TU Dortmund University*
- 2022 Teaching award (best large course) for lecture “Mathematics for Computer Science”  
*TU Dortmund University*
- Lehrer-Lämpel-Preis for lecture “Geometric Modeling”, summer term 2022  
*CS department, TU Dortmund University*
- Lehrer-Lämpel-Preis for lecture “Computer Animation”, winter term 2021/2022  
*CS department, TU Dortmund University*
- 2021 Lehrer-Lämpel-Preis for lecture “Geometric Modeling”, summer term 2021  
*CS department, TU Dortmund University*
- Lehrer-Lämpel-Preis for lecture “Computer Graphics”, winter term 2020/2021  
*CS department, TU Dortmund University*
- 2020 Golden Chalk for summer term 2020  
*Faculty of Technology, Bielefeld University*
- 2019 Long-Term Excellent Teaching Award, summer term 2019  
*Faculty of Technology, Bielefeld University*
- Golden Chalk for winter term 2018/2019  
*Faculty of Technology, Bielefeld University*
- 2018 Silver Chalk for summer term 2018  
*Faculty of Technology, Bielefeld University*
- Golden Chalk for winter term 2017/2018  
*Faculty of Technology, Bielefeld University*
- 2017 Silver Chalk for winter term 2016/2017  
*Faculty of Technology, Bielefeld University*
- 2014 Silver Chalk for winter term 2013/2014  
*Faculty of Technology, Bielefeld University*
- 2013 Golden Chalk for winter term 2012/13  
*Faculty of Technology, Bielefeld University*
- 2012 Golden Chalk for summer term 2012  
*Faculty of Technology, Bielefeld University*
- 2011 Golden Chalk for summer term 2011  
*Faculty of Technology, Bielefeld University*
- Silver Chalk for winter term 2010/2011  
*Faculty of Technology, Bielefeld University*
- 2010 Golden Chalk for winter term 2009/2010  
*Faculty of Technology, Bielefeld University*

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## PROJECTS & FUNDING

- 2023–2026 “InVirtuo 4.0: Experimental Research in Virtual Environments”  
Funded by Ministry of Culture and Science North Rhine-Westphalia (MKW NRW)  
Total budget €3 M, own budget €204 k.
- 2021–2025 “HyLeC: Hybrid Learning Center”  
Funded by Stiftung Innovation in der Hochschullehre  
Total budget €4.5 M, own budget ca. €940 k.
- 2021–2024 “HyAvA: Hybrid Avatar-Agent Technologies for Social Interaction in XR”  
Funded by Federal Ministry of Education and Research (BMBF)  
Total budget €1.45 M, own budget €280 k.
- 2021–2024 “eTaRDIs: Exploration of Temporal and Spatial Data in Immersive Scenarios”  
Funded by the Federal Ministry of Education and Research (BMBF)  
Total budget €1 M, own budget €272 k.
- 2020–2023 “VIA-VR: Technology Platform for VR Adventures in Medical Therapy”  
Funded by the Federal Ministry of Education and Research (BMBF)  
Total budget €2.1 M, own budget €322 k.
- 2019–2022 “ViTraS: Virtual Reality Therapy by Stimulation of Modulated Body Image”  
Funded by the Federal Ministry of Education and Research (BMBF)  
Total budget €2.5 M, own budget €415 k.
- 2019–2020 “Sparse Geometry Representations for Design Understanding and Cooperative Manipulation”  
Funded by Honda Research Institute Europe  
Budget €92 k.
- 2013–2018 “ICSPACE: Intelligent Coaching Space”  
Funded by German Research Foundation through Excellence Cluster CITEC (DFG EXC 277)  
Coordinator (with S. Kopp and T. Schack), total budget €1.6 M.
- 2015–2017 “KogniHome – The Smart Apartment”  
Funded by the Federal Ministry of Education and Research (BMBF)  
Total budget €11.3 M, own budget €222 k.
- 2014–2017 “Optimality of Adaptive Representations for Dynamic Evolutionary Optimization”  
Funded by Honda Research Institute Europe  
Budget €262 k.
- 2013 “Immersive Virtuelle Experimentier-Umgebung (CAVE)”  
Major Installation (HBFEG Großgerät), funded by State NRW  
Coordinator, budget €300 k.
- 2013 “Non-Rigid Registration of Shoelast”  
Funded by Adidas GmbH, Germany  
Budget €30 k.
- 2012 “Mesh Optimization for Numerical Simulation”  
Funded by ABB Group, Switzerland  
Budget €16 k.
- 2011–2014 “Constrained Deformation for Evolutionary Optimization”  
Funded by Honda Research Institute Europe  
Budget €231 k.

- 2010–2013 “Realtime Acquisition and Dynamic Modeling of Human Faces, Upper-Bodies, and Hands”  
Funded by German Research Foundation (DFG)  
Budget € 202 k.
- 2009–2012 “CITmed: Cognitive Interaction Technology for Medical Applications”  
Funded through program HighTech.NRW by State NRW  
Coordinator, budget € 1.7 M.
- 2009–2010 “Realtime Geometry Acquisition and Reconstruction”  
Funded by Sirona Dental Systems  
Budget € 36 k.
- 2007–2008 “Physically-Based Modeling and Hardware Architectures for Point-Based Graphics”  
Funded by Swiss National Science Foundation (SNF)  
Budget CHF 177 k.

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## SERVICE ACTIVITIES

### CONFERENCE ORGANIZATION

- 2022 Program co-chair, *Vision, Modeling, and Visualization*
- 2017 Program co-chair, *Symposium on Solid and Physical Modeling*  
Conference co-chair, *International Workshop on Virtual Social Interaction*
- 2016 Conference co-chair, *GI Workshop Virtual and Augmented Reality*  
Program co-chair, *Symposium on Solid and Physical Modeling*
- 2015 Program co-chair, *Geometric Modeling & Processing*
- 2011 Program co-chair, *Eurographics Symposium on Geometry Processing*
- 2008 Conference co-chair, *Eurographics Symposium on Point-Based Graphics*
- 2007 Program co-chair, *Eurographics Symposium on Point-Based Graphics*
- 2006 Program co-chair, *Eurographics Symposium on Point-Based Graphics*

### PROGRAM COMMITTEE MEMBERSHIPS

- ACM SIGGRAPH (2009, 2010, 2013, 2014)
- ACM SIGGRAPH Asia (2011, 2012, 2015, 2016, 2019, 2020, 2024)
- Eurographics (2007, 2008, 2010, 2012, 2013, 2015, 2016, 2018, 2020, 2021)
- Eurographics Symp. on Geometry Processing (2007–2010, 2012–2024)
- Eurographics Symp. on Point-Based Graphics (2005)
- Geometric Modeling and Processing (2014, 2018, 2019, 2020)
- SIAM/ACM Geometric and Physical Modeling (2011)
- ACM Symp. on Solid and Physical Modeling (2005, 2006, 2018)
- Pacific Graphics (2006, 2007, 2009, 2010)
- Shape Modeling International (2007–2009, 2011, 2012, 2016, 2017, 2018)
- Vision, Modeling, and Visualization (2006–2009, 2012–2021, 2023)
- Symp. on 3D Data Processing, Visualization, and Transmission (2008)
- Jahrestagung Deutsche Gesellschaft Med. Physik (2008)

## EDITORIAL BOARD MEMBERSHIPS

2015–2019	IEEE Transactions on Visualization and Computer Graphics
2016–2018	Computer-Aided Design
2015–2018	Graphical Models
2013–2016	Computer Graphics Forum
2010–2015	Computer & Graphics

## SERVICE ACTIVITIES AT TU DORTMUND

since 2024	Diversity Commission, CS Department
since 2022	Faculty Conference, CS Department
2021–2023	Chair of Examination Board and Master Admission Board, CS Department
2020–2023	Member of Examination Board and Master Admission Board, CS Department

## SERVICE ACTIVITIES AT BIELEFELD UNIVERSITY

2019–2020	Vice Dean, Faculty of Technology
2018–2020	Senate of Bielefeld University
2016–2020	Teaching Commission, Faculty of Technology
2010–2020	Faculty Conference, Faculty of Technology
2016–2018	Equal Opportunities Commission, Faculty of Technology
2013–2015	<b>Dean, Faculty of Technology</b>
2010–2013	Vice Dean, Faculty of Technology
2010–2013	Senate of Bielefeld University
2009–2011	Teaching Commission, Faculty of Technology
2009–2015	Head of Admission Committee for Bachelor program <i>Media Informatics</i>

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## PUBLICATIONS

This section lists different kinds of publications, such as journal articles, conference papers, books and book chapters, or course notes. For most of these publications, pre-prints, supplementary materials, or videos can be accessed [here](#). My Google Scholar profile can be found [here](#), my ORCID profile [here](#).

### PEER-REVIEWED CONFERENCE & JOURNAL PUBLICATIONS

- [1] Mark Gillespie, Denise Yang, Mario Botsch, Keenan Crane: *Ray Tracing Harmonic Functions*, **ACM Transactions on Graphics** 43(4), 2024, to appear.
- [2] Nina Döllinger, David Mal, Sebastian Keppeler, Erik Wolf, Mario Botsch, Johann Habakuk Israel, Marc Erich Latoschik, Carolin Wienrich: *Virtual Body Swapping: A VR-Based Approach to Embodied Third-Person Self-Processing in Mind-Body Therapy*, Proc. of **ACM CHI Conference on Human Factors in Computing Systems**, 2024, to appear.
- [3] David Mal, Erik Wolf, Nina Döllinger, Mario Botsch, Carolin Wienrich, Marc Erich Latoschik: *From 2D-Screens to VR: Exploring the Effect of Immersion on the Plausibility of Virtual Humans*, Proc. of ACM CHI Conference on Human Factors in Computing Systems (Extended Abstracts), 2024, to appear.

- [4] Stephan Wenninger, Fabian Kemper, Ulrich Schwanecke, Mario Botsch: *TailorMe: Self-Supervised Learning of an Anatomically Constrained Volumetric Human Shape Model*, Computer Graphics Forum 43(2), 2024.
- [5] Astrid Bunge, Dennis Bukenberger, Sven Wagner, Marc Alexa, Mario Botsch: *Polygon Laplacian made Robust*, Computer Graphics Forum 43(2), 2024.
- [6] Nicolas Wagner, Ulrich Schwanecke, Mario Botsch: *SparseSoftDECA: Efficient High-Resolution Physics-Based Facial Animation from Sparse Landmarks*, Computers and Graphics 119, 2024.
- [7] Nicolas Wagner, Ulrich Schwanecke, Mario Botsch: *SoftDECA: Computationally Efficient Physics-Based Facial Animations*, ACM Motion, Interaction and Games, 2023, pp. 11:1–11:11. **Honorable Mention.**
- [8] Nina Döllinger, Matthias Beck, Erik Wolf, David Mal, Mario Botsch, Marc Erich Latoschik, Carolin Wienrich: *“If It’s Not Me It Doesn’t Make a Difference” – The Impact of Avatar Personalization on User Experience and Body Awareness in Virtual Reality*, IEEE International Symposium on Mixed and Augmented Reality, 2023.
- [9] Melanie Derksen, Julia Becker, Mohammad Fazleh Elahi, Angelika Maier, Marius Maile, Ingo Pätzold, Jonas Penningroth, Bettina Reglin, Markus Rothgänger, Philipp Cimiano, Erich Schubert, Silke Schwandt, Thorsten Kuhlen, Mario Botsch, Tim Weisserker: *Who Did What When? Discovering Complex Historical Interrelations in Immersive Virtual Reality*, IEEE International Symposium on Mixed and Augmented Reality, 2023.
- [10] Julia Becker, Mario Botsch, Philipp Cimiano, Melanie Derksen, Mohammad Fazleh Elahi, Angelika Maier, Marius Maile, Ingo Oliver Pätzold, Bettina Reglin, Markus Rothgänger, Silke Schwandt: *Virtual Reality based Access to Knowledge Graphs for History Research*, Proc. of International Conference on Semantic Systems, 2023, pp. 140–160.
- [11] Astrid Bunge, Mario Botsch: *A Survey on Discrete Laplacians for General Polygonal Meshes*, Computer Graphics Forum 42(2), 2023, pp. 521–544.
- [12] Peter Kullmann, Timo Menzel, Mario Botsch, Marc Erich Latoschik: *An Evaluation of Other-Avatar Facial Expression Methods for Social VR*, Proc. of ACM CHI Conference on Human Factors in Computing Systems (Extended Abstracts), 2023, pp. 33:1–33:7.
- [13] Nina Döllinger, Erik Wolf, Mario Botsch, Marc Erich Latoschik, Carolin Wienrich: *Are Embodied Avatars Harmful to our Self-Experience? The Impact of Virtual Embodiment on Body Awareness*, Proc. of ACM CHI Conference on Human Factors in Computing Systems, 2023, pp. 492:1–492:14. **Honorable Mention.**
- [14] Charlotte Roy, Dennis Wiebusch, Mario Botsch, Marc Ernst: *Did it move? Humans use spatio-temporal landmark permanency efficiently for navigation*, Journal of Experimental Psychology, 152(2), 2023, pp. 448–463.
- [15] Erik Wolf, Nina Döllinger, David Mal, Stephan Wenninger, Andrea Bartl, Mario Botsch, Marc Erich Latoschik and Carolin Wienrich: *Does Distance Matter? Embodiment and Perception of Personalized Avatars in Relation to the Self-Observation Distance in Virtual Reality*, Frontiers in Virtual Reality 3, 2022.
- [16] Timo Menzel, Mario Botsch, Marc Erich Latoschik: *Automated Blendshape Personalization for Faithful Face Animations Using Commodity Smartphones*, Proc. of ACM Symposium on Virtual Reality Software and Technology, 2022, pp. 22:1–22:9.
- [17] Erik Wolf, David Mal, Viktor Frohnepfel, Nina Döllinger, Stephan Wenninger, Mario Botsch, Marc Erich Latoschik, Carolin Wienrich: *Plausibility and Perception of Personalized Virtual Humans between Virtual and Augmented Reality*, Proc. of IEEE International Symposium on Mixed and Augmented Reality (ISMAR), 2022, pp. 489–498.

- [18] Nina Döllinger, Erik Wolf, David Mal, Stephan Wenninger, Mario Botsch, Marc Erich Latoschik, Carolin Wienrich: *Resize Me! Exploring the User Experience of Embodied Realistic Modifiable Avatars for Body Image Intervention in Virtual Reality*, *Frontiers in Virtual Reality* 3, 2022.
- [19] Astrid Bunge, Philipp Herholz, Olga Sorkine-Hornung, Mario Botsch, Michael Kazhdan: *Variational Quadratic Shape Functions for Polygons and Polyhedra*, **ACM Transactions on Graphics** 41(4), 2022, pp. 54:1–54:14.
- [20] Dennis Bukenberger, Kevin Buchin, Mario Botsch: *Constructing  $L_\infty$  Voronoi Diagrams in 2D and 3D*. *Computer Graphics Forum* 41(5), 2022, pp. 135–147.
- [21] Cornelia Frank, Felix Hülsmann, Thomas Waltemate, David J. Wright, Daniel L. Eaves, Adam Bruton, Mario Botsch, Thomas Schack: *Motor imagery during action observation in virtual reality: the impact of watching myself performing at a level I have not yet achieved*, *International Journal of Sport and Exercise Psychology*, 2022.
- [22] Nina Döllinger, Erik Wolf, David Mal, Nico Erdmannsdörfer, Mario Botsch, Marc Erich Latoschik, Carolin Wienrich: *Virtual Reality for Mind and Body: Does the Sense of Embodiment Towards a Virtual Body Affect Physical Body Awareness?*, *Proc. of CHI Conference on Human Factors in Computing Systems (Extended Abstracts)*, 2022, pp. 216:1–216:8.
- [23] Andrea Bartl, Stephan Wenninger, Erik Wolf, Mario Botsch, Marc Erich Latoschik: *Affordable but not Cheap: A Case Study of the Effects of Two 3D-Reconstruction Methods of Virtual Humans*, *Frontiers in Virtual Reality* 2, 2021.
- [24] Astrid Bunge, Mario Botsch, Marc Alexa: *The Diamond Laplace for Polygonal and Polyhedral Meshes*, *Computer Graphics Forum* 40(5) (*Proc. of Eurographics Symp. on Geometry Processing*), 2021, pp. 217–230.
- [25] Martin Komaritzan, Stephan Wenninger, Mario Botsch: *Inside Humans: Creating a Simple Layered Anatomical Model from Human Surface Scans*, *Frontiers in Virtual Reality* 2, 2021.
- [26] Erik Wolf, Nathalie Merdan, Nina Döllinger, David Mal, Carolin Wienrich, Mario Botsch, Marc Erich Latoschik: *The Embodiment of Photorealistic Avatars Influences Female Body Weight Perception in Virtual Reality*, *Proc. of IEEE VR*, 2021, pp. 65–74.
- [27] Ilja Arent, Florian Schmidt, Mario Botsch, Volker Dürr: *Marker-less motion capture of insect locomotion with deep neural networks pre-trained on synthetic videos*, *Frontiers in Behavioral Neuroscience* 15, 2021.
- [28] Erik Wolf, Nina Döllinger, David Mal, Carolin Wienrich, Mario Botsch, Marc Erich Latoschik: *Body Weight Perception of Females using Photorealistic Avatars in Virtual and Augmented Reality*, *Proc. of IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*, 2020, pp. 462–473.
- [29] Stephan Wenninger, Jascha Achenbach, Andrea Bartl, Marc Erich Latoschik, Mario Botsch: *Realistic Virtual Humans from Smartphone Videos*, *Proc. of ACM Symposium on Virtual Reality Software and Technology*, 2020, pp. 29:1–29:11. **Best Paper Award**.
- [30] Lars Kammann, Stefan Menzel, Mario Botsch: *A Compact Patch-Based Representation for Technical Mesh Models*, *Proc. of Vision, Modeling and Visualization*, 2020, pp. 1–8. **Best Paper Award**.
- [31] Astrid Bunge, Philipp Herholz, Misha Kazhdan, Mario Botsch: *Polygon Laplacian Made Simple*, *Computer Graphics Forum* 39(2), (*Proc. Eurographics*), 2020, pp. 303–313.
- [32] Lorenz Dehn, Martina Piefke, Max Toepper, Agnes Kohsik, Andreas Rogalewski, Eugen Dyck, Mario Botsch, Wolf-Rüdiger Schäbitz: *Cognitive training in an everyday-like virtual reality enhances visual-spatial memory capacities in stroke survivors with visual field defects*, *Topics in Stroke Rehabilitation*, 27(6), 2020, pp. 442–452.



- [33] Martin Komaritzan, Mario Botsch: *Fast Projective Skinning*, Proc. of ACM Motion, Interaction and Games, 2019, pp. 22:1–22:10.
- [34] Sebastian von Mammen, Andreas Müller, Marc Erich Latoschik, Mario Botsch, Kirstin Brukamp, Carsten Schröder and Michel Wacker: *VIA VR: A Technology Platform for Virtual Adventures for Healthcare and Well-Being*, Proc. of VS-Games 2019.
- [35] Felix Hülsmann, Cornelia Frank, Irene Senna, Marc Ernst, Thomas Schack, Mario Botsch: *Superimposed skilled performance in a virtual mirror improves motor performance and cognitive representation of a full-body motor action*, Frontiers in Robotics and AI, 6(43), 2019.
- [36] Teseo Schneider, Jeremie Dumas, Xifeng Gao, Mario Botsch, Daniele Panozzo, Denis Zorin: *Poly-Spline Finite Element Method*, **ACM Transactions on Graphics** 38(3), 2019, pp. 19:1–19:16.
- [37] Marc Erich Latoschik, Florian Kern, Jan-Philipp Stauffert, Andrea Bartl, Mario Botsch, Jean-Luc Lugin: *Not Alone Here?! Scalability and User Experience of Embodied Ambient Crowds in Distributed Social Virtual Reality*, IEEE Transactions on Visualization and Computer Graphics 25(5), (Proc. **IEEE VR**), 2019, pp. 2133–2144.
- [38] Rebecca Foerster, Christian Poth, Christian Behler, Mario Botsch, Werner Schneider: *Neuropsychological assessment of visual selective attention and processing capacity with head-mounted displays*, Neuropsychology, 33(3), 2019, pp. 309–318.
- [39] Thomas Gietzen, Robert Brylka, Jascha Achenbach, Katja zum Hebel, Elmar Schömer, Mario Botsch, Ulrich Schwanecke, Ralf Schulze: *A method for automatic forensic facial reconstruction based on dense statistics of soft tissue thickness*, PLoS ONE, 14(1), 2019.
- [40] Matthias Schröder, Thomas Waltemate, Jonathan Maycock, Tobias Röhlig, Helge Ritter, Mario Botsch: *Design and Evaluation of Reduced Marker Layouts for Hand Motion Capture*, Computer Animation and Virtual Worlds, 29(6), 2018.
- [41] Felix Hülsmann, Jan-Philipp Göpfert, Barbara Hammer, Stefan Kopp, Mario Botsch: *Classification of motor errors to provide real-time feedback for sports coaching in virtual reality – A case study in squats and Tai Chi pushes*, Computers & Graphics 76, 2018, pp. 47–59.
- [42] Jascha Achenbach, Robert Brylka, Thomas Gietzen, Katja zum Hebel, Elmar Schömer, Ralf Schulze, Mario Botsch, Ulrich Schwanecke: *A Multilinear Model for Bidirectional Craniofacial Reconstruction*, Proc. of Eurographics Workshop on Visual Computing for Biology and Medicine, 2018, pp. 67–76.
- [43] Martin Komaritzan, Mario Botsch: *Projective Skinning*, Proceedings of the ACM on Computer Graphics and Interactive Techniques 1(1), 2018, pp. 12:1–12:19.
- [44] Andreas Richter, Stefan Dresselhaus, Stefan Menzel, Mario Botsch: *Orthogonalization of Linear Representations for Efficient Evolutionary Design Optimization*, Proc. of ACM Genetic and Evolutionary Computation Conference, 2018, pp. 1356–1363.
- [45] Thomas Waltemate, Dominik Gall, Daniel Roth, Mario Botsch, Marc Erich Latoschik: *The Impact of Avatar Personalization and Immersion on Virtual Body Ownership, Presence, and Emotional Response*, IEEE Transactions on Visualization and Computer Graphics 24(4), (Proc. **IEEE VR**), 2018, pp. 1643–1652. **Best journal paper award.**
- [46] Christian Poth, Rebecca Foerster, Christian Behler, Ulrich Schwanecke, Werner Schneider, Mario Botsch: *Ultra-high temporal resolution of visual presentation using gaming monitors and G-Sync*, Behavior Research Methods, 50(1), 2018, pp. 26–38.
- [47] Lorenz Dehn, Leona Kater, Martina Piefke, Mario Botsch, Martin Driessen, Thomas Beblo: *Training in a comprehensive everyday-like virtual reality environment compared to computerized cognitive training for patients with depression*, Computers in Human Behavior 79, 2018, pp. 40–52.

- [48] Jan Philip Göpfert, Christina Göpfert, Mario Botsch, Barbara Hammer: *Effects of Variability in Synthetic Training Data on Convolutional Neural Networks for 3D Head Reconstruction*, Proc. of IEEE Symposium Series on Computational Intelligence, 2017.
- [49] Jascha Achenbach, Thomas Waltemate, Marc Latoschik, Mario Botsch: *Fast Generation of Realistic Virtual Humans*, Proc. of ACM Symposium on Virtual Reality Software and Technology, 2017, pp. 12:1–12:10.
- [50] Marc Latoschik, Daniel Roth, Dominik Gall, Jascha Achenbach, Thomas Waltemate, Mario Botsch: *The Effect of Avatar Realism in Immersive Social Virtual Realities*, Proc. of ACM Symposium on Virtual Reality Software and Technology, 2017, pp. 39:1–39:10.
- [51] Felix Hülsmann, Andreas Richter, Stefan Kopp, Mario Botsch: *Accurate Temporal Alignment for Online Error Analysis of Human Motor Performances*, Proc. of ACM Motion in Games, 2017, pp. 7:1–7:6.
- [52] Charlotte Diehl, Birte Schiffhauer, Friederike Eyssel, Jascha Achenbach, Sören Klett, Mario Botsch, Stefan Kopp: *Get One or Create One: The Impact of Graded Involvement in a Selection Procedure for a Virtual Agent on Satisfaction and Suitability Ratings*, Proc. of International Conference on Intelligent Virtual Agents, 2017, pp. 109–118.
- [53] Iwan de Kok, Felix Hülsmann, Thomas Waltemate, Cornelia Frank, Julian Hough, Thies Pfeiffer, David Schlangen, Thomas Schack, Mario Botsch, Stefan Kopp: *The Intelligent Coaching Space: A Demonstration*, Proc. of International Conference on Intelligent Virtual Agents, 2017, pp. 105–108.
- [54] Roger Blanco i Ribera, Eduard Zell, J.P. Lewis, Junyong Noh, Mario Botsch: *Facial Retargeting with Automatic Range of Motion Alignment*, **ACM Transactions on Graphics** 36(4), (Proc. ACM SIGGRAPH), 2017, pp. 154:1–154:12.
- [55] Andreas Richter, Stefan Menzel, Mario Botsch: *Preference-guided Adaptation of Deformation Representations for Evolutionary Design Optimization*, Proc. of IEEE Congress on Evolutionary Computation, 2017, pp. 2110–2119.
- [56] Sebastian Schindler, Eduard Zell, Mario Botsch, Johanna Kissler, *Differential effects of face-realism and emotion on event-related brain potentials and their implications for the uncanny valley theory*, **Scientific Reports** 7, 45003, 2017.
- [57] Andreas Richter, Jascha Achenbach, Stefan Menzel, Mario Botsch: *Multi-objective Representation Setups for Deformation-based Design Optimization*, Proc. of International Conference on Evolutionary Multi-Criterion Optimization (EMO), Lecture Notes in Computer Science, vol. 10173, 2017, pp. 514–528.
- [58] Rebecca Foerster, Christian Poth, Christian Behler, Mario Botsch, Werner Schneider: *Using the virtual reality device Oculus Rift for neuropsychological assessment of visual processing capabilities*, **Scientific Reports** 3, 37016, 2016.
- [59] Thomas Waltemate, Irene Senna, Felix Hülsmann, Marieke Rohde, Stefan Kopp, Marc Ernst, Mario Botsch: *The Impact of Latency on Perceptual Judgments and Motor Performance in Closed-loop Interaction in Virtual Reality*, Proc. of ACM Symposium on Virtual Reality Software and Technology, 2016, pp. 27–35.
- [60] Katja Wolf, Changil Kim, Henning Zimmer, Christopher Schroers, Mario Botsch, Olga Sorkine-Hornung, Alexander Sorkine-Hornung: *Point Cloud Noise and Outlier Removal for Image-Based 3D Reconstruction*, Proc. of International Conference on 3D Vision, 2016.
- [61] Babak Hosseini, Felix Hülsmann, Mario Botsch, Barbara Hammer: *Non-Negative Kernel Sparse Coding for the Analysis of Motion Data*, Proc. of International Conference on Artificial Neural Networks, 2016, pp. 506–514.

- [62] Andreas Richter, Jascha Achenbach, Stefan Menzel, Mario Botsch: *Evolvability as a Quality Criterion for Linear Deformation Representations in Evolutionary Optimization*, Proc. of IEEE Congress on Evolutionary Computation, 2016, pp. 901–910. **Best student paper runner-up.**
- [63] Daniel Sieger, Sergius Gaulik, Jascha Achenbach, Stefan Menzel, Mario Botsch: *Constrained Space Deformation Techniques for Design Optimization*, Computer Aided Design 72, 2016, pp. 40–51.
- [64] Jonathan Maycock, Tobias Röhlig, Matthias Schröder, Mario Botsch, Helge Ritter: *Fully Automatic Optical Motion Tracking using an Inverse Kinematics Approach*, Proc. of IEEE-RAS International Conference on Humanoid Robots, 2015, pp. 461–466.
- [65] Matthias Schröder, Jonathan Maycock, Mario Botsch: *Reduced Marker Layouts for Optical Motion Capture of Hands*, Proc. of ACM Motion in Games, 2015, pp. 7–16. **One of top-5 papers, invited for a journal submission.**
- [66] Thomas Waltemate, Felix Hülsmann, Thies Pfeiffer, Stefan Kopp, Mario Botsch: *Realizing a Low-latency Virtual Reality Environment for Motor Learning*, Proc. of ACM Symposium on Virtual Reality Software and Technology, 2015, pp. 139–147.
- [67] Iwan de Kok, Julian Hough, Felix Hülsmann, Mario Botsch, David Schlangen, Stefan Kopp: *A Multimodal System for Real-Time Action Instruction in Motor Skill Learning*, Proc. of ACM International Conference on Multimodal Interaction, 2015, pp. 355–362.
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- [72] Andreas Richter, Mario Botsch, Stefan Menzel: *Evolvability of Representations in Complex System Engineering: a Survey*, Proc. of IEEE Congress on Evolutionary Computation, 2015, pp. 1327–1335.
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- [74] Matthias Schröder, Mario Botsch: *Online Adaptive PCA for Inverse Kinematics Hand Tracking*, Proc. of Vision, Modeling and Visualization, 2014, pp. 111–118.
- [75] Daniel Sieger, Stefan Menzel, Mario Botsch: *Constrained Space Deformation for Design Optimization*, Proceedia Engineering 82 (Proc. of International Meshing Roundtable), 2014, pp. 114–126. **Best Paper Award. Invited for a journal submission.**
- [76] Thomas Waltemate, Björn Sommer, Mario Botsch: *Membrane Mapping: Combining Mesoscopic and Molecular Cell Visualization*, Proc. of Eurographics Workshop on Visual Computing for Biology and Medicine, 2014, pp. 89–96.

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## COURSE NOTES

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- [2] Olga Sorkine, Mario Botsch: *Interactive Shape Modeling and Deformation*, Eurographics Tutorial Notes, 2009.
- [3] Mario Botsch, Mark Pauly, Leif Kobbelt, Pierre Alliez, Bruno Levy: *Geometric Modeling Based on Polygonal Meshes*, Eurographics Tutorial Notes, 2008.
- [4] Mario Botsch, Mark Pauly, Leif Kobbelt, Pierre Alliez, Bruno Levy: *Geometric Modeling Based on Polygonal Meshes*, ACM SIGGRAPH Course Notes, 2007. **Best Course Notes Award.**
- [5] Mario Botsch, Mark Pauly, Christian Rössl, Stephan Bischoff, Leif Kobbelt: *Geometric Modeling Based on Triangle Meshes*, Eurographics Tutorial Notes, 2006.
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- [1] Jan Bender, Mario Botsch, Daniel Keim, *Proceedings of Vision, Modeling & Visualization, 2022*.
- [2] Mario Botsch, Stefanie Hahmann, Jessica Zhang (guest editors), *Proceedings of Symposium on Solid & Physical Modeling 2017*, Computer Aided Design 90, 2017.
- [3] Mario Botsch, Stefanie Hahmann, Scott Schaefer (guest editors), *Proceedings of Symposium on Solid & Physical Modeling 2016*, Computer Aided Design 78, 2016.
- [4] Mario Botsch, Falai Chen, Andrew Gillette (guest editors), *Proceedings of Geometric Modeling and Processing 2015*, Computer Aided Geometric Design 35–36, 2015.
- [5] Mario Botsch, Scott Schaefer (guest editors), *Proceedings of the Eurographics Symposium on Geometry Processing 2011*, Computer Graphics Forum 30(5), 2011.
- [6] Mario Botsch, Renato Pajarola (guest editors), *Special Issue on Point-Based Graphics*, Computers & Graphics 32(2), 2008.
- [7] Mario Botsch, Renato Pajarola, Baoquan Chen, Matthias Zwicker (editors), *Proceedings of the Eurographics Symposium on Point-Based Graphics*, Eurographics Association, 2007.
- [8] Mario Botsch, Baoquan Chen, Raghu Machiraju, Torsten Möller (guest editors), *Special Issue on Point-Based and Volume Graphics*, Computers & Graphics 31(2), 2007.
- [9] Mario Botsch, Baoquan Chen, Mark Pauly, Matthias Zwicker (editors), *Proceedings of the Eurographics Symposium on Point-Based Graphics*, Eurographics Association, 2006.

## THESES

- [1] Mario Botsch, *High Quality Surface Generation and Efficient Multiresolution Modeling based on Triangle Meshes*, PhD thesis RWTH Aachen, Shaker Verlag, ISBN 3-8322-4314-3, 2005.
- [2] Mario Botsch, *3D Gesichtsmodellierung zur Operationsplanung*, Master thesis, University of Erlangen-Nürnberg, 1999.

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## TEACHING

### COURSES AT TU DORTMUND UNIVERSITY

since 2020 Computer Graphics,  
Computer Animation,  
Geometric Modeling,  
Scientific Computing,  
Mathematics for Computer Science

### COURSES AT BIELEFELD UNIVERSITY

2008–2020 Introduction to Computer Graphics,  
3D Scanning and Geometry Processing,  
Computer Animation,  
Scientific Computing

### COURSES AT ETH ZURICH

2005–2008 Surface Representations and Geometric Modeling,  
Physically-Based Simulation in Computer Graphics

### COURSES AT INTERNATIONAL CONFERENCES

- 2023 Astrid Bunge, Marc Alexa, Mario Botsch: *Discrete Laplacians for General Polygonal and Polyhedral Meshes*, ACM SIGGRAPH Asia
- 2020 Mario Botsch, Daniel Sieger: *The Polygon Mesh Processing Library*, Eurographics Symposium on Geometry Processing
- 2012 Pierre Alliez, Mario Botsch, Keenan Crane, Julie Digne, Justin Solomon, Etienne Vouga: *Two-day course on Geometry Processing*, Eurographics Symposium on Geometry Processing
- 2011 Pierre Alliez, Mario Botsch, Misha Kazhdan, Mark Pauly: *Two-day course on Geometry Processing*, Eurographics Symposium on Geometry Processing
- 2009 Olga Sorkine, Mario Botsch: *Half-day course on Interactive Shape Modeling and Deformation*, Eurographics
- 2008 Leif Kobbelt, Mario Botsch: *Full-day course on Geometric Modeling Based on Polygonal Meshes*, Eurographics Symposium on Geometry Processing
- 2008 Mario Botsch, Mark Pauly, Leif Kobbelt, Pierre Alliez, Bruno Levy: *Full day course on Geometric Modeling Based on Polygonal Meshes*, Eurographics
- 2007 Mario Botsch, Mark Pauly, Leif Kobbelt, Pierre Alliez, Bruno Levy: *Full-day course on Geometric Modeling Based on Polygonal Meshes*, ACM SIGGRAPH
- 2006 Mario Botsch, Mark Pauly, Christian Rössl, Stephan Bischoff, Leif Kobbelt: *Full-day course on Geometric Modeling Based on Triangle Meshes*, Eurographics
- 2006 Mario Botsch, Mark Pauly, Christian Rössl, Stephan Bischoff, Leif Kobbelt: *Full-day course on Geometric Modeling Based on Triangle Meshes*, ACM SIGGRAPH
- 2006 Mario Botsch, Mark Pauly: *Full-day course on Efficient Geometric Modeling with Polygonal Meshes*, ETH Zürich Industry Course
- 2004 Stephan Bischoff, Mario Botsch, Leif Kobbelt: *Half-day course on Freeform shape representations for efficient geometry processing*, Shape Modeling International

2000 Leif Kobbelt, Stephan Bischoff, Mario Botsch, Kolja Kähler, Christian Rössl, Robert Schneider, Jens Vorsatz: *Full-day course on Geometric modeling based on polygonal meshes*, Eurographics

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## SUPERVISED PHD STUDENTS & POSTDOCS

since 2023 Friedemann Runte  
since 2023 Gerrit Nolte  
since 2023 Fabian Kemper  
since 2021 Nicolas Wagner  
since 2021 Sebastian Hauer  
since 2021 Melanie Derksen  
since 2020 Timo Menzel  
since 2018 Astrid Bunge  
since 2018 Stephan Wenninger

2021–2023 Dr. Dennis Bukenberger  
2016–2022 Dr. Martin Komaritzan  
2019–2020 Lars Kammann  
2013–2018 Dr. Thomas Waltemate  
2014–2019 Dr. Felix Hülsmann  
2012–2020 Dr. Jascha Achenbach  
2012–2018 Dr. Andreas Richter  
2015–2017 Jan Philip Göpfert  
2010–2016 Dr. Eduard Zell  
2012–2015 Dr. Matthias Schröder  
2009–2014 Dr. Daniel Sieger  
2009–2013 Dr. Eugen Dyck  
2010–2012 Marion Dunyach (co-supervised, University of Toulouse)  
2009–2012 Stefan Fröhlich  
2009–2011 Jan Hammerschmidt  
2007–2010 Dr. Sebastian Martin (co-supervised, ETH Zürich)  
2007–2010 Dr. Peter Kaufmann (co-supervised, ETH Zürich)  
2006–2008 Dr. Bern Bickel (co-supervised, ETH Zürich)  
2006–2008 Dr. Simon Heinzle (co-supervised, ETH Zürich)

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## PRESS & PUBLICITY

2023 TV spot “*Mein Körper. Mein (Mehr-)Gewicht*” featuring project ViTraS  
*ARD Wissen*

2021 “Avatar aus Handy-Clips”  
Article in *Heise c't 4/2021*  
TV spot about “Avatar-Maker to go”  
*WDR Lokalzeit*

- 2020 “Informatik der Technischen Universität Dortmund entwickelt einen Avatar-Maker to go”  
*TU Dortmund Press Release (No. 91/2020)*
- 2019 “Avatare gegen Adipositas”  
*Würzburg University Press Release*  
“Computermodell erspart Röntgen”  
Article in *Westfalenblatt*  
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- 2018 TV spot about Virtual Avatars  
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Article in *Westfalenblatt*  
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*Bielefeld University Press Release (No. 189/2017)*  
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Article in *Westfalenblatt*.
- 2016 “Virtual Reha-lity”  
Article in *Focus* 48/2016.  
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Article in *Focus Gesundheit* Dec/Jan 2016/17.  
“VR at the Olympics”  
Article in *Engineering and Technology Magazine (E&T)* 7/2016.  
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Article in *Wunderwelt Wissen* 7/2016  
TV spot about ICSPACE project  
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“Perfektes Training im virtuellen Raum”  
Article in *Neue Westfälische*  
“Der intelligente virtuelle Trainingsraum”  
Article in *Westfalenblatt*  
“Intelligent Bewegung trainieren in der virtuellen Realität”  
*Bielefeld University Press Release (No. 23/2016)*  
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*research\_tv video clip* of Bielefeld University
- 2015 “Forscher der Universität Bielefeld entwickeln Design-Optimierungs-Software”  
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- 2013 TV spot about CITmed project  
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- “Reha im Supermarkt”  
Online article of *Gehirn & Geist*
- “Hirnschäden mit virtueller Realität therapieren”  
*Bielefeld University Press Release* (No. 105/2013)
- 2011 “Maschinen lernen vom Menschen”  
Article in *Westfalenblatt*
- “Gespräche mit virtuellen Menschen”  
Article in *Neue Westfälische*
- 2010 “Reha im virtuellen Supermarkt”  
Article in *Westfalenblatt*
- “Universität Bielefeld erfolgreich im Ziel.NRW-Wettbewerb Hightech.NRW”  
*Bielefeld University Press Release* (No. 51/2010)
- 2009 “Computerspiel, Trickfilm und Modellierung”  
Article in *Westfalenblatt*