Steffen Frey

Date of Birth	22.11.1982
Position	Assistant Professor
Group	Scientific Visualization and Computer Graphics (SVCG)
Institution	University of Groningen (RUG)
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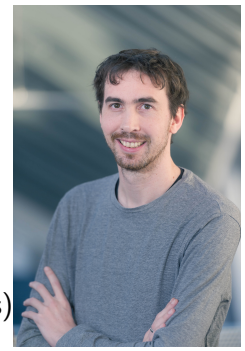
	https://goo.gl/u5R6gT (Google Scholar | h-index 15, 846 citations)
ORCID	0000-0002-1872-6905



Academic Career

since 2020 **Assistant Professor**, *RUG*

2014 – 2020 **Postdoctoral Researcher**, *University of Stuttgart, Visualization Research Center (VISUS)*
Visionary Postdoc, SimTech Cluster of Excellence

2008 – 2014 **Dr. rer. nat.**, *VISUS, date of defense: 07.11.2014*, Supervisor: Prof. Thomas Ertl , "Strategies for Efficient Parallel Visualization" *(summa cum laude)*
Graduate School Simulation Technology, *SimTech Cluster of Excellence*

2010 & 12 **Visiting Researcher**, *University of California, Davis, USA*, Prof. Kwan-Liu Ma, VIDI Labs

2002 – 2008 **Dipl.-Inf.**, *University of Stuttgart*, Computer Science, thesis "GPU-based Cone Beam Reconstruction of Large CT Datasets" in collaboration with Daimler AG

2005 – 2006 **Study Abroad**, *University of Kansas, Lawrence, USA*, with Science Scholarship

Awards

2023 **Best Paper**, *EGPGV*, "Parallel Compositing of Volumetric Depth Images for Interactive Visualization of Distributed Volumes at High Frame Rates" [7]

Teacher of the Year 2022-2023, Runner up, *Computing Science programme of the University of Groningen*

2020 **Best Paper**, *LDAV*, "Foveated Encoding for Large High-Resolution Displays" [19]

2019 **Winner**, *Scientific Visualization Contest 2019 (VIS 2019)*, "Visual Analysis of Structure Formation in Cosmic Evolution" [21]

Honorable Mention, *In Situ Infrastructures for Enabling Extreme-scale Analysis and Visualization (in conjunction with SC19)*, "The Impact of Work Distribution on In Situ Visualization: A Case Study" [28]

Best Paper, *EuroVis (Short Papers)*, "Voronoi-Based Foveated Volume Rendering" [26]

2018 **Best Paper**, *International Conference on Information Visualisation*, "Volume-Based Large Dynamic Graph Analytics" [30]

List of Publications (peer-reviewed, unless noted otherwise)

[1] Gadirov, H., Roerdink, J. B. T. M., **Frey, S.,** *FLINT: Learning-based Flow Estimation and Temporal Interpolation for Scientific Ensemble Visualization [no peer review]*, Sep. 2024. [Online]. Available: https://arxiv.org/abs/2409.19178v1.

[2] Tursun, C., **Frey, S.**, Kosinka, J., "On Foveated Rendering [no peer review]," *Periodiek*, no. 1, 2024. [Online]. Available: https://perio.fmf.nl/archief/perio_2024-1.pdf#page=18.

[3] Zhang, Y., Long, S., Xu, Y., Wang, X., Yao, C., Kosinka, J., **Frey, S.**, Telea, A., Ban, X., "Multiphase viscoelastic non-newtonian fluid simulation," *Computer Graphics Forum*, vol. 43, no. 8, e15180, 2024.

[4] Straub, A., Karadimitriou, N., Reina, G., **Frey, S.**, Steeb, H., Ertl, T., "Visual Analysis of Displacement Processes in Porous Media using Spatio-Temporal Flow Graphs," *IEEE Transactions on Visualization and Computer Graphics*, vol. 30, no. 1, pp. 759–769, Jan. 2024, Conference Name: IEEE Transactions on Visualization and Computer Graphics.

[5] Bauer, R., Ngo, Q. Q., Reina, G., **Frey, S.**, Flemisch, B., Hauser, H., Ertl, T., Sedlmair, M., "Visual Ensemble Analysis of Fluid Flow in Porous Media Across Simulation Codes and Experiment," en, *Transport in Porous Media*, 2023.

[6] Gupta, A., Günther, U., Incardona, P., Reina, G., **Frey, S.**, Gumhold, S., Sbalzarini, I. F., "Efficient Raycasting of Volumetric Depth Images for Remote Visualization of Large Volumes at High Frame Rates," in *2023 IEEE 16th Pacific Visualization Symposium (PacificVis)*, ISSN: 2165-8773, 2023, pp. 61–70.

[7] Gupta, A., Incardona, P., Brock, A., Reina, G., **Frey, S.**, Gumhold, S., Günther, U., Sbalzarini, I. F., *Parallel Compositing of Volumetric Depth Images for Interactive Visualization of Distributed Volumes at High Frame Rates*. The Eurographics Association, 2023.

[8] Wezel, C. S., Verschoore de la Houssaije, W. A., **Frey, S.**, Kosinka, J., "Virtual Ray Tracer 2.0," *Computers & Graphics*, vol. 111, pp. 89–102, 2023.

[9] Bruder, V., Larsen, M., Ertl, T., Childs, H., **Frey, S.,** "A Hybrid In Situ Approach for Cost Efficient Image Database Generation," *IEEE Transactions on Visualization and Computer Graphics*, pp. 1–1, with talk, 2022, Conference Name: IEEE Transactions on Visualization and Computer Graphics.

[10] Tarner, H., Bruder, V., **Frey, S.**, Ertl, T., Beck, F., *Visually Comparing Rendering Performance from Multiple Perspectives*, en. The Eurographics Association, 2022, Accepted: 2022-09-26T09:29:02Z.

[11] Tkachev, G., Cutura, R., Sedlmair, M., **Frey, S.**, Ertl, T., "Metaphorical Visualization: Mapping Data to Familiar Concepts," in *Extended Abstracts of the 2022 CHI Conference on Human Factors in Computing Systems*, ser. CHI EA '22, New York, NY, USA: Association for Computing Machinery, Apr. 2022, pp. 1–10.

[12] Verschoore de la Houssaije, W. A., Wezel, C. S. v., **Frey, S.**, Kosinka, J., *Virtual Ray Tracer*, en. The Eurographics Association, 2022, Accepted: 2022-04-22T07:16:05Z ISSN: 1017-4656.

[13] **Frey, S.**, "Optimizing Grid Layouts for Level-of-Detail Exploration of Large Data Collections," en, *Computer Graphics Forum*, vol. 41, no. 3, pp. 247–258, with talk, 2022.

[14] **Frey, S.**, Scheller, S., Karadimitriou, N., Lee, D., Reina, G., Steeb, H., Ertl, T., "Visual Analysis of Two-Phase Flow Displacement Processes in Porous Media," en, *Computer Graphics Forum*, vol. 41, no. 1, pp. 243–256, 2022, _eprint: https://onlinelibrary.wiley.com/doi/pdf/10.1111/cgf.14432.

[15] Gadirov, H., Tkachev, G., Ertl, T., **Frey, S.,** "Evaluation and Selection of Autoencoders for Expressive Dimensionality Reduction of Spatial Ensembles," in *ISVC '21: Proceedings of the 16th International Symposium on Advances in Visual Computing*, Berlin, Heidelberg: Springer-Verlag, (accepted for publication), 2021.

[16] Heinemann, M., **Frey, S.**, Tkachev, G., Straub, A., Sadlo, F., Ertl, T., "Visual analysis of droplet dynamics in large-scale multiphase spray simulations," en, *Journal of Visualization*, 2021.

[17] Tkachev, G., **Frey, S.**, Ertl, T., "S4: Self-supervised learning of spatiotemporal similarity," *IEEE Transactions on Visualization and Computer Graphics*, pp. 1–1, 2021, Conference Name: IEEE Transactions on Visualization and Computer Graphics.

[18] **Frey, S.**, "Temporally dense exploration of moving and deforming shapes," *Computer Graphics Forum*, vol. 40, no. 1, pp. 7–21, 2021.

[19] Frieß, F., Braun, M., Bruder, V., **Frey, S.**, Reina, G., Ertl, T., "Foveated encoding for large high-resolution displays," *IEEE Transactions on Visualization and Computer Graphics*, vol. 27, no. 2, pp. 1850–1859, Feb. 2021, Conference Name: IEEE Transactions on Visualization and Computer Graphics.

[20] Tkachev, G., **Frey, S.**, Ertl, T., "Local Prediction Models for Spatiotemporal Volume Visualization," *IEEE Transactions on Visualization and Computer Graphics*, vol. 27, no. 7, pp. 3091–3108, Jul. 2021.

[21] Schatz, K., Müller, C., Gralka, P., Heinemann, M., Straub, A., Schulz, C., Braun, M., Rau, T., Becher, M., **Frey, S.**, Reina, G., Sedlmair, M., Weiskopf, D., Ertl, T., Diehl, P., Marcello, D., Frank, J., Müller, T., "2019 IEEE scientific visualization contest winner: Visual analysis of structure formation in cosmic evolution," *IEEE Computer Graphics and Applications*, pp. 1–1, 2020, Conference Name: IEEE Computer Graphics and Applications.

[22] Schneider, M., Flemisch, B., **Frey, S.**, Hermann, S., Iglezakis, D., Ruf, M., Schembera, B., Seeland, A., Steeb, H., "Datenmanagement im SFB 1313," *Bausteine Forschungsdatenmanagement*, no. 1, pp. 28–38, Apr. 2020.

[23] Childs, H., Ahern, S. D., Ahrens, J., Bauer, A. C., Bennett, J., Bethel, E. W., Bremer, P.-T., Brugger, E., Cottam, J., Dorier, M., Dutta, S., Favre, J. M., Fogal, T., **Frey, S.**, Garth, C., Geveci, B., Godoy, W. F., Hansen, C. D., Harrison, C., Hentschel, B., Insley, J., Johnson, C. R., Klasky, S., Knoll, A., Kress, J., Larsen, M., Lofstead, J., Ma, K.-L., Malakar, P., Meredith, J., Moreland, K., Navrátil, P., O'Leary, P., Parashar, M., Pascucci, V., Patchett, J., Peterka, T., Petruzza, S., Podhorszki, N., Pugmire, D., Rasquin, M., Rizzi, S., Rogers, D. H., Sane, S., Sauer, F., Sisneros, R., Shen, H.-W., Usher, W., Vickery, R., Vishwanath, V., Wald, I., Wang, R., Weber, G. H., Whitlock, B., Wolf, M., Yu, H., Ziegeler, S. B., "A terminology for in situ visualization and analysis systems," *The International Journal of High Performance Computing Applications*, vol. 34, no. 6, pp. 676–691, Nov. 1, 2020, Publisher: SAGE Publications Ltd STM.

[24] Bruder, V., Kurzhals, K., **Frey, S.**, Weiskopf, D., Ertl, T., "Space-time volume visualization of gaze and stimulus," *ACM Symposium on Eye Tracking Research & Applications (ETRA)*, 12:1–12:9, 2019.

[25] Bruder, V., Müller, C., **Frey, S.**, Ertl, T., "On evaluating runtime performance of interactive visualizations," *IEEE Transactions on Visualization and Computer Graphics*, pp. 1–1, 2019.

[26] Bruder, V., Schulz, C., Bauer, R., **Frey, S.**, Weiskopf, D., Ertl, T., "Voronoi-based foveated volume rendering," *EuroVis - Short Papers*, 2019.

[27] Fernandes, O., **Frey, S.**, Reina, G., Ertl, T., "Visual representation of region transitions in multi-dimensional parameter spaces," *Smart Tools and Applications in Graphics (STAG)*, 2019.

[28] Rau, T., Gralka, P., Fernandes, O., Reina, G., **Frey, S.**, Ertl, T., "The impact of work distribution on in situ visualization: A case study," *In Situ Infrastructures for Enabling Extreme-scale Analysis and Visualization (ISAV)*, 12:1–12:9, 2019.

[29] Tabiai, I., Tkachev, G., Diehl, P., **Frey, S.**, Ertl, T., Therriault, D., Lévesque, M., "Hybrid image processing approach for autonomous crack area detection and tracking using local digital image correlation results applied to single-fiber interfacial debonding," *Engineering in Fracture Mechanics*, vol. 216, p. 106 485, 2019.

[30] Bruder, V., Hlawatsch, M., **Frey, S.**, Burch, M., Weiskopf, D., Ertl, T., "Volume-Based Large Dynamic Graph Analytics," in *22nd International Conference on Information Visualisation*, 2018.

[31] **Frey, S.**, "Spatio-Temporal Contours from Deep Volume Raycasting," *Comput. Graph. Forum (EuroVis 2018)*, with talk, 2018.

[32] Frieß, F., Landwehr, M., Bruder, V., **Frey, S.**, Ertl, T., "Adaptive encoder settings for interactive remote visualisation on high-resolution displays," *Symposium on Large Data Analysis and Visualization (LDAV)*, 2018.

[33] Hui, Z., **Frey, S.**, Steeb, H., Uribe, D., Ertl, T., Wang, W., "Visualization of bubble formation in porous media," *IEEE Trans. Visual. Comput. Graphics (SciVis 2018)*, 2018.

[34] Bruder, V., **Frey, S.**, Ertl, T., "Prediction-based load balancing and resolution tuning for interactive volume raycasting," *Visual Informatics*, 2017.

[35] Bußler, M., Diehl, P., Pflüger, D., **Frey, S.**, Sadlo, F., Ertl, T., Schweitzer, M. A., "Visualization of fracture progression in peridynamics," *Computers and Graphics*, 2017.

[36] Diehl, P., Bußler, M., Pflüger, D., **Frey, S.**, Ertl, T., Sadlo, F., Schweitzer, M. A., "Extraction of fragments and waves after impact damage in particle-based simulations," in *Meshfree Methods for Partial Differential Equations VIII*, M. Griebel and M. A. Schweitzer, Eds. Cham: Springer International Publishing, 2017, pp. 17–34.

[37] Fernandes, O., **Frey, S.**, Ertl, T., "Transportation-based visualization of energy conversion," Springer, 2017.

[38] **Frey, S.**, Ertl, T., "Fast flow-based distance quantification and interpolation for high-resolution density distributions," in *EG 2017 - Short Papers*, with talk, 2017.

[39] Scharnowski, K., **Frey, S.**, Raffin, B., Ertl, T., "Spline-based decomposition of streamed particle trajectories for efficient transfer and analysis," in *EG 2017 - Short Papers*, 2017.

[40] Tkachev, G., **Frey, S.**, Müller, C., Bruder, V., Ertl, T., "Prediction of Distributed Volume Visualization Performance to Support Render Hardware Acquisition," in *Eurographics Symposium on Parallel Graphics and Visualization*, The Eurographics Association, 2017.

[41] **Frey, S.**, Ertl, T., "Progressive direct volume-to-volume transformation," *IEEE Trans. Visual. Comput. Graphics (SciVis 2016)*, vol. 23, no. 1, pp. 921–930, with talk, 2017.

[42] **Frey, S.**, "Sampling and estimation of pairwise similarity in spatio-temporal data based on neural networks," *Informatics*, vol. 4, no. 27, 2017.

[43] Bruder, V., **Frey, S.**, Ertl, T., "Real-time performance prediction and tuning for interactive volume raycasting," in *SIGGRAPH ASIA 2016 Symposium on Visualization*, ser. SA '16, Macau: ACM, 2016, 7:1–7:8.

[44] Fernandes, O., **Frey, S.**, Ertl, T., "Interpolation-based extraction of representative isosurfaces," in *Lecture Notes in Computer Science*, 2016.

[45] **Frey, S.**, Ertl, T., "Auto-tuning intermediate representations for in situ visualization," in *2016 New York Scientific Data Summit (NYSDS)*, with talk, abstract review only, 2016, pp. 1–10.

[46] **Frey, S.**, Ertl, T., "Flow-based temporal selection for interactive volume visualization," *Comput. Graph. Forum*, 2016.

[47] Schulz, C., Nocaj, A., El-Assady, M., **Frey, S.**, Hlawatsch, M., Hund, M., Karch, G., Netzel, R., Schätzle, C., Butt, M., Keim, D. A., Ertl, T., Brandes, U., Weiskopf, D., "Generative data models for validation and evaluation of visualization techniques," in *Proceedings of the Sixth Workshop on Beyond Time and Errors on Novel Evaluation Methods for Visualization*, ser. BELIV '16, Baltimore, MD, USA: ACM, 2016, pp. 112–124.

[48] Blom, D. S., Ertl, T., Fernandes, O., **Frey, S.**, Klimach, H., Krupp, V., Mehl, M., Roller, S., Sternel, D. C., Uekermann, B., Winter, T., Van Zuijlen, A. H., "Partitioned fluid-structure-acoustics

interaction on distributed data," in *Software for Exascale Computing - SPPEXA 2013-2015*, Springer, Ed., vol. 113, Springer International Publishing, no peer review, 2016, Pages267–291.

[49] Fernandes, O., Blom, D. S., **Frey, S.**, Van Zuijlen, S. H., Bijl, H., Ertl, T., "On in-situ visualization for strongly coupled partitioned fluid-structure interaction," in *VI International Conference on Computational Methods for Coupled Problems in Science and Engineering*, 2015.

[50] **Frey, S.**, Sadlo, F., Ertl, T., "Balanced sampling and compression for remote visualization," in *ACM SIGGRAPH Asia 2015 Symposium on Visualization in High Performance Computing*, with talk, 2015.

[51] Panagiotidis, A., **Frey, S.**, Ertl, T., "Exploratory Performance Analysis and Tuning of Parallel Interactive Volume Visualization on Large Displays," in *EuroVis - Short Papers*, E. Bertini, J. Kennedy, and E. Puppo, Eds., The Eurographics Association, 2015.

[52] Fernandes, O., **Frey, S.**, Sadlo, F., Ertl, T., "Space-time volumetric depth images for in-situ visualization," in *IEEE Symposium on Large Data Analysis and Visualization*, 2014, pp. 59–65.

[53] **Frey, S.**, Sadlo, F., Ma, K., Ertl, T., "Interactive progressive visualization with space-time error control," *IEEE Trans. Visual. Comput. Graphics (SciVis 2014)*, vol. 20, no. 12, pp. 2397–2406, with talk, 2014.

[54] **Frey, S.**, Sadlo, F., Ertl, T., "Explorable volumetric depth images from raycasting," in *Conference on Graphics, Patterns and Images*, with talk, 2013, pp. 123–130.

[55] **Frey, S.**, Sadlo, F., Ertl, T., "Mesh Generation From Layered Depth Images Using Isosurface Raycasting," in *ISVC '13: Proceedings of the 9th International Symposium on Advances in Visual Computing*, Rethymnon, Crete, Greece: Springer-Verlag, with talk, 2013, pp. 373–383.

[56] **Frey, S.**, Reina, G., Ertl, T., "Simt microscheduling: Reducing thread stalling in divergent iterative algorithms," in *IEEE Euromicro International Conference on Parallel, Distributed and Network-based Processing*, with talk, 2012, pp. 399–406.

[57] **Frey, S.**, Sadlo, F., Ertl, T., "Visualization of temporal similarity in field data," *IEEE Trans. Visual. Comput. Graphics (SciVis 2012)*, vol. 18, no. 12, pp. 2023–2032, with talk, 2012.

[58] Ament, M., **Frey, S.**, Sadlo, F., Ertl, T., Weiskopf, D., "Gpu-based two-dimensional flow simulation steering using coherent structures," in *Proceedings of the Second International Conference on Parallel, Distributed, Grid and Cloud Computing for Engineering*, P. Iványi and B. H. V. Topping, Eds., paper 18, Stirlingshire, United Kingdom: Civil-Comp Press, 2011.

[59] **Frey, S.**, Ertl, T., "Load balancing utilizing data redundancy in distributed volume rendering," in *Eurographics Symposium on Parallel Graphics and Visualization*, with talk, 2011, pp. 51–60.

[60] **Frey, S.**, Schlömer, T., Grottel, S., Dachsbacher, C., Deussen, O., Ertl, T., "Loose capacity-constrained representatives for the qualitative visual analysis in molecular dynamics," in *IEEE Pacific Visualization Symposium*, with talk, 2011, pp. 51–58.

[61] Panagiotidis, A., Kauker, D., **Frey, S.**, Ertl, T., "DIANA: A Device Abstraction Framework for Parallel Computations," in *Proceedings of the Second International Conference on Parallel, Distributed, Grid and Cloud Computing for Engineering*, Stirlingshire, United Kingdom: Civil-Comp Press, 2011.

[62] **Frey, S.**, Ertl, T., "PaTraCo: A Framework Enabling the Transparent and Efficient Programming of Heterogeneous Compute Networks," in *EGPGV, Norrköping, Sweden*, Eurographics Association, with talk, 2010, pp. 131–140.

[63] Kauker, D., Sanftmann, H., **Frey, S.**, Ertl, T., "Memory Saving Fourier Transform on GPUs," in *International Conference on Computer and Information Technology*, IEEE, 2010, pp. 67–75.

[64] Üffinger, M., **Frey, S.**, Ertl, T., "Interactive high-quality visualization of higher-order finite elements," *Comput. Graphics Forum (Eurographics 2010)*, vol. 29, no. 2, pp. 337–346, 2010.

[65] Müller, C., **Frey, S.**, Strengert, M., Dachsbacher, C., Ertl, T., "A compute unified system architecture for graphics clusters incorporating data locality," *IEEE Trans. Visual. Comput. Graphics*, vol. 15, no. 4, pp. 605–617, 2009.

[66] **Frey, S.**, Ertl, T., "Accelerating Raycasting Utilizing Volume Segmentation of Industrial CT Data," in *EG UK Theory and Practice of Computer Graphics, Cardiff University, United Kingdom, 2009.*, W. Tang and J. P. Collomosse, Eds., Eurographics Association, with talk, 2009, pp. 33–40.

[67] **Frey, S.**, Müller, C., Strengert, M., Ertl, T., "Concurrent ct reconstruction and visual analysis using hybrid multi-resolution raycasting in a cluster environment," in *Proceedings of the 5th International Symposium on Advances in Visual Computing: Part I*, ser. ISVC '09, Las Vegas, Nevada: Springer-Verlag, with talk, 2009, pp. 357–366.

Acquisition of Research Funding

2024 **Perception-action integration in brain-computer interfaces, robotic task planning, and adaptive visualization**, *Principal Investigator*, FSE Resarch Grant
2 PhD student positions, collaboration with A. Sburlea and H. Kazai

2021 **Visualization of Multi-field Processes in Porous Media**, *Principal Investigator*, project D01 in Collaborative Research Center 1313 (Interface-Driven Multi-Field Processes in Porous Media – Flow, Transport and Deformation), 2nd funding period
PhD student position

2019 **Machine Learning for Data-driven Visualization (ML4Vis)**, *Principal Investigator*, funded project within the SimTech Cluster of Excellence
PhD student position

Quantifying Visual Computing Systems, *Principal Investigator*, project A02 in Transregional Collaborative Research Center 161 (Quantitative Methods for Visual Computing), 2nd funding period
PhD student position

2018 **Visualization of Multi-field Processes in Porous Media**, *Principal Investigator*, project D01 in Collaborative Research Center 1313 (Interface-Driven Multi-Field Processes in Porous Media – Flow, Transport and Deformation)
PhD student position

• Co-Speaker of task force "Software and data"

Data-Integrated Simulation Science (EXC 2075), *Participating Researcher*, proposal for a DFG Cluster of Excellence, PN6: Machine Learning for Simulation

2017 **Model-based Visual Analysis of Large Spatio-Temporal Data**, *Principal Investigator*, funded project within the SimTech Cluster of Excellence
PhD student position

2015 **Quantifying Visual Computing Systems**, *Co-Author*, project A02 in Transregional Collaborative Research Center 161 (Quantitative Methods for Visual Computing)
PhD student position

2011 **MCSimVis: Many Core Simulation and Visualization**, *involvement in proposal*, BMBF Project, with industry partners INTES GmbH and science+computing AG
PhD student position

Invited Presentations, Articles, and Posters

2024 **Interdisciplinary Workshop on Computer Vision Technologies for the Built Environment**, *Visualization of Large Spatio-Temporal Data Collections*, Talk

RUG Applied AI Symposium, *Machine Learning for Large Data Visualization*, Talk

RUG Comp Num Mat Seminar, *Methods and Design Approaches for Fluid Dynamics Visualization*, Talk

2023 **TU/e (Eindhoven) Visualization Seminar**, *Scientific Visualization from an Optimization Perspective*, Talk

2022 **BigVis 2022**, *Visual Mapping, Comparison and Exploration of Large Multifield Data*, Talk

2022 **Dagstuhl Seminar (Anticipatory Human-Machine Interaction)**, *Anticipation of User Performance For Adapting Visualization Systems*, Talk

2021 **Pretty Porous Lecture Series (CRC 1313)**, *Visualization of Multifield Data — Layouts, Features, and Systems*, Talk

2020 **KAUST Conference on Visualization**, *Workshop Invitation*, (postponed)

2018 **Dagstuhl Seminar (In Situ Visualization for Computational Science)**, *Reduced Representation Tradeoffs, Dynamic Prediction and Adjustment*, Talk

2017 **NVIDIA GPU Technology Conference (GTC)**, *Fast Flow-based Distance Quantification and Interpolation for High-Resolution Density Distributions*, Talk

2017 **ChinaVis (China-Germany Visualization Workshop)**, *High Performance Visualization of Volume and Time Series Data*, Talk

2017 **EuroVis**, *Power Efficiency of Volume Raycasting on Mobile Devices*, Poster

2017 **Eurographics**, *Flow-Based Temporal Selection for Interactive Volume Visualization*, Invited Talk of CGF paper

2015 **ISC - Workshop on Software Frameworks for Scalable Scientific Simulations**, *Reduced Representations for In-Situ Visualization*, Talk

2014 **GI BDVC**, *Quantifying Visual Computing Systems*, Talk

2013 **ParCo**, *Interaction and HPC: Multi-Scale / Multi-Physics Applications*, Parallel Interactive Visualization: Strategies and Examples, Talk

2012 **High Performance Visualization: Enabling Extreme-Scale Scientific Insight**, *GPU-Accelerated Visualization*, Book Chapter

2009 **NVIDIA GPU Technology Conference (GTC)**, *Memory Saving Fourier Transform on GPUs*, Talk

2009 **VIS**, *CUDA-Accelerated Continuous 2-D Scatterplots*, Poster

Supervised PhD Students

from 2025 **David Boerema**, *(joint project with A. Sburlea and H. Kazai)*, "Neural Task Planning for Optimizing Visualization and Robot Interaction"

Osman Çağrı , *(joint project with A. Sburlea and H. Kazai)*, "Context-specific Grasping Control and Adaptive Visual Interfaces"

since 2024 **Jiamin Wang**, *(promotor J. Kosinka, Groningen)*, "Data- and model-driven differentiable fluid simulation"

since 2022 **Zikai Yin**, *(promotor J. Kosinka, Groningen)*, "3D Multimodal Registration and Visualization for Augmented Reality Guided Surgery"

since 2021 **Hamid Gadirov**, *(promotor J. Roerdink, Groningen)*, "Automatic Configuration of Scientific Visualization Systems using Optimization and Machine Learning "

since 2018 **Moritz Heinemann**, *SFB TRR 75 (promotor T. Ertl, Stuttgart)*, "Interactive Visualization of Droplet Dynamics"

2018–2020 **Stefan Scheller**, *SFB 1313 (promotor T. Ertl, Stuttgart)*, "Visualization of Multi-field Processes in Porous Media"

since 2017 **Gleb Tkachev**, *SimTech Cluster of Excellence (promotor T. Ertl, Stuttgart)*, "Model-based Visual Analysis of Large Spatio-Temporal Data"

since 2016 **Valentin Bruder**, *SFB TRR 161(promotor T. Ertl, Stuttgart)*, "Quantifying Visual Computing Systems"

Professional Service

Conference / Journal Organization

since 2024 **Journal of Data Science, Statistics, and Visualisation**, Associate Editor

EG Symposium on Parallel Graphics and Visualization (EGPGV), Chair of the Steering Committee

since 2023 **LDAV**, Symposium Chair

EG Symposium on Parallel Graphics and Visualization (EGPGV), Chair of the Steering Committee

2023 **PacificVis 2023**, VisNotes Co-Chair

BigVis 2023, Paper Chair

LDAV 2023, Paper Chair

2022 **PacificVis 2022**, VisNotes Co-Chair

LDAV 2022, Paper Chair

2021 **PacificVis 2021**, Poster Co-Chair

LDAV 2021, Poster Co-Chair

since 2020 **EG Symposium on Parallel Graphics and Visualization (EGPGV)**, Steering Committee Member

2020 **EG Symposium on Parallel Graphics and Visualization (EGPGV)**, Symposium Chair

Symposium on Large Data Analysis and Visualization (LDAV), Poster Co-Chair

2019 **EG Symposium on Parallel Graphics and Visualization (EGPGV)**, Program Co-Chair

2018 **International Conference on Quantification in Visual Computing**, Poster Chair

since 2016 **ISC Workshop on In Situ Visualization (WOIV)**, Organizer

Program Committee

since 2024 **Visualization Meets AI (VisAI)**, workshop held in conjunction with PacificVis

since 2023 **VIS**, *Full Papers Track*

2023 **Supercomputing (SC)**, *Data Analytics, Visualization & Storage track*

Euromicro Conference on Software Engineering and Advanced Applications (SEAAA), *Special Track on AI-Enabled Software Development and Operations*

Visualization Meets AI (VisAI), workshop held in conjunction with PacificVis

2022 **VIS**, *Full Papers Track*

ICPR 2022, Technical Committee – Track 1: Artificial Intelligence, Machine Learning for Pattern Analysis

Visualization Meets AI (VisAI), workshop held in conjunction with PacificVis

International Symposium on Visual Information Communication and Interaction (VINCI)

2021 **VIS**, *Short Papers Track*

International Symposium on Visual Computing (ISVC)

In Situ Infrastructures for Enabling Extreme-scale Analysis and Visualization (ISAV)

Symposium on Large Data Analysis and Visualization (LDAV)

Conference on Graphics, Patterns, and Images (SIBGRAPI)

International Symposium on Vision, Modeling, and Visualization (VMV)

International Symposium on Visual Information Communication and Interaction (VINCI)

2020 **EuroVis**, *Short Papers Track*

VIS, *SciVIS track*

International Conference on Pattern Recognition (ICPR), *Track 1: Artificial Intelligence, Machine Learning for Pattern Analysis*

Visualization Meets AI (VisAI), workshop held in conjunction with PacificVis

Workshop on Big Data Visual Exploration and Analytics (BigVis 2020)

Euromicro Conference on Software Engineering and Advanced Applications (SEAAA), *Special Track on AI-Enabled Software Development and Operations*

International Conference on Advanced Communications and Computation (INFOCOMP)

International Symposium on Visual Computing (ISVC)

International Symposium on Visual Information Communication and Interaction (VINCI)

In Situ Infrastructures for Enabling Extreme-scale Analysis and Visualization (ISAV)

Symposium on Large Data Analysis and Visualization (LDAV)

Conference on Graphics, Patterns, and Images (SIBGRAPI)

International Symposium on Vision, Modeling, and Visualization (VMV)

2019 **International Symposium on Visual Information Communication and Interaction (VINCI)**

Conference on Graphics, Patterns, and Images (SIBGRAPI)

VIS, *SciVIS track*

Euromicro Conference on Software Engineering and Advanced Applications (SEAAA), *Special Track on Software and Big Data Analytics*

International Symposium on Vision, Modeling, and Visualization (VMV)

In Situ Infrastructures for Enabling Extreme-scale Analysis and Visualization (ISAV)

EuroVis, *Short Papers Track*

International Symposium on Visual Computing (ISVC)

Symposium on Large Data Analysis and Visualization (LDAV)

International Conference on Advanced Communications and Computation (INFOCOMP)

2018 **VIS**, *SciVIS track*

Euromicro Conference on Software Engineering and Advanced Applications (SEAAA), *Special Track on Software and Big Data Analytics*

International Symposium on Vision, Modeling, and Visualization (VMV)

In Situ Infrastructures for Enabling Extreme-scale Analysis and Visualization (ISAV)

EuroVis, *Short Papers Track*

International Symposium on Visual Computing (ISVC)

Symposium on Large Data Analysis and Visualization (LDAV)

Supercomputing (SC), *Data Analytics, Visualization & Storage track*

Supercomputing Asia

International Supercomputing Conference (ISC)

International Conference on Advanced Communications and Computation (INFOCOMP)

2017 **EuroVis**, *Short Papers Track*

International Symposium on Visual Computing (ISVC)

Symposium on Large Data Analysis and Visualization (LDAV)

International Supercomputing Conference (ISC)

SIGGRAPH ASIA Symposium on Visualization

2016 **International Symposium on Visual Computing (ISVC)**

Symposium on Large Data Analysis and Visualization (LDAV)

SIGGRAPH ASIA Symposium on Visualization

Professional Societies and Committees

2025 **Co-examiner on the PhD committee of Hagen Tarner in Duisburg-Essen (main supervisor: H. Beck)**

2025 **Co-examiner on the PhD committee of Yanrui Xu in Groningen (main supervisor: J. Kosinka, A. Telea)**

2024 **Co-examiner on the PhD committee of Xueyi Wang in Groningen (main supervisor: D. Karastoyanova, G. Azzopardi)**

2023 **Co-examiner on the PhD committee of Guru Swaroop Bennabhaktula in Groningen (main supervisor: D. Karastoyanova and Prof. E. Alegre)**

2022 **Co-examiner on the PhD committee of G. Tkachev in Stuttgart (main supervisor: T. Ertl)**

Co-examiner on the PhD committee of F. Vernier in Groningen (main supervisor: A. C. Telea)

Co-examiner on the PhD committee of R. van Veen in Groningen (main supervisor: M. Biehl)

Co-examiner on the PhD committee of J. Wang in Groningen (main supervisor: A. C. Telea and J. Kosinka)

2021 **Co-examiner on the PhD committee of V. Bruder in Stuttgart (main supervisor: T. Ertl)**

Co-examiner on the PhD committee of G. Hettinga in Groningen (main supervisor: J. Kosinka)

since 2020 **"Fachgruppe Visualisierung" of the German Informatics Society**

Programme Committee Computing Science at RUG

2017 **Appointment Committee for SimTech Professorship in Machine Learning at the University of Stuttgart**