

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)

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|------|--|------|---|
| 2023 | Best Paper , <i>EGPGV</i> [12] | 2019 | Winner , <i>VIS SciVis Contest</i> [27] |
| 2023 | Teacher of the Year 22/23 (CS) , Runner up | 2019 | Honorable Mention , <i>ISAV</i> [34] |
| 2022 | Best Paper , <i>EG (Education)</i> [17] | 2019 | Best Paper , <i>EuroVis (Short)</i> [32] |
| 2020 | Best Paper , <i>LDAV</i> [25] | 2018 | Best Paper , <i>IV</i> [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 Reseach 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. Çağrı**, *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 , <i>Duisburg-Essen</i> , co-examiner	2018-20	S. Scheller , <i>Stuttgart</i> , SFB 1313, unfinished
2020-24	A. Gupta , <i>Dresden (TU & Max Planck)</i>	2017-22	G. Tkachev , <i>Stuttgart</i> , SimTech, co-examiner
2021-25	A. Straub , <i>Stuttgart</i> , SFB 1313	2016-21	V. Bruder , <i>Stuttgart</i> , SFB TRR 161, co-examiner
2018-19,25	M. Heinemann , <i>Stuttgart</i> , SFB 1313	2014-18	O. Fernandes , <i>Stuttgart</i> , 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 , <i>VisNotes Co-Chair</i>
since 2023	EGPGV , Chair of Steering Committee	2021	PacificVis , <i>Poster Co-Chair</i>
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 , $\rightarrow A2 \& A2 \rightarrow B1$
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/aved.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/BIB62325.2024.10822238.
- [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. 106485, 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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/10.1109/NYSDS.2016.7747807).
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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