Curriculum Vitae

Personal Information

Name	Prof. Dr. **Jürgen Bernard**
Address	Seestrasse 152, 8700 Küsnacht, Switzerland
Born	January 21, 1981, Lohr (Bavaria), Germany
Nationality	German (Citizenship in Switzerland)
Family	Wife: Carina Children: Maximilian (6), Marie (3)
Position	Assistant Professor, Group Head
Affiliation	University of Zurich, Department of Informatics Digital Society Initiative Interactive Visual Data Analysis Group
Contact	ph: +41-79-3098079 email: mail@juergen-bernard.de web: juergen-bernard.de orcid: 0000-0001-8741-9709

Main Research Focus

Visual Analytics, Information Visualization, Human-Centered Artificial Intelligence, Interactive Machine Learning, Data Science, Explainable Artificial Intelligence, Visual Computing.

Education

2019	**Zertifikat Hochschullehre** Deutsche Gesellschaft für Hochschuldidaktik, Germany Higher Education Teaching Certificate, 3 years with modules
2015	**Ph.D. in Computer Science** TU Darmstadt / Fraunhofer Institut für Grpahische Datenverarbeitung (IGD), Germany Dissertation: Exploratory Search in Time-Oriented Primary Data *Grade: 1 – summa cum laude*
2009	**Diplom (MSc) in Computer Science** TU Darmstadt, Germany *Grade: 1 – sehr gut*
2000	**Abitur/Matura** (German High School Degree) Franz-Ludwig von Erthal Gymnasium, Lohr am Main, Bavaria, Germany

Jürgen Bernard
Curriculum Vitae

Work Experience

09/2020–*present*	**Assistant Professor (non-tenure)** University of Zurich (UZH), Computer Science, Zurich, Switzerland Focus: Interacting with Data, Human-Centered AI
09/2020–*present*	**Group Leader** Interactive Visual Data Analysis (IVDA) Group, at UZH
09/2020–*present*	**DSI Professor** Digital Society Initiative (DSI), University of Zurich Focus: Digital Transformation, Human-Centered AI
06/2019–12/2020	**Postdoctoral Research Fellow** University of British Columbia (UBC), Department of Computer Science (with Prof. Dr. Tamara Munzner), Vancouver, Canada Focus: Interactive Machine Learning, Design Studies, Health Data Analytics
02/2016–05/2019	**Postdoctoral Research Fellow** Interactive Graphics Systems Group (GRIS), TU Darmstadt, Germany Lead: Visual-Interactive Machine Learning group
01/2016–12/2017	**Self-Employed Data Scientist** Design and Development of Visual Analytics Solutions, Darmstadt, Germany
01/2012–01/2016	**Researcher (Ph.D. Student)** Fraunhofer Institute for Computer Graphics Research IGD, Germany Focus: Exploratory Search, Time Series Analysis, User-centered Design
01/2010–12/2011	**Ph.D. Student** TU Darmstadt, Germany
01/2007–12/2009	**Research Student** TU Darmstadt, Germany
07/2002–10/2008	**Working Student, Software Engineer** (10 weeks/year) Bosch AG, Lohr am Main, Germany
05/2001–12/2005	**Self-Employed, Startup** Web Hosting Service, Darmstadt, Germany
09/2000–06/2001	**Civilian Service (Male Nurse)** Geriatric Nursing Center in Lohr am Main, Germany
03/1999–07/2007	**Self-Employed, Startup** Vinyl Record Store, Lohr am Main, Germany
07/1998–09/2001	**Working Student** (5 weeks/year) Mannesmann Rexroth AG, Lohr am Main, Germany

Professional Services, Academic Engagement

Memberships	*Faculty member* of the Digital Society Initiative (DSI), Zürich (since 2020)
	ACM member (since 2021)
	IEEE member (since 2013)
	EG member (2017-2019, since 2022)
	EG Junior Fellow (since 2022)
	DHV member (since 2018)
	GI member (since 2020)
	GI-VIS member (since 2021)
Organization	*1* × *General Chair* of **VAHC** (IEEE VIS): Workshop on Visual Analytics in Health Care (2023)
	3 × *Steering Committee* of **EuroVA** (Eurographics, EG): Workshop on Visual Analytics (2023, 2024, 2025)
	4 × *Steering Committee* of **VAHC** (IEEE/ACM VIS): Workshop on Visual Analytics in Health Care (2021, 2023, 2024, 2025)
	1 × *Organizing Committee* of **VIS** IEEE: Conference on Visualization, Supporters Chair (2022)
	1 × *Organizing Committee* of **BELIV** (IEEE/ACM VIS): Workshop on evaluation and BEyond - methodoLogIcal approaches for Visualization (2024)
	4 × *Organizing Committee* of **VAHC** (IEEE/ACM VIS): Workshop on Visual Analytics in Health Care, Organizer (2015, 2017, 2019, 2021)
	2 × *Organizing Committee* of **EuroVA** (Eurographics, EG): Workshop on Visual Analytics, Organizer (2021, 2022)
	4 × *Organizing Committee* of **EuroVis** (Eurographics, EG): Conference on Visualization, Co-located Workshops Chair (2021, 2022, 2023, 2024)
Editor	*2* × *Guest-Editor* in the Computers and Graphics Journal **C&G**, Special Issue of EuroVA (2021, 2022)
	1 × *Guest-Editor* in the Journal of the American Medical Informatics Association **JAMIA**, Special Issue of VAHC (2024)
Committees	*50* × *Program Committee* *Main conferences:* **IEEE VIS** Visualization & Visual Analytics (2022, 2023, 2024), **IEEE VAST** Visual Analytics Science and Technology (2018, 2019, 2020), **EG EuroVis** Conference on Visualization (2021, 2022, 2023), **EG EuroVis** Conference on Visualization, State-Of-The-Art Reports (2024, 2025),

VMV EG Symposium on Vision, Modeling, and Visualization (2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025), **IVAPP** EG Conference on Information Visualization Theory and Applications (2017, 2018), **IEEE VIS** Conference on Advances in Visualization and Visual Analytics, Short Papers (2020, 2021, 2025), **EG EuroVis** Conference on Visualization, Short Papers (2017, 2018, 2019, 2020).
Other conferences, symposia, and workshops: **SAC** ACM Symposium on Applied Computing, Applications and Systems for Healthcare (ASH) track (2026), **UCEX-XAI** User-Centered Explanations in XAI Workshop (2025), **EuroVA** EG EuroVis Workshop on Visual Analytics (2023, 2025), **VAHC** IEEE VIS Workshop on Visual Analytics in Health Care (2015, 2017, 2019, 2021, 2025), **BELIV** IEEE VIS Workshop on Evaluation and Beyond - Methodological Approaches for Vis (2018, 2020, 2022, 2024), **VCBM** EG Symposium on Visual Computing for Biology and Medicine (2024, 2025), **VDS** ACM KDD/IEEE VIS Visualization in Data Science (VDS) (2022), **VISxAI** IEEE VIS Workshop on Visualization for AI Explainability (2018, 2019, 2021), **Vis4PandEmRes** IEEE VIS Workshop on Visualization for Pandemic and Emergency Responses (2023), **BigVIS** EDBT/ICDT Workshop on Big Data Visual Exploration and Analytics (2023), **TIME** LIPIcs International Symposium on Temporal Representation and Reasoning (2021).

Peer Reviewing

Overall, *20+ reviews per year*

Grant proposals: DFG (Germany), FWF (Austria), DSI Bridge Postdoc Call (Switzerland), DSI Ph.D. Excellence Program (Switzerland)

Visualization area: IEEE TVCG Journal, EG CGF Journal, EG CGF Journal (S.T.A.R), Elsevier C&G Journal, ACM TOG Journal, SAGE IV Journal, Springer TVC, IEEE VIS, IEEE VIS (short), IEEE InfoVis, IEEE InfoVis (short), IEEE VAST, EG EuroVis, EG EuroVis (short) EG EuroVis (S.T.A.R), EG EuroVis (short), EG VMV, IEEE PacificVis, IEEE/ACM VAHC, IEEE VIS BELIV, IEEE VIS VISxAI, IEEE VIS VISReg, IEEE VIS VDS, EG VCBM, EG VCBM (short), EG IVAPP, PG Pacific Graphics, EG PG&V

Other areas: ACM TiiS Journal, ACM CHI Conference, IEEE Access Journal, ACM JDIQ Journal of Data and Information Quality, MDPI Algorithms Journal, ACM Multimedia Journal, Neurocomputing Journal, Springer IJoDL Journal, LIPIs TIME, Taylor & Francis IJHCI Journal, Wiley Information Systems INFOSYS Journal, JOCSCI Journal of Computational Science

Awarding

IEEE VIS Short Best Paper 2025 Jury Member

EG Dirk Bartz Price 2023 Jury Member

EG VMW 2023 Best Paper, with Anita Sellent and Marc Stamminger

Awards

Personal

EuroGraphics Young Researcher Award
at EuroGraphics (EG), Reims, FR, 2022.

EuroVis Young Researcher Award
EuroVis (EG), Zurich, CH, 2021.

Dirk Bartz Prize Visual Computing in Medicine
at Eurographics (EG), Lyon, France, 2017

Hugo-Geiger Prize Excellent Dissertations
by Fraunhofer Gesellschaft, München, Germany, 2016

GI Prize for Excellent Dissertations Nominee by Gesellschaft für Informatik (GI), Dagstuhl, Germany, 2016

Best Diploma Thesis Award by Fraunhofer IGD, TU Darmstadt, Darmstadt, Germany, 2010

Papers

Best Paper Award: A Design Space for the Critical Validation of LLM-Generated Tabular Data
at EuroVA, Luxembourg, CH, 2025.

Best Paper Award: IRVINE – A Design Study on Analyzing Correlation Patterns of Electrical Engines
at IEEE VIS, New Orleans, USA, 2021.

Best Paper Award: LFPeers: Temporal Similarity Search in Covid-19 Data
at EuroVA, Zurich, CH, 2021.

Learning and Teaching in Co-Adaptive Guidance for Mixed-Initiative Visual Analytics
at EuroVA, Norrköping, SWE, 2020.

Honorable Mention for Best Paper: Visual Analysis of Degree-of-Interest Functions to Support Selection Strategies for Instance Labeling
at EuroVA, Porto, POR, 2019.

Honorable Mention for Best Paper: Personalized Visual-Interactive Music Classification
at EuroVA, Brno, CZR, 2018.

Best Paper Award: Visual-Interactive Similarity Search for Complex Objects by Example of Soccer Player Analysis
at IVAPP/VISGRAPP, Porto, POR, 2017.

Honorable Mention for Best Paper: Visual-Interactive Segmentation of Multivariate Time Series
at EuroVA, Groningen, NED, 2016.

Best Paper Award: Visual Access to an Agent-based Simulation Model to Support Political Decision Making
at i-KNOW, Graz, AUT, 2014.

Best Paper Award: Content-based layouts for exploratory metadata search in scientific research data
at JCDL, Washington, USA, 2012.

Contribution

Replicability Stamp Award
for a TVCG Journal Article with a complete open-source implementation

4th most-contributing Author of EuroVA all Time
at the 10th Anniv. of EuroVA 2019 – for 8 Publications (2010–2019)

2 × Best Industrial Project Award (2014, 2016)
Fraunhofer IGD, Darmstadt, GER.
for outstanding application-driven research in industry projects.

2 × Best Paper Award (2010, 2016)
Fraunhofer IGD, Darmstadt, GER.
for outstanding applied research papers published in the last year.

3 × Honorable Mention for Best Paper Award (2011, 2014, 2019)
Fraunhofer IGD, Darmstadt, GER.
for outstanding applied research papers published in the last year.

Teaching

SDG Impact Award Nomination – Bachelor Thesis of Paul Ferdinand Safari (Superv.)
at the University of Zurich, Zurich, CH, 2025

SDG Impact Award Nomination – Master Thesis of Euxane Célia Marie Vaz Pinto (Superv.)
at University of Zurich, Zurich, CH, 2025

UZH Semester Award – Bachelor Thesis of Paul Ferdinand Safari (Superv.)
at the University of Zurich, Zurich, CH, 2024

SDG Impact Award Nomination – Master Thesis of Yves Rutishauser (Superv.)
at the University of Zurich, Zurich, CH, 2023

Datenlotsen Price – Best Student Thesis of Christian Ritter (Superv.)
at TU Darmstadt, GER, 2018

Participation

Awarded for the Heidelberg Laureate Forum (HLT)
Heidelberg Laureate Forum, Heidelberg, GER, 2017

Awarded for the Global Young Researchers Summit (GYSS)
Global Young Researchers Summit, Singapore, 2016

Funding

Univ. of Zurich

Third-party funds acquired at UZH: **2,589,228 CHF**, acquired matching funds: **446,800 CHF**, own budget: **2,621,950 CHF**.

Principal Investigator in **ORD-Xplore 2.0**: An interactive exploration infrastructure for digital scholarly editions. swissuniversities, Switzerland, 01/2026–12/2026 180,000+180,000 CHF)

Principal Investigator in **SDG Research Scout Extension**: AI-Supported Sustainability Scoring. UZH Leaderboard, Switzerland, 08/2025–12/2025 (50,000 CHF)

Ph.D. Student Grant in **LLM-VAL**: A Framework for the Critical Validation of LLM-Generated Structured Data (Madhav Sachdeva). UZH CanDoc Grant, Switzerland, 08/2025–07/2026 (61,661 CHF)

Principal Investigator in **Personalized VA**: Human Preference Elicitation for Ranking-Based Multi-Criteria Decision Support. Swiss National Funds (SNF) Project Grant, Switzerland, 05/2025–04/2029 (1,199,878 CHF)

Principal Investigator in **ORD-Xplore 2.0**: Bridging 60 Digital Scholary Editions. UZH Leaderboard, Switzerland, 10/2024–12/2025 (60,000 CHF)

Principal Investigator in **STAG**: Statistical Time Series Analysis Guide. UZH Digital Society Initiative, Switzerland, 09/2024–02/2026 (100,000 CHF)

Associated Partner in **SOLIDERA**: SOLIdifying Digital REseaRch Approaches in health sciences. UZH Global Strategy, 01/2025–12/2025 (5,000 CHF)

Principal Investigator in **WISE**: Web-based interdisciplinary symptom evaluation. Innosuisse Innoscheck, Switzerland, 11/2023–05/2024 (15,000 CHF)

Fully-funded Ph.D. Student Grant in **IVDA-DH**: Visual Analytics in the Digital Humanities. Digital Society Initiative (DSI), Switzerland, 08/2024–07/2028 (207,368 CHF). Michael Blum started 01/2024

Principal Investigator in **Tag-Xplore**: Assessment of Tag Usage in Heterogeneous Digital Editions. swissuniversities, Switzerland, 01/2024–12/2024 (50,000+50,000 CHF)

Principal Investigator in **SDG Scout**: Sustainability Research Scout.
UZH Digital Society Initiative, Switzerland, 09/2023–02/2025 (100,000 CHF)

Principal Investigator in **BruxIT**: Human-Centered Bruxism Sensor Data Analytics. Prof. Dominik Ettlin, Switzerland, 01/2023–06/2023 (25,000 CHF)

Fully-funded Ph.D. Student Grant in **HMT-HC**: Human-Model Teaming.
Digital Society Initiative (DSI), Switzerland, 08/2023–07/2027 (202,508 CHF).
Gabriela Morgenshtern started 09/2023

Fully-funded Ph.D. Student Grant in **PHCT1D**: Personalized Healthcare. Digital Society Initiative (DSI), Switzerland, 08/2023–07/2027 (202,508 CHF). Clara-Maria Barth started 09/2023

Principal Investigator in **ORD-Xplore**: Finding Commonalities Across Heterogeneous ORD Collections. swissuniversities, Switzerland, 01/2023–06/2024 (75,000+75,000 CHF)

Principal Investigator in **Roche**: Interactive Particle Root Cause Analysis. Roche AG, Rotkreuz, Switzerland, 11/2022–12/2023 (10,000 CHF)

Associated Partner in **ReWoSo**: Data Visualization for HCPs and Patients. DataBooster for Rewoso AG, Switzerland, 01/2023–03/2023 (10,000 CHF)

Principal Investigator in **IVIE-Docs**: Interactive Clustering and Labeling of Heterogeneous Text Document Collections.
Acodis AG, Winterthur, Switzerland, 03/2022–11/2022 (5,000 CHF)

Principal Investigator in **IAS**: Interaktive Analyse von Sensordaten.
BMW AG, München, Germany, 07/2021–12/2022 (94,600 €)

Participating Researcher in **DSI-Libraries**: Expl. of Open Research Data. Digital Society Initiative (DSI), Switzerland, 01/2023–12/2023 (10,000 CHF)

Participating Researcher in **DSI-Health**: Creating an application for remote monitoring of patient/athlete activity through collaborative design.
Digital Society Initiative (DSI), Switzerland, 01/2023–12/2023 (10,000 CHF)

Fully-funded Ph.D. Student Grant in **xAI4R**: xAI for Item Rankings. Digital Society Initiative (DSI), Switzerland, 09/2022–08/2026 (202,096 CHF). Ibrahim al Hazwani started 09/2022

UBC Vancouver

Awarded Scholarship by **DSI**: Post-doctoral Matching Fund Application. Data Science Initiative, University of British Columbia (UBC), Canada. with Prof. Tamara Munzner(UBC), 07/2020–06/2021 (40,000 CAD)

TU Darmstadt

Awarded Scholarship by **DAAD**: German Post-Doctoral Exchange (Canada). Deutscher Akademischer Austauschdienst, Bonn, Germany.
with Prof. Tamara Munzner(UBC), 08/2019–12/2019 (19,800 €)

Awarded Exchange Program by **TU Graz & TU Darmstadt**: Collaborative Exchange of Excellence, between TU Graz and TU Darmstadt (to Austria). with Prof. Tobias Schreck (TU Graz), 06/2018–09/2018 (10,000 €)

Participating Researcher in **VISSECT**: Visual-Interactive Segmentation and Labeling of Multivariate Time Series. Project No. I 2850. Deutsche Forschungsgemeinschaft, Germany, 2016–2019 (742,000 €)

Participating Researcher in **Progether**: Your Prostate Cancer Network. Patient-centered Health Platform. Industry project funded by Progether, Oslo, Norway, 2015–2016 (30,000 €)

Participating Researcher in **UKE-II**: Visual-Interactive Stratification of Patient Cohorts. Industrial research project funded by Universitätsklinikum Hamburg Eppendorf (UKE), Germany, 2015–2016 (30,000 €)

Participating Researcher in **UKE**: Visual-Interactive Analysis of Cancer Patient Histories. Industrial research project funded by funded by Universitätsklinikum Hamburg Eppendorf (UKE), Germany, 2013–2014 (30,000 €)

Participating Researcher in **BT**: Telecommunication Network and Big Data Analysis. Industrial research project funded by British Telecom (BT), Ipswich, United Kingdom, 2013–2015 (30,000 €)

Participating Researcher in **VisInfo**: Visual Access to Research Data. Funded by Leibnitz Gemeinschaft/Leibniz Foundation (WGL), Germany, 2010–2012 (600,000 €)

Invited Speaker Talks (no paper presentations)

2025	**Human Knowledge and Preference Externalization for Interactive Visual Data Analytics** Keynote at the VizTIG Symposium, University of Leeds, UK
2025	**Datenanalyse und Visualisierung** Alumni Event der Wirtschaftswissenschaftlichen Fakultät, UZH, Zurich, CH
2025	**Decision-Making in the Age of AI: The Role of Interactive Visual Data Analytics** SIRA Brown Bag Talk, Swiss Informatics Research Association, CH
2025	**Human Knowledge and Preference Externalization for Personalized Visual Analytics** SFB TR 161, University of Stuttgart, GER
2024	**Visual Analytics: Mensch und Maschine im Dialog mit Daten und: Mein Weg danach** Computer Graphic Night CGN, Fraunhofer IGD, Darmstadt, GER
2024	**Generative AI - Designing Interactive AI Systems** CAS Certificate of Advanced Studies, Zurich, CH
2024	**Visualization - Datenmanagement und Informationstechnologien** CAS Certificate of Advanced Studies, Zurich, CH
2024	**Interactive Data Visualization with AI** Lecture Series on Ethical and Reflective Prompt Engineering, Zurich, CH
2023	**Visual Analytics in Healthcare** Monash University, Melbourne, AUS
2023	**Interactive Visual Data Analysis** Digital Society Initiative (DSI), Zurich, CH
2023	**Solving Data Science Challenges with IVDA** IfI Alumni Talk, Zurich, CH
2022	**Data Analysis - Challenges and Opportunities for IVDA** Robotics and Perception Group, Zurich, CH
2022	**Human-Centered Data Analysis in Finance** Forschungsgruppe Financial Economics, Zurich, CH
2022	**Interaktion und Raum: DSI-Perspektiven** Kolloquium des UFSP Sprache und Raum, Zurich, CH
2022	**Interacting with Data** University of Zurich (UZH), Inaugural Lecture, Zurich, CH

2021	**Problem-Driven and Human-Centered Visual Analytics** University of Rostock, GER
2021	**Interactive Data Science with the Human-in-the-Loop** BMW, Munich, GER
2020	**Interactive Visual Data Analysis** University of Zurich, CH
2019	**Enhancing Interactive Machine Learning** Johannes Kepler University Linz, AUT
2019	**Enhancing Human Centered and Interactive Machine Learning** Aarhus University, Denmark
2019	**Enhancing Human-Centered Machine Learning with VA** Visual Computing Forum, University of Bergen, Norway
2019	**Enhancing Interactive Data Science with Visual Analytics** University of Rostock, GER
2019	**Visual-Interactive Data Science** University of Zurich, CH
2018	**Transparent Machine Learning with Visual Analytics** VIS in Practice, IEEE VIS, Berlin, GER
2018	**Visual-Interactive Machine Learning** TU Graz, AUT
2018	**Visual-Interactive Data Science** City, University of London, UK
2018	**Visual-Interactive Machine Learning** University of Konstanz, GER
2018	**Interactive Visual Data Science – Solutions to Data Labeling** University of Trier, GER
2018	**Data Visualization and Visual Analytics** Graduate School Computational Engineering (CE), TU Darmstadt, GER
2018	**Machine Learning with the User-in-the-Loop** VRVis, Center for Virtual Reality and Visualization, Vienna, AUT
2018	**Visual-Interactive Machine Learning for Time-Oriented Data** University of Konstanz, GER
2017	**Visual Analytics of Clinical Healthcare Data for Prostate Cancer** IEEE VIS, Tutorial, Phoenix, AZ, USA
2017	**Data Quality, a Remaining Challenge** IEEE VIS, Tutorial Phoenix, AZ, USA

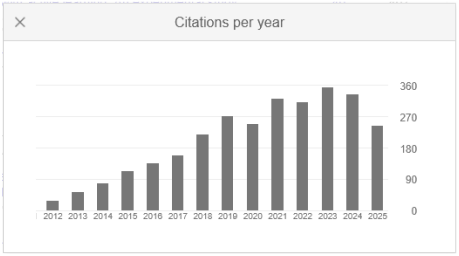
2017	**Visual Computing for Big Data Analysis in Prostate Cancer** Dirk Bartz Price Talk, Eurographics, Lyon, France
2017	**Exploratory Search in Time-Oriented Data** Vienna University of Technology, AUT
2017	**Visual Analytics meets Machine Learning** St. Poelten University of Applied Sciences, AUT
2016	**Visual Analytics meets Human Motion Analysis** University of Bonn, GER
2016	**Explorative Suche in Zeitbasierten Primärdaten** Gesellschaft für Informatik (GI), Dagstuhl, GER
2015	**Exploratory Search in Time-Oriented Primary Data** Ph.D. Defense, University of Darmstadt, GER
2015	**Relation Seeking between Time Series Data and Multivariate Data** Artificial Intelligence (AI), Cambridge, United Kingdom
2013	**Visual Analysis of Time-oriented Data** British Telecom, Ipswich, United Kingdom
2013	**Visual Analysis of Time-oriented Data** Artificial Intelligence (AI), Cambridge, United Kingdom
2012	**Content-based vs. Metadata-based Search and Analysis** Research Worksop, University of Konstanz, GER
2011	**Visual Access to Time-Oriented Scientific Primary Data** Deutsches Klimarechenzentrum (DKRZ), Hamburg, GER
2010	**Visualization and Search Approaches for Time-Oriented Scientific Primary Data** DataCite Workshop, Hannover, GER

Publications and Research Network

Publication Statistics

Journal	**39** peer-reviewed journal articles
Conference	**28** peer-reviewed conference papers
Workshop	**40** peer-reviewed workshop papers
Short Papers	**9** peer-reviewed short papers
Posters	**13** peer-reviewed short papers
# citations	**2936** overall, **1814** since 2020*
h-index	**28** overall, **22** since 2020*
i10-index	**59** overall, **41** since 2020*

* based on Google Scholar (September 18, 2025)



Trend of the citations by year.

Most Important Publications

Detailed information on publications representative can be found at my Website.

[J25] IRVINE: A design study on analyzing correlation patterns of electrical engines
Eirich, J., Bonart, J., Jäckle, D., Sedlmair, M., Schmid, U., Fischbach, K., Schreck, T., **Bernard, J.** *IEEE Transactions on Visualization and Computer Graphics (TCVG)* pp. 11-21, (2022). doi: 10.1109/TVCG.2021.3114797 Best Paper Award at IEEE VIS 2021. 46 citations*

This TVCG journal article is the extended journal version of our best paper at IEEE VIS 2021, the leading venue for advances in visualization and visual analytics. IRVINE is an interactive visual data labeling system that combines clustering with manual selection, enabling users to assign error labels and annotations to individual engines or clusters based on acoustic patterns. IRVINE allows domain experts in manufacturing to detect and annotate unknown errors in acoustic data over 30% faster, improving quality assurance in serial production and reducing material waste. IRVINE is also a key example of my research on human knowledge externalization: enabling experts to inject contextual knowledge into analytics workflows, thereby improving organizational knowledge bases (as done at BMW), enhancing machine learning models for error detection, and supporting sustainable industrial processes.

[J11] Comparing Visual-Interactive Labeling with Active Learning: An Experimental Study
Bernard, J., Hutter, M., Zeppelzauer, M., Fellner, D., Sedlmair, M. *IEEE Transactions on Visualization and Computer Graphics (TCVG)* pp. 298-308, (2018). doi: 10.1109/TVCG.2017.2744818 201 citations*

This TVCG Journal article is a pioneering work for interactive data labeling, as an extension to classical active learning. The results of the experimental study based on four techniques for interactive data labeling opened the way for data labeling approaches in the visualization community. The work was one important milestone for me and my collaborators (M. Sedlmair,

M. Zeppelzauer) to propose the VIAL (Visual-Interactive Labeling) Methodology, that still is a reference model for data labeling approaches in interactive machine learning contexts. The work likewise represents the new research directions I approached during my PostDoc and Assistant Prof. career.

[J12] VIAL: a unified process for visual interactive labeling
Bernard, J., Zeppelzauer, M., Sedlmair, M., Aigner, W. *The Visual Computer (TVCJ)* pp. 1189-1207, (2018). doi: 10.1007/s00371-018-1500-3 130 citations*

This TVCJ Journal article proposes VIAL methodology for interactive data labeling, which in my community is deeply connected to my name. Together with my collaborators (M. Sedlmair, M. Zeppelzauer, and W. Aigner), we characterize human-machine collaboration for data labeling challenges in six steps, forming an iteration of the incremental data labeling process, in the realm of human-centered, interactive machine learning. The work gained wide attention in the community and still is the reference model for interactive data labeling approaches with human-in-the-loop integration. The work constitutes one of my milestones in my PostDoc and Assistant Prof. career, with research streams beyond my PhD topics.

[J04] MotionExplorer: Exploratory Search in Human Motion Capture Data
Bernard, J., Wilhelm, N., Krüger, B., May, T., Schreck, T., Kohlhammer, J. *IEEE Transactions on Visualization and Computer Graphics (TVCG)* pp. 2257-2266, (2013). doi: 10.1109/TVCG.2013.178. 127 citations*

Motion Explorer is one of my first collaborative and interdisciplinary design studies, my first interactive data analysis system for the search and exploration of human motion capture data, and one of my primary use cases used in my Ph.D. Thesis. Also, Motion Explorer is my first publication in the TVCG Journal, the top reference for Visualization researchers. The presented multiple-linked views system includes sophisticated unsupervised machine learning methods and a rich interaction portfolio, enabling both the exploration of and search in human motion capture data. In this way, users can discover large motion capture databases and retrieve motion sequences effectively, for character animation, professional sports, and rehabilitation alike.

[J01] Visual Cluster Analysis of Trajectory Data with Interactive Kohonen Maps
Schreck, T., **Bernard, J.**, von Landesberger, T., Kohlhammer, J. *Information Visualization, Palgrave Macmillan* pp. 14-29, (2009). doi: 10.1057/ivs.2008.29. 254 citations*

This paper presents the core intellectual contributions of my Master's thesis, which my advisors identified as suitable for publication in a Class A journal. It introduces a pioneering approach for transparent and interpretable clustering, based on the Self-Organizing Maps (SOM) neural network algorithm. The proposed method integrates white-box principles across the full learning pipeline of unsupervised machine learning. It supports user-defined network initialization, interactive parameter configuration, visual inspection of training dynamics, the interactive definition of fixpoint nodes during training, quality monitoring, result interpretation, and iterative refinement. This work represents one of the first transparent and interpretable machine learning techniques, preceding the rise of explainable AI and deep learning as major research areas.

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* based on Google Scholar (September 18, 2025)

Co-Authors (selection)

Professors	Kohlhammer, J. | Schreck, T. | Sedlmair, M. | Munzner, T. | Shneiderman, B. | El-Assady, M. | Keim, D. | Miksch, S. | Streit, M. | Schumann, H. | Aigner, W. | Fellner, D. | Ruddle, R. | Gotz, D. | Zeppelzauer, M. | von Wyl, V. | Andrews, K. | Sourin, A. | Behrisch, M. | Schlomm, T. | Sens, I. | Krüger, B. | Preim, B. | Arleo, A. | Klein, R. | Kuijper, A. | Nazemi, K. | Beck, F. | Kerren, A. | Kotthoff, L. | Turkay, C. | Wall, E. | Spott, M. | Licka, T. | Schmid, U. | Fischbach, K. | Huang, E. | Chevalier, F. | Turkay, C. | Wall, E. | Volk, M. | Mumenthaler, R. | Schneider, G. | von Landesberger, T. (Tekusova) Goldenberg, A. | Bremm, S. | Loeb, S. | Bustos, B. | Graefen, M. | Huland, H. | Ricci, F.
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BSc, MSc	Hutter, M. | Sessler, D. | Schmid, J. | Sachdeva, M. | Peiris, Y. | Barth, C. | Al-Hazwani, I. | Beckmann, R. | Cuba, E. | Meier, A. | Blum, M. | Morgenshtern, G. | Rutishauser, Y. | Blaga, C. | Wyss, A. | Ahmed, N. | Alahmadi, T. | Ritter, C. | Bannach, A. | Ulmer, A. | Reinemuth, H. | Pfeifer, H. | Lehmann, M. | Müller, M. | Kraus, M. | Lücke-Tieke, H. | Wilhelm, N. | Dobermann, E. | Staab, M. | Thum, S. | Retz, R. | Goroll, O. | Burmeister, J. | Schader, P. | Eichner, C. | Jeitler, A. | Bonart, J. | Grossmann, N. | Graner, L. | Wang, Y. | Wehner, C. | Arnorsson, S. | Wardatzky, K. | Verma, A. | Luo, T.

Teaching Experience

Courses

Univ. of Zurich

4 × Interactive Visual Data Analysis (Lecture 6ECTS in 2022-2024, 3ECTS in 2021 fall term), main organizer, MSc-level (approx. 100 students p.t.)

4 × Interactive Data Science in Digital Health (Seminar, 3ECTS, 2022-2025, spring term), main organizer together with Prof. Viktor von Wyl (interdisciplinary), teacher, and supervisor, MSc/Ph.D.-level (24 students per term)

5 × Interactive Visual Data Analysis (Seminar, 3ECTS, 2021-2025, spring term), main organizer, teacher, and supervisor, BSc/MSc-level (24 students)

2 × Visual Analytics (Seminar, 3ECTS, 2023-2024, fall term), main organizer, MSc/BSc (24 students per term)

5 × DSI Minor on Digital Skills, (Lecture Unit, 3ECTS, 2021-2025), guest professor lecturer, MSc-level

3 × Fundamentals of People-Oriented Computing (Lecture, 6ECTS, 2021-2023, fall term), co-teacher, supervisor, MSc-level (approx. 10 students p.t.)

1 × Creating Evidence in Digital and Mobile Health (Seminar, 3ECTS, 2021, spring term), main organizer together with Prof. Viktor von Wyl (interdisciplinary), teacher, and supervisor, MSc/Ph.D.-level (24 students per term)

1 × Masters Basismodul, (Lab Course, 6ECTS, 2021), supervisor, MSc-level

regularly: Masters Project, (Lab Course, 15ECTS, 2020-2025, every term), supervisor, MSc-level practical lab course

regularly: Independent Study, (Lab Course, 3/6/9ECTS, 2020-2025), supervisor, MSc-level

TU Darmstadt

2 × User-Centered Design in Visual Computing (Lecture, 3ECTS, SS 2017, SS 2018), main organizer, MSc-level (approx. 100 students per term)

3 × Information Visualization and Visual Analytics (Exercise, 3ECTS, WS 2011/12, WS 2016/17, WS 2018/19), co-organizer and teacher, MSc-level (approx. 80 students per term)

16 × Visual Computing Lab (Lab Course, 6ECTS, WS2010/11–SS 2019, every term), supervisor, MSc-level practical lab course (27 students in total, 13 students with joint publication afterwards)

9 × Visual Analytics Seminar (Seminar, 3ECTS, SS2010–SS2018, summer term), supervisor, MSc-level, (ca. 10 students in total)

Certificate for Advanced Studies (CAS)

CAS GAI — in the CAS for Generative Artificial Intelligence, on "Designing Interactive AI Systems" (2024) (4 × 90min), University of Zurich, CH

CAS DMIT — in the CAS for Data Management and Information Technologies, on "Data Visualization" (2024-2025) (2 × 90min), University of Zurich, CH

CAS DS+ML — in the CAS for Data Science and Machine Learning, on "Visual Analytics and iML" (2022) (2 × 90min), University of Zurich, CH

Hands-on Student Supervision (★ publication(s), including student co-authorship)

PostDocs — Dr. Jana Sedlakova (ongoing) ★ Dr. Martin Ariel Lacayo-Emery

Ph.D. Level — Ibrahim al Hazwani (ongoing) ★, Gabriela Morgenshtern (ongoing) ★, Madhav Sachdeva (ongoing) ★, Clara-Maria Barth (ongoing) ★ Michael Blum (ongoing) ★ Aman Kumar (ongoing)

Research Assistants (with MSc Degree) — Gregor Bachmann Célia Marie Vaz Pinto (ongoing), Euxane Célia Marie Vaz Pinto, Eduard Čuba ★, Cristian-Ioan Blaga ★, Raphael Beckmann ★, Marco Hutter ★,

Stud. Theses — Jakob Schwarz (MSc), Sina Klerings (BSc), Katerina Kuneva (BSc), Krzysztof Wróblewski (MSc), Marvin Wiedenkeller (BSc) ★, Luca Huber (MSc), Nicolas Huber (MSc), Gian Gyger (BSc), Christopher Narayanan (BSc) ★, Yuqing Huang (MSc), Jonas Blum (BSc) ★, Eylül Gükce Harputluoglu (MSc), Xiaomeng Gu (MSc), Oliver Aschwanden (MSc), Yurong Chen (MSc), Eleonora Pura (MSc), Raphael Kummer (BSc), Euxane Célia Marie Vaz Pinto (MSc), Sukriti Sinha (MSc), Paul Ferdinand Safari (BSc), Peilin He (MSc), Tiantian Lou (MSc) ★, Larissa Senning (BSc), Alexander Wyss (MSc) ★, Nevio Liberato (BSc), Christian De Iaco (MSc), Michael Blum (MSc) ★, Turki Alahmadi (MSc) ★, Andrea Meier (MSc) ★, Maximilian Tornow (MSc), Yasara Peiris (MSc) ★, Simon Hurwitz (MSc), Raphael Beckmann (MSc) ★, Yves Rutishauser (MSc) ★, Jenny Schmid (MSc) ★, Markus Lehmann (MSc) ★, Heiko Reinemuth (MSc) ★, Maximilian Müller (MSc), Christian Ritter (BSc) ★, David Sessler (BSc) ★, Eduard Dobermann (MSc) ★, David Sessler (MSc) ★, Alex Ulmer (MSc) ★

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Professional Development: Higher Education Teaching Certificate

2019	**Teaching Portfolio and Reflection on Teaching** Written Report (99 pages, available on request), Darmstadt, Germany
2019	**Expert-Guided Teaching Project** Fraunhofer IGD and Campus Lichtwiese, Darmstadt, Germany
2018	**Reflection on Teaching Workshops and Transfer to own Teaching** Written Report
2018	**Teaching International Students** HDA Darmstadt, Germany
2018	**Visualization Techniques with Flip Charts** Ingenium (Young Researchers at TU Darmstadt) Darmstadt, Germany
2018	**Competence-Oriented Teaching** HDA Darmstadt, Germany
2018	**Motivating Students in Academia** HDA Darmstadt, Germany
2018	**Supervision of Student Theses** HDA Darmstadt, Germany
2018	**Guided Reflection on own Teaching Philosophy** HDA Darmstadt, Germany
2018	**Expert Evaluation of own Teaching Methods II** TU Darmstadt, Germany
2017	**Expert Evaluation of own Teaching Methods I** TU Darmstadt, Germany
2017	**Cooperative Advice Coaching in Teaching Practice** HDA Darmstadt, Germany
2017	**Teaching Work Shadowing and Evaluation** HDA Darmstadt, Germany
2017	**Peer Feedback Training with Online Scenarios** HDA Darmstadt, Germany
2017	**Enhancing Students towards Self-Organized Learning and Working** HDA Darmstadt, Germany
2017	**Effective Teaching – Basics PII** HDA Darmstadt, Germany
2016	**Effective Teaching – Basics P1** HDA Darmstadt, Germany

Major Scientific Achievements

Introduction

As an Assistant Professor in *Interacting with Data* and head of the *Interactive Visual Data Analysis* (IVDA) group, the vision of my research activities is enabling humans to engage with and make sense of their data. My primary research is the characterization, design, and evaluation of visual-interactive interfaces that combine the strengths of both humans and algorithms in visual analytics, interactive machine learning, and data science applications. My human-centered focus includes user-centered design, design studies, human factors, and new methods of human knowledge externalization and preference elicitation, aiming to integrate expert knowledge into data analysis and make processes more personal. My model-driven focus ranges from unsupervised to supervised machine learning, including cluster analysis, dimensionality reduction, active learning, regression, and classification. My data-centered focus includes time series data, multivariate and mixed data, and multimodal data. From a task perspective, my work supports exploratory data analysis: enabling sense-making, decision-making, and hypothesis-building, especially when users do not yet know what to search for or how to approach the data. Important application domains include climate and Earth observation, sustainability development, digital libraries, digital humanities, human motion analysis, service and energy network analysis, manufacturing and automotive optimization, (political) decision-making, music classification, sports data analysis, finance and portfolio management, as well as medical, patient-related, and digital health research. Please refer to my Personal Website for details.

For my scientific achievements, I have received several prestigious personal awards:

- **EuroGraphics Young Researcher Award** (2022)
- **Eurovis Young Researcher Award** (2021)
- **Dirk Bartz Prize** for Visual Computing in Medicine (2017)
- **Hugo-Geiger Prize** for excellent PhD Theses (2016)

Publication statistics as of 2025-09-13:

- Citations: **2936**
- H-index: **28**
- i10-index: **59**
- Publications: >**100**
- Journal Publications: **39**
- Peer-reviewed Conference Full Papers: **28**
- Co-author network (max. five per paper): >**150**

Previous Research – Methodological Overview

From a methodological perspective, a useful way to structure my research is differentiating between 1) *technique-driven*, 2) *problem-driven*, 3) *evidence-driven*, and 4) *foundations-driven* research.

Technique-driven Research

Motivating factors for technique-driven research are to improve existing methods for data analysis or to invent innovative interactive data science techniques for more effective and human-centered analysis. My contributions include interactive visual interfaces that support users in performing a wide range of analysis tasks and machine learning techniques. These span clustering, dimensionality reduction, classification, preprocessing, retrieval, and recommendation algorithms. From a model perspective, many contributions have improved interpretability, explainability, and guided analysis in human-model collaboration. From a data perspective, I contributed techniques for time series, event sequences, multidimensional, multimodal, and metadata. These efforts support data cleaning, curation, labeling, annotation, feature extraction, transformation, normalization, reduction, and aggregation. From a human perspective, I focus on knowledge generation through interactive pattern detection, contextualization, and insight generation interfaces. Human-centered contributions also include methods for personalizing data analysis, enabling users to express knowledge and preferences, as well as balancing control in human-centered AI contexts. Finally, one of my central design goals has always been practical applicability for broad user groups.

The statistics for my 82 publications focused on technique-driven research are as follows:
- Journal papers, peer-reviewed: **24**
- Full conference papers, peer-reviewed: **22**
- Short conference papers and workshops: **36**

Problem-driven Research

At the heart of problem-driven research is a data analysis challenge for a particular domain expert (group) that I address through interdisciplinary collaboration. In this type of study, I take the role of a human-centered data analytics designer and developer, tasked to a) understand and abstract the domain problem and data, b) iteratively design a most meaningful solution in close collaboration with experts, c) validate the solution, and d) reflect, generalize, and discuss the design process. These methodological elements form the structured basis for the publication of this applied research in the visualization research domain, as a design study [**?**]. Design studies in general are set out to overcome ill-defined data analysis problems that can neither be solved by a domain expert, nor by a data scientist alone, inherently requiring an interdisciplinary approach, usually creating two major benefits: First, such design studies contribute domain-specific solutions for their data analysis challenges. Second, design studies help to ground research in visual analytics and human-centered artificial intelligence into real-world problems and thus drive innovation, respectively. Figure **??** indicates the heterogeneity and diversity of the three main involved entities and actors (humans, data, and models), and amplifies the impact of and need for meaningful design considerations to arrive at useful data analytics solutions. So far, my experience with problem-driven research includes the following application domains: Earth observation, sustainability development, digital libraries, digital humanities, human motion analysis, horse gait analysis, renewable energy networks, telecommunication networks, manufacturing, automotive

optimization, political decision-making, music classification, sports data analysis, finance data analysis, as well as medical and patient-related research in particular.

The statistics for my 43 publications focused on problem-driven research are as follows:
- Journal papers, peer-reviewed: **15**
- Full conference papers, peer-reviewed: **12**
- Short papers, workshops, posters: **16**

Foundations-Driven Research

My main contributions to the theoretical foundations of interactive visual data analysis, data science, and machine learning span concepts, methodologies, models, and taxonomies. Conceptual work can be formative, i.e., intellectual contributions made before implementation, development, and empirical testing. In contrast, most of my foundation-driven research is summative, resulting from abstraction, reflection, and generalization of theories, methods, and processes. These contributions often focus on a) data transformation processes steered by users, b) user workflows involving interaction with algorithmic models for analysis tasks, and c) taxonomies, typologies, or ontologies that describe and structure existing research while identifying gaps in the design space. Figure **??** presents the Interactive Visual Data Canvas, my conceptual model for modern human-data-model interaction. This framework structures my future research agenda into analytics building blocks for: a) human knowledge generation, b) human knowledge externalization, c) data enrichment, d) data exploration, e) model improvement, and f) model explanation. Each block links methodological foundations with practical goals, supporting a structured and interpretable approach to human-centered data analysis.

The statistics for my 29 publications focused on foundations-driven research are as follows:
- Journal papers, peer-reviewed: **9**
- Full conference papers, peer-reviewed: **6**
- Short papers, workshops, posters: **14**

Evidence-driven Research

By evidence-driven research, I refer to the study of human factors and behavior, as well as characteristics and properties of data and models to create empirical and interpretable evidence. Building upon the principles of the scientific method, my results typically rely on the strengths of scientific controls and statistical analyses. Depending on the study subject, results may take the form of statistical significance, confidence values, interpretable visualizations of insights, or statements about formalized observations. I have applied a wide range of experiment types, from controlled lab experiments and studies to in-field user studies in the environment of domain experts. Beyond user studies, data studies have been effective in investigating data and model characteristics, where I control data parameters and observe model or process behavior. Example study areas include data labeling, behaviors of users while labeling data, perceptual effects of users for the use of colors, the effects of event sequence alignment, the effect of patient treatment

in prostate cancer research, and exploring the role of blood glucose prediction for diabetes self-management. Example topics include visual interfaces for data labeling, user behavior during labeling tasks, perceptual effects of color usage, event sequence alignment effects, treatment effects in prostate cancer research, document collection usage in the digital humanities, or blood glucose prediction for diabetes self-management.

The statistics for my 32 publications focused on evidence-driven research are as follows:
- Journal papers, peer-reviewed: **11**
- Full conference papers, peer-reviewed: **6**
- Short papers, workshops, posters: **15**

Achievements by Research Themes

In this subsection, I briefly describe three of my main themes. As it is not the idea of this document to have references included, I refer to my entire publication list, which is available at my Personal Website.

Visual Analytics for Exploratory Search in Digital Libraries: My research focused on interactive visual analytics systems for exploratory search in data and document collections, driven by emerging concepts lik data-centered research, data science, digital libraries, information retrieval, content-based access, relation-discovery in large data collections, and re-using open research data. These systems now enable domain experts to: (i) make sense of their own and external data, (ii) generate new hypotheses through visual data exploration, and (iii) validate hypotheses using visual querying and interactive search functions. These systems integrate into domain experts' workflows, especially in data-driven research. In the context of exploratory search, I conducted interdisciplinary design studies with domain experts in research and industry, as well as non-experts. Furthermore, I introduced concepts, guidelines, techniques, and systems that show how data scientists and domain experts can co-design effective and usable exploratory search systems. Recently, I have started a research stream on bridging digital editions from the humanities, providing exploratory interactive access to multiple edition projects which so far only co-existed as isolated islands on the web. Through novel interactive visual exploration, filtering, and search support, these editions will be standardized and conflated to a hub infrastructure, to establish FAIR principles in the Swiss digital edition landscape.

For its beneficial and innovative impact on society, my dissertation was awarded the **Hugo-Geiger Prize for Excellent Ph.D. Theses** by the Fraunhofer foundation in 2016, and I was nominated for the GI Prize with an **Outstanding Dissertation in Computer Science** by the Gesellschaft für Informatik (GI). Also, two of my best paper awards directly refer to contributions to exploratory search.

Visual Analytics in Healthcare: With several collaborative and interdisciplinary projects, medical data analysis and personal health have become my predominant application domains. From the observation of physicians in their respective disciplines as well as of patients in digital and personal health scenarios, I can report on a paradigm change in research, clinical treat-

ment, and practice towards data-centered and patient-centered approaches, e.g., to foster a sound prognosis prior to severe medications and treatments, or to facilitate patient self-management. Particularly in the prostate cancer domain, I had the opportunity to familiarize myself with the medical domain, learn about data-centered and patient-centered problems, and understand special challenges with electronic health records. I have created visual analytics systems for patient-related data now allowing physicians to conduct data analysis in novel ways. Physicians benefit from visualizations of health records data, overviews of thousands of patient records, interactive techniques for the creation of cohorts (e.g., for clinical tests), and the in-depth analysis of patient-related attributes (e.g., for hypothesis creation or validation). Along these lines, I have, e.g., designed a tool that allows physicians to label the well-being status of patients, which is subsequently learned by a regression-based ML model. Learning expert knowledge with ML also gained attention in the community, e.g., at IEEE VIS Workshop on Visual Analytics in Healthcare, which I was organizing for seven years (2015–2021) before transitioning into the role of the general chair and steering committee member. Currently, I'm also guest editor of the Journal of Informatics in Health and Biomedicine (JAMIA), for a special issue on interactive visualization of electronic health records. Other contributions in healthcare include novel visual interfaces for the analysis of thousands of multivariate patient histories at the same time in an iteratively designed dashboard, as well as a visual analytics system for exploring activity patterns of people with multiple sclerosis, equipped with wearables revealing sensor data. Finally, I collaborated in application-driven approaches about self-service data preprocessing, as well as exploratory COVID-19 cause-effect analyses (best paper award at EuroVA 2021).

For my contributions to the medical domain, I received the **Dirk Bartz Prize for Visual Computing in Medicine** for big data solutions, from the EuroGraphics Association (EG) in 2017.

Interactive Machine Learning and Explainable AI: One of my major research areas combines data mining, information retrieval, machine learning techniques with interactive visual interfaces to design and develop interactive ML methods and processes. I focus on assigning users an active role in the ML process and increase the transparency of ML model output, leading to enhanced user trust. From the start of my research in visual analytics, I worked with cluster analysis and dimensionality reduction, expanding to include classification and regression models, as well as novel forms of semi-supervised ML. My contributions span the interactive creation, training, analysis, quality assessment, and iterative refinement of ML techniques aimed at exploring complex datasets and explaining ML models. I have, e.g., proposed one of the first whitebox ML approaches to neural-network-based interactive visual clustering in my Diploma thesis, and later on investigated techniques for the visual control and evaluation of time-series segmentation and labeling techniques in a collaborative DFG project. I am well known in the international community for my contributions to interactive data labeling, addressing challenges of lacking training data for supervised machine learning, e.g., for classification and regression tasks. In several empirical works, I have proven that humans can compete with active learning strategies known in ML, and that joining forces in a joint human-in-the-loop approach can be most meaningful to cope with complex data labeling challenges. Building upon this, I have proposed the methodological framework for Visual-Interactive Data Labeling (VIAL), which remains

state-of-the-art. In addition, I have characterized, designed, and evaluated a series of interactive labeling techniques and systems, e.g., in the contexts of soccer player analysis, human motion analysis, personalized music classification, football player classification, and production processes of electrical engines. In recent years, I extended my contributions to interactive ML focusing on guided neural-network explanation, interactive feature selection for predictive time series models, interactively preprocessing multivariate time series, and interactively assessing class confusion for model building. To strengthen the connection between visual analytics and interactive ML, I have organized the EuroVA Workshop on Visual Analytics at Eurovis (EuroGraphics) several times, and am now part of the steering committee.

In recognition of my contributions to the characterization, design, and evaluation of visual analytics methods in interactive machine learning and data science applications, I received the **EuroGraphics Young Researcher Career Award** in 2022. Also, recent best paper awards at IEEE VIS 2021 and EuroVA 2020 directly relate to contributions to interactive ML.

Human-AI Collaboration and Human-Centered AI In the last decade, I have constantly contributed to responsible and human-centered human-AI collaboration by establishing conceptual foundations and rigorous methodologies that integrate human intuition with computational models. My work aims to bridge the gap between human cognitive strengths and machine capabilities, creating systems that improve data exploration, knowledge generation, and decision-making. Also, I contributed to human knowledge and preference elicitation by connecting preference elicitation with knowledge-assisted interfaces, enabling users to express preferences through annotations, scores, and rankings. My research emphasized transforming tacit knowledge into externalized knowledge using interactive visual interfaces to bridge user input for effective AI communication. This approach enhanced adaptability and interaction between humans and systems, advancing traditional methods in capturing user preferences. I have contributed dozens of novel techniques on forms of mixed-initiative, semantic interaction, human-in-the-loop interaction. The mixed-initiative and semantic interaction approaches enable AI systems to adapt to user input seamlessly, creating more intuitive and effective collaborations. My work in human-in-the-loop learning improved iterative refinement processes, enhancing AIs' learning from human feedback in real time. These works pushed forward how humans and AI can interact to create more insightful, adaptive, and responsive systems. My research extended into applied contexts where I collaborated with domain experts in interdisciplinary and transdisciplinary settings. This collaboration introduced human-AI interaction frameworks into practical applications, advancing digital transformation efforts in sectors like healthcare, digital humanities, finance, and other data-driven research fields. From an empirical point, my studies explored the successes and limitations of my various human-AI approaches. Through user studies and other evaluation methods, I shed light on effective strategies while identifying gaps and new forms of human-AI collaboration. This empirical work not only showcased successful cases but also highlighted the ongoing potential for improved interaction frameworks, collaborative strategies, human-AI workflows and decision-making processes. Currently, I'm facing the challenge of critical validation-driven human-LLM interactions, from a data analytics perspective, leveraging visual analytics methods as a means to critically assess LLM output and explanations.

In recognition of my contributions of combining the strengths of both humans and algorithms for data-driven decision-making, I received the **EuroVis Young Researcher Career Award** in 2021.