Steffen Frey

Born 22. November 1982

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Academic Career

since 2020	**Assistant Professor**, *University of Groningen, Scientific Visualization and Computer Graphics*
2014 – 2020	**Postdoctoral Researcher**, *University of Stuttgart, Visualization Research Center (VISUS)*
	Visionary Postdoc, *SimTech Cluster of Excellence (SimTech)*
2008 – 2014	**Dr. rer. nat.**, *VISUS, date of defense: 07.11.2014*, Supervisor: Prof. Thomas Ertl, "Strategies for Efficient Parallel Visualization" *(summa cum laude)*, GS SimTech
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 (see appendix for conference abbreviations)

2023	**Best Paper**, *EGPGV* [12]		2019	**Winner**, *VIS SciVis Contest* [27]
2023	**Teacher of the Year 22/23 (CS), Runner up**		2019	**Honorable Mention**, *ISAV* [34]
2022	**Best Paper**, *EG (Education)* [17]		2019	**Best Paper**, *EuroVis (Short)* [32]
2020	**Best Paper**, *LDAV* [25]		2018	**Best Paper**, *IV* [37]

Funding / (Co-)PI (4-year PhD student positions)

2017 & 21 & 25	**Visualization of Multi-field Processes in Porous Media (SFB 1313)**, *DFG (German Research Foundation); project D01 in Collaborative Research Center 1313 (Interface-Driven Multi-Field Processes in Porous Media – Flow, Transport and Deformation), three funding periods (3rd: final decision pending, individual project: "Excellent")*, with T. Ertl (1st), G. Reina (2nd & 3rd)
2024	**Perception-action integration in brain-computer interfaces, robotic task planning, and adaptive visualization (FSE)**, *FSE Research Grant*, 2 positions, with A. Sburlea and H. Kazai
2019	**Machine Learning for Data-driven Visualization (SimTech)**, *DFG project within SimTech*
2019	**Quantifying Visual Computing Systems (SFB TRR 161)**, *DFG; project A02 in Transregional Collaborative Research Center 161 (Quantitative Methods for Visual Computing), 2nd funding period*
2017	**Model-based Visual Analysis of Large Spatio-Temporal Data**, *DFG project within SimTech*

Funding / CSC PhD positions China Scholarship Council

2021,23,24,25	**supported proposals of Z. Yin, Y. Xu, J. Wang, C. Li**

Funding / Proposal Involvement

2018	**Data-Integrated Simulation Science (SimTech, EXC 2075)**, *Participating Researcher*, proposal for a DFG Cluster of Excellence, PN6: Machine Learning for Simulation
2015	**Quantifying Visual Computing Systems**, *Co-Author*, project A02 in Transregional Collaborative Research Center 161 (Quantitative Methods for Visual Computing) funded by DFG
2011	**MCSimVis: Many Core Simulation and Visualization**, *involvement in proposal*, funded by BMBF (German Federal Ministry of Education and Research), with industry partners INTES GmbH and science+computing AG

PhD Students / Supervisory Team (in Groningen, expected year of graduation +4 from start)

since 2025   **D. Boerema**, *Neural Task Planning for Optimizing Visualization and Robot Interaction*, FSE

since 2025   **O. Çağri**, *Context-specific Grasping Control and Adaptive Visual Interfaces*, FSE

since 2025   **C. Li**, *Multi-modal Medical Image Analysis and Visualization*, CSC

since 2024   **J. Wang**, *Data- and model-driven differentiable fluid simulation*, CSC

since 2022   **Z. Yin**, *3D Multimodal Registration and Visualization for Augmented Reality Guided Surgery*, CSC

2022-25   **Y. Xu**, *Smoothed Particle Hydrodynamics Simulation in Computer Graphics*, CSC

since 2021   **H. Gadirov**, *Automatic Configuration of Scientific Visualization Systems using Optimization and Machine Learning*, Defense: 14th October 2025

PhD Students / Supervision Involvement

2020-25	**H. Tarner**, *Duisburg-Essen*, co-examiner	2018-20	**S. Scheller**, *Stuttgart*, SFB 1313, unfinished
2020-24	**A. Gupta**, *Dresden (TU & Max Planck)*	2017-22	**G. Tkachev**, *Stuttgart*, SimTech, co-examiner
2021-25	**A. Straub**, *Stuttgart*, SFB 1313	2016-21	**V. Bruder**, *Stuttgart*, SFB TRR 161, co-examiner
2018-19,25	**M. Heinemann**, *Stuttgart*, SFB 1313	2014-18	**O. Fernandes**, *Stuttgart*, unfinished

Service / Conference & Journal Organization

since 2024	**JDSSV**, Associate Editor	2022 & 23	**LDAV**, *Paper Chair*
since 2016	**WOIV**, Organizer	2021	**LDAV**, *Poster Chair*
since 2020	**EGPGV**, Steering Committee	2022 & 23	**PacificVis**, *VisNotes Co-Chair*
since 2023	**EGPGV**, Chair of Steering Committee	2021	**PacificVis**, *Poster Co-Chair*
2020	**EGPGV**, Symposium Chair	2023	**BigVis**, *Paper Chair*
2019	**EGPGV**, Program Co-Chair	2018	**QiVC**, Poster Chair
since 2024	**LDAV**, Symposium Chair		

Service / Program Committee

2021 & 25	**VIS**, *Short*	2018 & 23	**SC**	2018-2021	**ISAV**	2018-20	**INFOCOMP**
2025	**VIS**, *Uncertainty*	2018-23	**SEAAA**	2016-21	**LDAV**	2018	**SC Asia**
since 2019	**SIBGRAPI**	2020 & 22	**ICPR**	2018-21	**VMV**	2017-18	**ISC**
since 2020	**VisAI**	2019-22	**VINCI**	2017-20	**EuroVis**, *Short*	2016 & 17	**SA Asia Vis**
since 2018	**VIS**, *Full*	2016-21	**ISVC**	2020	**BigVis**		

Service / PhD Co-Examiner

2025	**Duisburg-Essen**, *H. Tarner*
2021 & 2022	**Stuttgart**, *V. Bruder & G. Tkachev*
from 2021	**Groningen**, *G. Hettinga, J. Wang, R. van Veen, F. Vernier, G. Swaroop & X. Wang*

Service / Boards & Committees

2025	**CS program audit (RUG)**, *Teaching Staff Member*
2021 & 2023	**Appointment Committee for Assistant Professors**, *Groningen*
2021-23	**Curriculum Committee Focus Group**, *Data track & Visual Computing, BSc CS (RUG)*
since 2021	**Programme Committee CS**, *Groningen*
since 2020	**"Fachgruppe Visualisierung"**, *German Informatics Society*
2018-20	**Co-Speaker of task force "Software and data"**, *Stuttgart, SFB 1313*
2017	**Appointment Committee for SimTech Professorship in Machine Learning**, *Stuttgart*

Teaching / Courses in Groningen

from 20/21	**Lecture**, *Algorithms and Data Structures in C*, BSc, 5 ECTS, Lecturer
from 21/22	**Lecture**, *Scientific Visualization*, MSc, 5 ECTS, Lecturer
20/21-23/24	**Lecture**, *Introduction to CS*, Tutor

Teaching / Courses in Stuttgart (Co-Lecturer)

SS 2015–20	**Lecture**, *Scientific Visualization*, MSc	WS 2017/18	**Seminar**, *Multifield Problems*, MSc/PhD
WS 2019/20	**Seminar**, *Advanced Rendering*, MSc	WS 2016/17	**Seminar**, *High-Performance Visualization*, MSc
SS 2019	**Seminar**, *Realistische Echtzeitgrafik*, BSc	WS 2015/16	**Seminar**, *Virtual Reality*, MSc
WS 2018/19	**Seminar**, *Particle Visualization*, MSc	WS 2015/16	**Lecture**, *Programming for Media CS*, BSc
SS 2018 & 19	**Lecture**, *Simulation Technology B*, MSc	SS 2015	**Seminar**, *SimTech*, MSc/PhD
WS 2017/18	**Seminar**, *Multifield Visualization*, MSc		

Teaching / BSc & MSc Students (since 2021, main supervisor)

RUG	**MSc**, *E. Waterink, J. Boonstra, S. Rouzbahani, A. Feltham, D. Boerema, L. D. Grandis*
RUG	**BSc**, *A. Thioux, M. R. Westra, L. van der Waal [2], P. Blesinger [2], C. Panagioutou, C. N. Iacob, J. Trooster*
RUG	**MSc (Intern)**, *E. Waterink [23], J. de Baat, M. R. Westra, S. J. Hilhorst, L. Manuel, L. v. d. Waal*
RUG	**Honors College**, *A. Dibajeh (2021/22)*
Stuttgart	**MSc**, *A. Zeyfang (2021), M. Kleber (2025), N. Hauf (2025)*

Invitations / Presentations

2024	**DEEA**	2017	**NVIDIA GTC**
2024	**RUG Applied AI Symposium**	2017	**China-Germany Visualization Workshop**
2024	**RUG Comp Num Mat Seminar**	2015	**ISC (Workshop)**
2023	**TU/e (Eindhoven) Visualization Seminar**	2014	**GI BDVC**
2022	**BigVis 2022**	2013	**ParCo (Workshop)**
2021	**Pretty Porous Lecture Series (SFB 1313)**	2009	**NVIDIA GTC**

Invitations / Other

2022	**Dagstuhl Seminar**, *Anticipatory Human-Machine Interaction*
2018	**Dagstuhl Seminar**, *In Situ Visualization for Computational Science*
2012	**High Performance Visualization: Enabling Extreme-Scale Scientific Insight**, *book chapter*

Professionalization and Training Courses

2026	**Academic Leadership**, *registered*	2021	**Dutch Language**, *→A2 & A2→B1*
2023	**University Teaching Qualification (UTQ)**	2021	**How to select PhD students**
2023	**Coaching PhD students**	2021	**ERC Starting and Consolidator**

List of Publications (peer-reviewed, unless noted otherwise; talks at conference as indicated)

[1] **Frey, S.**, ``Agri: Adaptive thumbnails for grid-based visualizations,'' in *Proceedings of the IEEE Visualization Conference (Short Papers)*, To appear, talk at IEEE VIS 25, 2025.

[2] Wal, L., Blesinger, P., Kosinka, J., **Frey, S.**, ``VVRT: Virtual Volume Raycaster,'' in *EuroVis 2025 - Education Papers*, The Eurographics Association, 2025. DOI: 10.2312/eved.20251021.

[3] Bauer, R., Ngo, Q. Q., Reina, G., **Frey, S.**, Sedlmair, M., ``Voronoi cell interface-based parameter sensitivity analysis for labeled samples,'' *Computer Graphics Forum*, vol. 44, no. 3, 2025. DOI: 10.1111/cgf.70122.

[4] **Frey, S.**, ``Sca2Gri: Scalable gridified scatterplots,'' *Computer Graphics Forum*, vol. 44, no. 3, 2025, talk at EuroVIS 25. DOI: 10.1111/cgf.70141.

[5] Gadirov, H., Wu, Q., Bauer, D., Ma, K.-L., Roerdink, J., **Frey, S.,** ``HyperFLINT: Hypernetwork-based flow estimation and temporal interpolation for scientific ensemble visualization,'' *Computer Graphics Forum*, vol. 44, no. 3, 2025. DOI: 10.1111/cgf.70134.

[6] Shen, L., Zhang, Y., **Frey, S.,** Telea, A., Kosinka, J., Wang, X., Ban, X., ``Visual simulation of bone cement blending and dynamic flow,'' IEEE Computer Society, 2024, pp. 6226–6233. DOI: 10.1109/BIBM62325.2024.10822238.

[7] Tursun, C., **Frey, S.,** Kosinka, J., ``On Foveated Rendering [no peer review],'' *Periodiek*, no. 1, 2024.

[8] 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. DOI: https://doi.org/10.1111/cgf.15180.

[9] 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, 2024. DOI: 10.1109/TVCG.2023.3326931.

[10] 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,'' *Transport in Porous Media*, 2023. DOI: 10.1007/s11242-023-02019-y.

[11] 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. DOI: 10.1109/PacificVis56936.2023.00014.

[12] 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. DOI: 10.2312/pgv.20231082.

[13] 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. DOI: 10.1016/j.cag.2023.01.005.

[14] 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*, vol. 29, no. 9, pp. 3788–3798, 2023, with talk, DOI: 10.1109/TVCG.2022.3169590.

[15] Tarner, H., Bruder, V., **Frey, S.,** Ertl, T., Beck, F., *Visually Comparing Rendering Performance from Multiple Perspectives.* The Eurographics Association, 2022. DOI: 10.2312/vmv.20221211.

[16] 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, 2022, pp. 1–10. DOI: 10.1145/3491101.3516393.

[17] Verschoore de la Houssaije, W. A., Wezel, C. S. v., **Frey, S.,** Kosinka, J., *Virtual Ray Tracer.* The Eurographics Association, 2022, Accepted: 2022-04-22T07:16:05Z ISSN: 1017-4656. DOI: 10.2312/eged20221045.

[18] **Frey, S.,** ``Optimizing Grid Layouts for Level-of-Detail Exploration of Large Data Collections,'' *Computer Graphics Forum*, vol. 41, no. 3, pp. 247–258, 2022, with talk, DOI: 10.1111/cgf.14537.

[19] **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,'' *Computer Graphics Forum*, vol. 41, no. 1, pp. 243–256, 2022. DOI: 10.1111/cgf.14432.

[20] 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, 2021.

[21] Heinemann, M., **Frey, S.,** Tkachev, G., Straub, A., Sadlo, F., Ertl, T., ``Visual analysis of droplet dynamics in large-scale multiphase spray simulations,'' *Journal of Visualization*, 2021. DOI: 10.1007/s12650-021-00750-6.

[22] Tkachev, G., **Frey, S.,** Ertl, T., ``S4: Self-supervised learning of spatiotemporal similarity,'' *IEEE Transactions on Visualization and Computer Graphics*, pp. 1–1, 2021. DOI: 10.1109/TVCG.2021.3101418.

[23] Waterink, E., Kosinka, J., **Frey, S.,** ``Visual Analysis of Popping in Progressive Visualization,'' in *Smart Tools and Apps for Graphics - Eurographics Italian Chapter Conference*, P. Frosini, D. Giorgi, S. Melzi, and E. Rodolà, Eds., The Eurographics Association, 2021. DOI: 10.2312/stag.20211485.

[24] **Frey, S.,** ``Temporally dense exploration of moving and deforming shapes,'' *Computer Graphics Forum*, vol. 40, no. 1, pp. 7–21, 2021. DOI: https://doi.org/10.1111/cgf.14092.

[25] 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, 2021. DOI: `10.1109/TVCG.2020.3030445`.

[26] 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, 2021. DOI: `10.1109/TVCG.2019.2961893`.

[27] 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. DOI: `10.1109/MCG.2020.3004613`.

[28] 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, 2020. DOI: `10.17192/bfdm.2020.1.8085`.

[29] 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, 1, 2020, Publisher: SAGE Publications Ltd STM. DOI: `10.1177/1094342020935991`.

[30] 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. DOI: `10.1109/TVCG.2019.2898435`.

[31] Bruder, V., Kurzhals, K., **Frey, S.**, Weiskopf, D., Ertl, T., ``Space-time volume visualization of gaze and stimulus,'' in *Proceedings of the 11th ACM Symposium on Eye Tracking Research & Applications*, ser. ETRA '19, Denver, Colorado: Association for Computing Machinery, 2019. DOI: `10.1145/3314111.3319812`.

[32] Bruder, V., Schulz, C., Bauer, R., **Frey, S.**, Weiskopf, D., Ertl, T., ``Voronoi-Based Foveated Volume Rendering,'' in *EuroVis 2019 - Short Papers*, J. Johansson, F. Sadlo, and G. E. Marai, Eds., The Eurographics Association, 2019. DOI: `10.2312/evs.20191172`.

[33] Fernandes, O., **Frey, S.**, Reina, G., Ertl, T., ``Visual representation of region transitions in multi-dimensional parameter spaces,'' in *Italian Chapter Conference 2019 - Smart Tools and Apps in computer Graphics, STAG 2019, Cagliari, Italy, November 14-15, 2019*, M. Agus, M. Corsini, and R. Pintus, Eds., Eurographics Association, 2019, pp. 89–100. DOI: `10.2312/STAG.20191367`.

[34] 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 *Proceedings of the Workshop on In Situ Infrastructures for Enabling Extreme-Scale Analysis and Visualization*, ser. ISAV '19, Denver, Colorado, USA: Association for Computing Machinery, 2019, pp. 17–22. DOI: `10.1145/3364228.3364233`.

[35] 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. DOI: `https://doi.org/10.1016/j.engfracmech.2019.106485`.

[36] Zhang, H., **Frey, S.**, Steeb, H., Uribe, D., Ertl, T., Wang, W., ``Visualization of bubble formation in porous media,'' *IEEE Transactions on Visualization and Computer Graphics*, vol. 25, no. 1, pp. 1060–1069, 2019. DOI: `10.1109/TVCG.2018.2864506`.

[37] Bruder, V., Hlawatsch, M., **Frey, S.**, Burch, M., Weiskopf, D., Ertl, T., ``Volume-based large dynamic graph analytics,'' in *2018 22nd International Conference Information Visualisation (IV)*, 2018, pp. 210–219. DOI: `10.1109/iV.2018.00045`.

[38] **Frey, S.**, ``Spatio-Temporal Contours from Deep Volume Raycasting,'' *Comput. Graph. Forum (EuroVis 2018)*, 2018, with talk, DOI: `10.1111/cgf.13438`.

[39] Frieß, F., Landwehr, M., Bruder, V., **Frey, S.**, Ertl, T., ``Adaptive encoder settings for interactive remote visualisation on high-resolution displays,'' in *2018 IEEE 8th Symposium on Large Data Analysis and Visualization (LDAV)*, 2018, pp. 87–91. DOI: `10.1109/LDAV.2018.8739215`.

[40] Bruder, V., **Frey, S.**, Ertl, T., ``Prediction-based load balancing and resolution tuning for interactive volume raycasting,'' *Visual Informatics*, 2017. DOI: `https://doi.org/10.1016/j.visinf.2017.09.001`.

[41] 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. DOI: `https://doi.org/10.1016/j.cag.2017.05.003`.

[42] 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. DOI: `10.1007/978-3-319-51954-8_2`.

[43] Fernandes, O., **Frey, S.**, Ertl, T., ``Transportation-based visualization of energy conversion,'' in *Proceedings of the 12th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications*, Springer, 2017. DOI: `10.5220/0006098200520063`.

[44] **Frey, S.**, Ertl, T., ``Fast flow-based distance quantification and interpolation for high-resolution density distributions,'' in *Proceedings of the European Association for Computer Graphics: Short Papers*, ser. EG '17, with talk, Lyon, France: Eurographics Association, 2017, pp. 37–40. DOI: `10.2312/egsh.20171009`.

[45] Scharnowski, K., **Frey, S.**, Raffin, B., Ertl, T., ``Spline-based decomposition of streamed particle trajectories for efficient transfer and analysis,'' in *Proceedings of the European Association for Computer Graphics: Short Papers*, ser. EG '17, Lyon, France: Eurographics Association, 2017, pp. 41–44. DOI: `10.2312/egsh.20171010`.

[46] 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. DOI: `10.2312/pgv.20171089`.

[47] **Frey, S.**, Ertl, T., ``Progressive direct volume-to-volume transformation,'' *IEEE Trans. Visual. Comput. Graphics (SciVis 2016)*, vol. 23, no. 1, pp. 921–930, 2017, with talk, DOI: `10.1109/TVCG.2016.2599042`.

[48] **Frey, S.**, ``Sampling and estimation of pairwise similarity in spatio-temporal data based on neural networks,'' *Informatics*, vol. 4, no. 27, 2017. DOI: `10.3390/informatics4030027`.

[49] Fernandes, O., **Frey, S.**, Ertl, T., ``Interpolation-based extraction of representative isosurfaces,'' vol. 10072, 2016, pp. 403–413. DOI: `10.1007/978-3-319-50835-1_37`.

[50] 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. DOI: `10.1145/3002151.3002156`.

[51] **Frey, S.**, Ertl, T., ``Auto-tuning intermediate representations for in situ visualization,'' in *2016 New York Scientific Data Summit (NYSDS)*, 2016, pp. 1–10. DOI: `10.1109/NYSDS.2016.7747807`.

[52] **Frey, S.**, Ertl, T., ``Flow-based temporal selection for interactive volume visualization,'' *Comput. Graph. Forum*, 2016, presented at EuroVIS 2017. DOI: `10.1111/cgf.13070`.

[53] 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. DOI: `10.1145/2993901.2993907`.

[54] 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, 2016, Pages267–291. DOI: `10.1007/978-3-319-40528-5`.

[55] 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.

[56] **Frey, S.**, Sadlo, F., Ertl, T., ``Balanced sampling and compression for remote visualization,'' in *SIGGRAPH Asia 2015 Visualization in High Performance Computing*, ser. SA '15, with talk, Kobe, Japan: Association for Computing Machinery, 2015. DOI: `10.1145/2818517.2818529`.

[57] 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. DOI: `10.2312/eurovisshort.20151118`.

[58] Fernandes, O., **Frey, S.**, Sadlo, F., Ertl, T., ``Space-time volumetric depth images for in-situ visualization,'' in *2014 IEEE 4th Symposium on Large Data Analysis and Visualization (LDAV)*, 2014, pp. 59–65. DOI: 10.1109/LDAV.2014.7013205.

[59] **Frey, S.**, Sadlo, F., Ma, K.-L., Ertl, T., ``Interactive progressive visualization with space-time error control,'' *IEEE Transactions on Visualization and Computer Graphics*, vol. 20, no. 12, pp. 2397–2406, 2014, with talk, DOI: 10.1109/TVCG.2014.2346319.

[60] **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*, with talk, Rethymnon, Crete, Greece: Springer-Verlag, 2013, pp. 373–383.

[61] **Frey, S.**, Sadlo, F., Ertl, T., ``Explorable volumetric depth images from raycasting,'' in *2013 XXVI Conference on Graphics, Patterns and Images*, with talk, 2013, pp. 123–130. DOI: 10.1109/SIBGRAPI.2013.26.

[62] **Frey, S.**, Reina, G., Ertl, T., ``SIMT microscheduling: Reducing thread stalling in divergent iterative algorithms,'' in *2012 20th Euromicro International Conference on Parallel, Distributed and Network-based Processing*, with talk, 2012, pp. 399–406. DOI: 10.1109/PDP.2012.62.

[63] **Frey, S.**, Sadlo, F., Ertl, T., ``Visualization of temporal similarity in field data,'' *IEEE Transactions on Visualization and Computer Graphics*, vol. 18, no. 12, pp. 2023–2032, 2012, with talk, DOI: 10.1109/TVCG.2012.284.

[64] 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*, 2011. DOI: 10.4203/ccp.95.18.

[65] **Frey, S.**, Ertl, T., ``Load balancing utilizing data redundancy in distributed volume rendering,'' in *Proceedings of the 11th Eurographics Conference on Parallel Graphics and Visualization*, ser. EGPGV '11, with talk, Llandudno, UK: Eurographics Association, 2011, pp. 51–60. DOI: 10.5555/2386230.2386238.

[66] **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 *2011 IEEE Pacific Visualization Symposium*, with talk, 2011, pp. 51–58. DOI: 10.1109/PACIFICVIS.2011.5742372.

[67] 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. DOI: 10.4203/ccp.95.20.

[68] **Frey, S.**, Ertl, T., ``PaTraCo: A Framework Enabling the Transparent and Efficient Programming of Heterogeneous Compute Networks,'' in *Eurographics Symposium on Parallel Graphics and Visualization*, J. Ahrens, K. Debattista, and R. Pajarola, Eds., with talk, The Eurographics Association, 2010. DOI: 10.2312/EGPGV/EGPGV10/131-140.

[69] Kauker, D., Sanftmann, H., **Frey, S.**, Ertl, T., ``Memory saving discrete fourier transform on gpus,'' in *2010 10th IEEE International Conference on Computer and Information Technology*, 2010, pp. 1152–1157. DOI: 10.1109/CIT.2010.209.

[70] Üffinger, M., **Frey, S.**, Ertl, T., ``Interactive high-quality visualization of higher-order finite elements,'' *Computer Graphics Forum*, vol. 29, no. 2, pp. 337–346, 2010. DOI: https://doi.org/10.1111/j.1467-8659.2009.01603.x.

[71] **Frey, S.**, Ertl, T., ``Accelerating Raycasting Utilizing Volume Segmentation of Industrial CT Data,'' in *Theory and Practice of Computer Graphics*, W. Tang and J. Collomosse, Eds., with talk, The Eurographics Association, 2009. DOI: 10.2312/LocalChapterEvents/TPCG/TPCG09/033-040.

[72] **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, with talk, Las Vegas, Nevada: Springer-Verlag, 2009, pp. 357–366. DOI: 10.1007/978-3-642-10331-5_34.

[73] Müller, C., **Frey, S.**, Strengert, M., Dachsbacher, C., Ertl, T., ``A compute unified system architecture for graphics clusters incorporating data locality,'' *IEEE Transactions on Visualization and Computer Graphics*, vol. 15, no. 4, pp. 605–617, 2009. DOI: 10.1109/TVCG.2008.188.

Appendix: Conference & Journal Abbreviations

Abbreviation	Full Name
BigVis	Workshop on Big Data Visual Exploration and Analytics
EuroVis	Eurographics/IEEE Symposium on Visualization
EG	Conference of the European Association for Computer Graphics
EGPGV	Eurographics Symposium on Parallel Graphics and Visualization
ICPR	International Conference on Pattern Recognition
INFOCOMP	International Conference on Information and Computing Science
ISC	International Supercomputing Conference
ISAV	In Situ Infrastructures for Enabling Extreme-Scale Analysis and Visualization
ISVC	International Symposium on Visual Computing
IV	International Conference on Information Visualisation
JDSSV	Journal of Data Science, Statistics, and Visualization
LDAV	IEEE Symposium on Large Data Analysis and Visualization
PacificVis	IEEE Pacific Visualization Symposium
QiVC	International Conference on Quantification in Visual Computing
SA Asia Vis	SIGGRAPH Asia Visualization / Asia Visualization Workshop
SC	International Conference for High Performance Computing, Networking, Storage and Analysis
SC Asia	Supercomputing Asia Conference
SEAAA	EUROMICRO Conference on Software Engineering and Advanced Applications
SIBGRAPI	Conference on Graphics, Patterns and Images
VIS	IEEE Visualization Conference
VisAI	Workshop on Visualization for AI Explainability
VINCI	International Symposium on Visual Information Communication and Interaction
VMV	Vision, Modeling, and Visualization
WOIV	International Workshop on In Situ Visualization