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 [11]*

2023 **Teacher of the Year 22/23 (CS), Runner up**

2022 **Best Paper**, *EG (Education track) [16]*

2020 **Best Paper**, *LDAV [24]*

2019 **Winner**, *VIS SciVis Contest [26]*

2019 **Honorable Mention**, *ISAV [33]*

2019 **Best Paper**, *EuroVis (Short) [31]*

2018 **Best Paper**, *IV [36]*

Funding / Principal Investigator (PI)

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, joint proposal writing with one partner from Stuttgart (1st: T. Ertl, € 268700, 2nd: G. Reina, € 285600, 3rd: G. Reina, € 326400 – final decision pending, individual project: "Excellent")*

2024 **Perception-action integration in brain-computer interfaces, robotic task planning, and adaptive visualization (FSE)**, *FSE Resarch Grant (€ 375000)*, 2 positions, with A. Sburlea and H. Kazai, based in part on NWO VIDI Science 2022 proposal "Cognitive Model-based Optimization of Visualization for Large Scientific Data", rejected after interview (rating: Very Good)

2019 **Machine Learning for Data-driven Visualization (SimTech)**, *DFG project within SimTech*, 4-year PhD student position

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, € 307100*

2017 **Model-based Visual Analysis of Large Spatio-Temporal Data**, *DFG project within SimTech*, 4-year PhD student position

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, 4-year PhD student position

2015 **Quantifying Visual Computing Systems**, *Co-Author*, project A02 in Transregional Collaborative Research Center 161 (Quantitative Methods for Visual Computing) funded by DFG, € 280200

2011 **MCSimVis: Many Core Simulation and Visualization**, *involvement in proposal for 4-year PhD student position*, 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, Defense: 21th January 2025
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
2020-24 **A. Gupta**, *Dresden (TU & Max Planck)*
2021-25 **A. Straub**, *Stuttgart*, SFB 1313
2018-19,25 **M. Heinemann**, *Stuttgart*, SFB 1313
2018-20 **S. Scheller**, *Stuttgart*, SFB 1313, unfinished
2017-22 **G. Tkachev**, *Stuttgart*, SimTech, co-examiner
2016-21 **V. Bruder**, *Stuttgart*, SFB TRR 161, co-examiner
2014-18 **O. Fernandes**, *Stuttgart*, unfinished

Service / Conference & Journal Organization

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

Service / Program Committee

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

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 & Societies

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 **Course**, *Algorithms and Data Structures in C*, BSc, 5 ECTS, Coordinator & Lecturer
from 21/22 **Course**, *Scientific Visualization*, MSc, 5 ECTS, Coordinator & Lecturer
from 21/22 **Course**, *Computer Graphics*, BSc, 5 ECTS, Second Evaluator
from 21/22 **Course**, *Advanced Computer Graphics*, MSc, 5 ECTS, Second Evaluator
20/21-23/24 **Course**, *Introduction to CS*, Tutor

Teaching / Courses in Stuttgart (Co-Lecturer)

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

Teaching / BSc & MSc Students (since 2021, 1st and 2nd supervisor role indicated where applicable)

RUG **MSc**, *E. Waterink (1st, 2022), J. Boonstra (1st, 2022), S. Rouzbahani (1st, 2022), H. Stegenga (2nd, 2021), A. Feltham (1st, 2023), D. Boerema (1st, 2024), S. Bruin (2nd, 2022), L. D. Grandis (1st, 2025), J. M. van Eijk (2nd, 2025)*

RUG **BSc**, *H. Stegenga (2nd, 2021), W. V. de la Houssaije [12], [16] (2nd, 2021), C. van Wezel [12], [16] (2nd, 2021), A. Thioux (1st, 2022), M. R. Westra (1st, 2022), P. J. Blok (2nd, 2022), R. Rosema (2nd, 2022), B. Yilmaz (2nd, 2022), J. R. van der Zwaag (2nd, 2022), L. van der Wal [2] (1st, 2023), T. Couperus (2nd, 2023), V. Gaya (2nd, 2023), T. de Vries (2nd, 2023), P. Blesinger [2] (1st, 2024), A. Georgiadou (2nd, 2024), I. Bodola (2nd, 2024), A. Aaen (2nd, 2024), C. Panagioutou (1st, 2025), C. N. Iacob (1st, 2025), J. Trooster (1st, 2025), P.-T. Mocanu (2nd, 2025), B. W. Robertson (2nd, 2025), A. van Smoorenburg (2nd, 2025)*

RUG **MSc (Intern)**, *E. Waterink [22] (1st, 2021), A. Bredenbals (2nd, 2022), J. de Baat (1st, 2023), M. R. Westra (1st, 2023), S. J. Hilhorst (1st, 2023), L. Manuel (1st, 2024), T. Couperus (2nd, 2024), L. v. d. Wal (1st, 2025)*

RUG **Honors College**, *A. Dibajeh (1st, 2022), E. Landsaat (1st, 2022), S. J. van Schagen (1st, 2022)*

Stuttgart **MSc**, *A. Zeyfang (2021), M. Kleber (2025), N. Hauf (2025)*

Invitations / Presentations

2024 **DEEA**, *Visualization of Large Spatio-Temporal Data Collections*
2024 **RUG Applied AI Symposium**, *Machine Learning for Large Data Visualization*
2024 **RUG Comp Num Mat Seminar**, *Methods and Design Approaches for Fluid Dynamics Visualization*
2023 **TU/e (Eindhoven) Visualization Seminar**, *Scientific Visualization from an Optimization Perspective*
2022 **BigVis**, *Visual Mapping, Comparison and Exploration of Large Multifield Data*
2021 **Pretty Porous Lecture Series (SFB 1313)**, *Visualization of Multifield Data — Layouts, Features, and Systems*
2017 **NVIDIA GTC**, *Fast Flow-based Distance Quantification and Interpolation for High-Resolution Density Distributions*

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

2015 **ISC (Workshop)**, *Reduced Representations for In-Situ Visualization*

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

2013 **ParCo (Workshop)**, *Parallel Interactive Visualization: Strategies and Examples*

2009 **NVIDIA GTC**, *Memory Saving Fourier Transform on GPUs*

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*

2023 **University Teaching Qualification (UTQ)**

2023 **Coaching PhD students**

2021 **Dutch Language**, *→A2 & A2→B1*

2021 **How to select PhD students**

2021 **ERC Starting and Consolidator**

Outreach

2024 **Periodiek**, *Article*, Tursun, C., Frey, S., Kosinka, J., "On Foveated Rendering," Periodiek, no. 1, 2024

2024 **Zpannend Zernike**, *Interactive Demonstration*, Presentation of Virtual Volume Raycaster (VVRT)

2024 **European Researchers' Night**, *Interactive Demonstration*, Virtual Ray Tracer in VR

2023 **European Researchers' Night**, *Interactive Demonstration*, Virtual Ray Tracer (VRT)

2022,23 **Zpannend Zernike**, *Interactive Demonstration*, Virtual Ray Tracer (VRT)

2022 **Zpannend Zernike**, *Interactive Demonstration*, Webtool for heat data visualization

2020 **"Pretty Porous–Alles Porös" Science Exhibition**, *Interactive Demonstrator*, Integrated porous media simulation and visualization at Planetarium Stuttgart from 18th June to 30th August

List of Publications (peer-reviewed; given corresponding talks at conferences as indicated)

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

[8] 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.

[9] 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.

[10] 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.

[11] 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.

[12] 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.

[13] 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 at IEEE VIS 2023, DOI: 10.1109/TVCG.2022.3169590.

[14] 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.

[15] 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.

[16] 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.

[17] **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 at EuroVis 2022, DOI: 10.1111/cgf.14537.

[18] **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.

[19] 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.

[20] 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.

[21] 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.

[22] 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.

[23] **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.

[24] 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.

[25] 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.

[26] 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.

[27] 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.

[28] 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.

[29] 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.

[30] 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.

[31] 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.

[32] 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.

[33] 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.

[34] 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.

[35] 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.

[36] 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.

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

[38] 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.

[39] 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.

[40] 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.

[41] 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.

[42] 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.

[43] **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.

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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