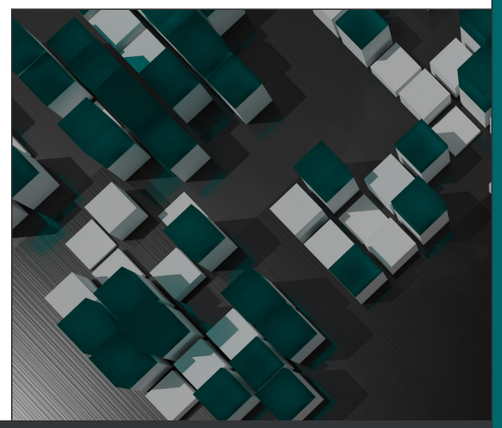
Annual REPORT 2026

SFB-TRR 161

Funded by DFG

CONTENT



ABOUT THE SFB-TRR 161

The **SFB-TRR 161 "Quantitative Methods for Visual Computing"** is a Transregional Collaborative Research Center. Partner institutions are the University of Stuttgart, University of Konstanz, Ulm University, and LMU Munich.

In this interdisciplinary research center, around 50 scientists in the fields of visualization, computer vision, computer graphics, human-computer interaction, linguistics, and applied psychology are working together to establish quantification as a key ingredient of visual computing research.

We see quantification as a cornerstone to further advance visual computing as an established and maturing research field.

Dear readers, dear members and friends of the SFB-TRR 161,

this summer we are entering the final phase of our 12-year research and development journey with the SFB-TRR 161—toward valid and sustainable methods and models that will prepare visual computing for an expanding range of requirements and applications.

What defines "good" visualization, and how can we objectively measure its quality and effectiveness? Since launching our research network on July 1st, 2015, the SFB-TRR 161 has made significant progress answering these questions, producing numerous published findings. You can find an overview of our current publications on pages 20 and 21.

The field of visual computing has undergone significant changes over the years, leading to an increased demand for reliable and accurate systems. This demand spans various areas of research and development and increasingly impacts our daily lives. In this context, our focus during the current third research period is on bringing new and existing research findings "into the world." The manifold possibilities offered by visual computing should benefit from the insights gained from the SFB-TRR 161 as soon as possible. A key strength of the TRR is its integrative approach, which considers visualization, computer graphics, image analysis, computer vision, and human-computer interaction in a collaborative manner. This holistic perspective is made possible through intensive collaboration among scientists from different specialized fields.

A prime example of successful collaboration achieved in a very short time is the hackathon, which is now held regularly. Read on page 4 to find out what happened at this year's event.

Our researchers not only maintain strong connections within the SFB-TRR 161, but also prioritize international collaboration. The research stays, which last several months, are particularly beneficial for our doctoral students. You can read more about their inspiring experiences on page 18. And once again we compiled the awards and conference highlights from the reporting period—see pages 8/9 and 14/15 in this issue.

Our consortium places a strong emphasis on diversity and gender equality, as demonstrated by the "Women* in Computing" workshop, which the SFB-TRR 161 has co-organized for several years. Another noteworthy event was the IEEE VIS 2025 panel on inclusive visualization research, which TRR researchers, in collaboration with a colleague from Linköping University, successfully organized and conducted in Vienna in October 2025. For more details about these activities, please refer to pages 5 and 10/11.

We wish everyone involved in the SFB-TRR 161 the best of luck during the final stretch and hope you enjoy reading this issue of the Annual Report.

Heike Lehmann
Daniel Weiskopf

Dr. Heike Lehmann
SFB-TRR 161 Manager

Prof. Dr. Daniel Weiskopf
SFB-TRR 161 Spokesperson

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3RD RESEARCH HACKATHON

EXPLORING GRAPH PERCEPTION IN VR

In March 2026, a group of SFB-TRR 161 researchers got together at the University of Konstanz to develop and refine research ideas in a focused, collaborative setting. As with our last two hackathons in 2024 and 2025, participants voted for a topic in advance. They chose a project focused on measuring, investigating, and gaining a better understanding of graph perception in VR with a depth cue.

After an initial brainstorming session, the group split into two teams. One team focused on conducting a post hoc analysis of the existing dataset. Their central question was: What factors shape how people perceive the complexity of graphs in virtual environments, especially when depth cues are missing in previously collected WebXR data? Over the course of the hackathon, the team built a prototype of their analysis approach, applied it to the dataset, and interpreted the resulting findings. By the end of the event, they had established a complete data analysis pipeline for the collected data.

The second team explored how eye tracking can be used to evaluate the impact of depth cues on graph readability in virtual environments. Their work centered on assessing the feasibility of analyzing depth perception in our VR context, determining which data can or should be recorded for different VR systems and configurations, and examining how that data should be computed and interpreted. The team approached this through literature review, proof-of-concept implementations, and initial pilot tests, with a particular focus on designing the experimental setup and defining accuracy metrics. Because of time limitations, the team did not reach the final testing stage, but intends to continue this work and integrate it into an upcoming study project.

Throughout the hackathon, participants exchanged ideas, discussed methodological challenges, and provided feedback across teams, thereby highlighting the collaborative character of the event. The two resulting complementary lines of work on depth perception provide a promising basis for future research.

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Participants of our third research hackathon in Konstanz.

ROBUSTSPRING: NEW BENCHMARK

Following the huge success of the high-detail, high-resolution Spring benchmark (https://spring-benchmark.org/) for evaluating the accuracy of approaches for 2D motion (optical flow), 3D motion (scene flow), and stereo estimation (published at CVPR 2023, almost 10.000 downloads and 175 citations), Project B04—in collaboration with Project A07 and the University of Mannheim/Max Planck Institute for Informatics—has released RobustSpring for evaluating the robustness of such approaches under image corruptions (e.g. noise, blur, rain, snow). The benchmark was presented at this year's International Conference on Learning Representations (ICLR 2026) in Rio de Janeiro, Brazil.

"Figure 1: RobustSpring" by V. Oei et al. is licensed under CC BY 4.0

Publication:

V. Oei et al., "RobustSpring: Benchmarking Robustness to Image Corruptions for Optical Flow, Scene Flow and Stereo," in *The 14th Conference on Learning Representations*, 2026.

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THE AVATAR IN A WHEELCHAIR: A CALL FOR MORE DIVERSITY IN THE METAVERSE

Virtual environments are inclusive because all users can choose avatars that allow them to leave their disabilities behind in the real world—right? For a long time, this was the stance both users and developers took on the metaverse. Now, a new study by researchers from the University of Stuttgart, the California State University at Fullerton, and the Max Planck Institute for Intelligent Systems investigated how users with disabilities feel when their avatar reflects their real-life disability.

The results: While some users with disabilities prefer to navigate virtual environments without their avatar representing their disability, many gave very positive feedback on their experiences with using an avatar that depicts them the way they see themselves. Together with the fact that the inclusive avatars frequently sparked interest in other users whom the study participants encountered in the metaverse and led to open conversations, the authors of the study take this as encouragement to call for more diversity in the metaverse.

Examples for the inclusive avatars that were used in the study. IMG: Katrin Angerbauer.

"We hope that the results of the study will provide the impetus to actively involve people with disabilities in the development and design of virtual reality technology, and to work together to break down structures of discrimination in virtual space. A disability should not be something that needs to be hidden, but something that can be lived openly in virtual space as well. People with disabilities belong in both the real and digital world," says Katrin Angerbauer, doctoral researcher in SFB-TRR 161 Project A08 and first author of the study.

The results of the study were published in The Journal of Strategic Information Systems.

Publication:

K. Angerbauer et al., "Inclusive avatars in the Metaverse: learning from the lived experiences of people with disabilities," *The Journal of Strategic Information Systems*, vol. 34, no. 4, 2025, doi: 10.1016/j.jsis.2025.101935.

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PANEL ON INCLUSIVE VISUALIZATION RESEARCH AT IEEE VIS 2025

Panelists Dominik Moritz, Danielle Albers Szafir, Cindy Xiong Bearfield, Bruce Walker, and Kim Marriott. IMG: Katrin Angerbauer

Who do we exclude by current visualization pracitices and how do we change that? This question was explored with VisAble, a panel at IEEE VIS 2025 in Vienna. The panel was organized by Nina Dörr (A08), Sita Vriend (A01), Katrin Angerbauer (A08), and Michael Sedlmair (A08) in cooperation with Miriah Meyer from Linköping University. With a wide variety of perspectives from the five panelists Bruce Walker, Kim Marriott, Danielle Albers Szafir, Cindy Xiong Bearfield, and Dominik Moritz, the discussion rounds were lively and tackled several controversial topics.

Together with the audience, the panelists thought about the definition of accessibility, target groups, the process of making visualizations more accessible, and adapting the research process toward more inclusivity. Regarding the research process, Marriott stressed the importance of lived experience and to treat participants not only as a means to an end but as equal co-researchers. In terms of target audiences, panelists mentioned that visualization research should not forget about people with sensory disabilities, neurodiverse populations, and the general public who are not too familiar with data visualizations. The individuality of needs was one of the core challenges discussed and where panelists proposed different strategies. Bearfield stressed the importance of user modeling to ease the load of accessibility testing, while Moritz pointed out the need for more adaptable visualization solutions. Walker emphasized the importance of multimodality and challenged all in the room to think about the definition of visualization: Is it too exclusive by itself?

Provocative questions like this kept the discussion animated with high audience participation. The high attendance and active participation were interpreted as hopeful signals by organizers and panelists. There is momentum and interest for the topic of inclusivity and accessibility with its many facets within the VIS community.

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Miriam Butt, project leader of Project D02 "Visual Analytics for Linguistic Representations," has been successful with her application for a new Collaborative Research Center. For the next four years, the German Research Foundation (DFG) will fund the SFB 1760: "Silence, Noise and Signal in Language."

In the new collaborative research center, Miriam Butt, who will also act as its speaker, and her research team at the University of Konstanz will investigate the systematics behind the occurrence and effect of 'silence' and 'noise' as fundamental parts of human speech. Furthermore, they aim to develop an interpretation algorithm for these linguistic elements.

With the Eurographics Gold Medal, **Oliver Deussen** (A01) has been honored for his longstanding contribution to the research field of visual computing by the European Association for Computer Graphics (Eurographics). The medal is awarded once a year to individuals who have made outstanding contributions to the goals of Eurographics and to the community at large.

In the past, Oliver Deussen—among other achievements—served as co-Editor in Chief of Computer Graphics Forum from 2012–2015. He has been a long-term member of the Eurographics Executive Committee, and he served as chair of the Association (2019–2020).

The German Research Foundation (DFG) has approved three years of funding for the project "Fine-Grained Assessment and Modeling of the Visual Quality of Highly Compressed Images," which is led by **Mohsen Jenadeleh** (A05).

The new project will expand on Mohsen Jenadeleh's research conducted within the framework of his previous DFG project "JND-based Perceptual Video Quality Analysis and Modeling." One of the key results of this previous project has been a substantial contribution to the development of the new international standard ISO/IEC DIS 29170-3:2026, which was formally released by ISO in February 2026.

Michael Sedlmair, project leader of SFB-TRR 161 Project A08 "Learning and Explaining Dimensionality Reduction through Visualization," will leave the University of Stuttgart for a professorship at TU Darmstadt. Starting October 1st, 2026, he will assume the chair of Visual Computing at TU Darmstadt and will simultaneously fulfill the role of Director of the Fraunhofer Institute for Computer Graphics Research (IGD), which conducts cutting edge research at the intersection of computer vision, computer graphics, data science, and AI. Despite the move, he will continue to head Project A08 until the conclusion of our final funding period, ensuring continuity of the research agenda.

VISITING SCHOLARS

Between September 2025 and May 2026, several international scientists visited our projects:

- Michaël Aupetit (QCRI) (Stuttgart, A08)
- Joanna Bergström (University of Copenhagen) (Munich, C06)
- Maxime Cordeil (University of Queensland) (Konstanz, D04)
- Emily Cross (ETH Zürich) (Konstanz, C01/C07)
- Michael Doggett (Lund University) (Stuttgart, A01)
- Sarah Goodwin (Monash University) (Stuttgart and Konstanz, A01/ D04)
- Tony Huang (University of Technology Sydney) (Konstanz, D04)
- Sebastian Hubenschmid (Aarhus University) (Konstanz, C01/C07)
- Christophe Hurter (University of Toulouse) (Konstanz, D04)
- Clemens Klokmose (Aarhus University) (Konstanz, C01/C07)
- Ernst Kruijff (Bonn-Rhein-Sieg University of Applied Sciences) (Stuttgart, A08)
- Yi Li (TU Wien) (Konstanz, C01/C07)
- Jakub Lokoč (Charles University) (Konstanz, A03)
- Jacob Miller (TU Munich) (Stuttgart, A01)
- Till Nagel (Mannheim University) (Stuttgart, A08)
- Hugo do Nascimento (Federal University of Goiás) (Konstanz, D04)
- Mike Preuss (Leiden University) (Konstanz, A09)
- Bernhard Riecke (Simon Fraser University) (Stuttgart, A08)
- Benjamin Tag (UNSW Sydney) (Konstanz, C01/ C07)
- Michael Wybrow (Monash University) (Konstanz, A09)

For more about our visiting scholars, see our "Talks & Lectures" section (pp. 12–13).

SFB-TRR 161 NEW ARRIVALS

- Masoumehsadat Hosseini, B01
- Simon Röhrle, C01
- Sophie Sadler, A08

SFB-TRR 161 ALUMNI

- Anke Reinschlüssel, C07
- Sebastian Hubenschmid, C01

NEW EXTERNAL COLLABORATIONS

Our researchers work together with both national and international colleagues on a regular basis. In 2025 and 2026, those collaborations included:

- Organization of PhysioCHI MeetUp: Teodora Mitrevska (LMU Munich), Abdallah El Ali (Utrecht University), Benjamin Tag (UNSW Sydney) (Munich, C06)
- Collaboration visit to University of Jaffna, Sri Lanka: DAAD-SDG project "Bridging the Digital Divide for South Asian Languages (DigSAL) (Konstanz, A01/D02)
- Collaboration with VCG Lab, Harvard University: Chunggi Lee, Johannes Knittel, Hanspeter Pfister (Stuttgart, A08)
- RobustSpring Benchmark (ICLR 2026): Margret Keuper (University of Mannheim / Max Planck Institute for Informatics), Shashank Agnihotri (University of Mannheim) (Stuttgart, B04)
- Organization of AIpCHI Workshop "Beyond Fatigue: Building an Ergonomic Future for XR": Yi Li (TU Wien) (Konstanz, C01)

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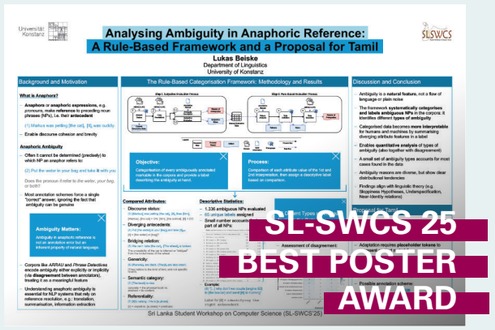
TWO AWARDS FOR EXHIBITION "ARRIVING?"

For its interactive design concept, the exhibition “Arriving? Migration, Faith and Identity“ won not just one but two great awards: a DDC Gold Award in the category *Architecture / Space* and a COMM Bronze Award in the category *Talent Space / Exhibition*. The exhibition was curated by students and was the result of the teaching module Media Exhibition Design, which is being taught in Konstanz since 2013 and was originally designed by **Harald Reiterer** (C01) and his colleague Eberhard Schlag from HTWG Konstanz. For the 2025 exhibition, **Jonathan Wieland** (C01) also joined the teaching team. SFB-TRR 161 Project Ö further supported the exhibition with additional funding.

- Projects C01, Ö
- Konstanz



SL-SWCS 25 BEST POSTER AWARD

At the Sri Lanka Student Workshop on Computer Science 2025 (SL-SWCS25), **Lukas Beiske** (D02) won a Best Poster Award for his poster “Analysing Ambiguity in Anaphoric Reference: A Rule-Based Framework and a Proposal for Tamil.“ The workshop was held on December 13th, 2025, at the Department of Computer Science, University of Jaffna, Sri Lanka. The biennial, one-day conference serves as a platform for research students to present work through extended abstracts, featuring both oral and poster presentations. SFB-TRR 161 project leader Oliver Deussen (A01) was also invited to the workshop as a keynote speaker.

- Project D02
- Konstanz

CVPR OUTSTANDING AREA CHAIR AWARD

Andrés Bruhn (B04) was awarded an Outstanding Area Chair Award at the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) for his efforts in overseeing and coordinating the reviewing process in his area of research (optical flow, adversarial attacks). CVPR 2026 was held from June 6th to June 12th in Denver, Colorado, USA.

- Project B04
- Stuttgart

ICCV OUTSTANDING REVIEWER AWARD

At the IEEE/CVF International Conference on Computer Vision (ICCV 2025), **Andrés Bruhn** (B04) won an Outstanding Reviewer Award for his dedicated work as a reviewer. ICCV honors the top 3% of its reviewers with this prize. ICCV 2025 took place at the Hawai'i Convention Center in Honolulu, Hawai'i, USA from October 19th to 23rd, 2025.

- Project B04
- Stuttgart

AWARDS

AIRBUS RESEARCH AWARD “CLAUDE DORNIER“

Sabrina Jaeger-Honz (D04) received the Airbus Research Award “Claude Dornier” for her dissertation “Combining Bio- and Cheminformatics for Small Data Sets: Microcystins as a Use Case.“ Since 1989, Airbus Defence and Space has been promoting young scientists at the University of Konstanz with this award at its Friedrichshafen site. The prize money of € 6,000 is awarded for outstanding doctoral theses in the fields of physics, mathematics, computer science, and economics. Using computational methods, Sabrina's thesis presents multiple interconnected approaches in order to overcome difficulties associated with studying small datasets in bio- and cheminformatics.

- Project D04
- Konstanz

HONORABLE MENTION LONG PAPER AWARD

At the IEEE Workshop on Uncertainty Visualization: Unraveling Relationships of Uncertainty, AI, and Decision-Making, Daniel Klötzl, Ozan Tastekin, **David Hägele** (A01), Marina Evers, and **Daniel Weiskopf** (A01, B01, INF, MGK, Ö) won an Honorable Mention Long Paper Award. In their paper “Uncertainty-Aware PCA for Arbitrarily Distributed Data Modeled by Gaussian Mixture Models,“ they describe how multidimensional data with uncertainties that are not well described by normal distributions can be projected to a low-dimensional space using uncertainty-aware principal component analysis (UAPCA). The workshop took place in conjunction with IEEE VIS 2025 in Vienna.

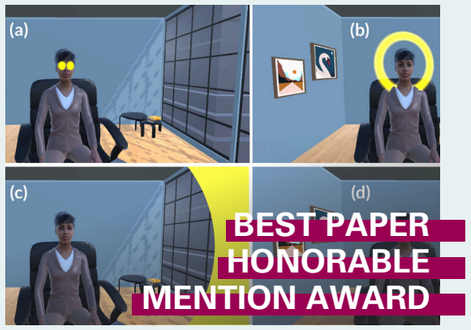
- Project A01
- Stuttgart

“Three models of the mausoleum” by W. Kerle-Malcharek et al. is licensed under CC BY-NC-SA 4.0

IEEE CH BEST INNOVATION PAPER AWARD

For their publication “The Junction of Immersive Analytics and Virtual Reconstructions – A Case Study on the Mausoleum of Emperor Maxentius,“ **Wilhelm Kerle-Malcharek** (D04), Niklas Hann-von-Weyhern, Ulf Hailer, Steffen Diefenbach, Stefan Feyer, **Karsten Klein** (A09) and **Falk Schreiber** (D04, INF, MGK, Ö) won the Best Innovation Paper Award at the 2nd IEEE International Conference on Cyber Humanities (IEEE CH). In their paper, the team explores how immersive analytics can help improve how cultural heritage is experienced and studied. As a case study, they utilize three digital reconstructions of the Mausoleum of Emperor Maxentius in Rome.

- Projects D04, A09
- Konstanz



“Figure 1: The four conditions of displayed cues” by M. Wieland et al. is licensed under CC BY 4.0

BEST PAPER HONORABLE MENTION AWARD

At the Augmented Humans (AHs) International Conference 2026, Markus Wieland, **Kathrin Schnizer** (C06) **Francesco Chiossi** (C06), **Nina Doerr** (A08), Florian Lang, Thomas Kosch, and **Michael Sedlmair** (A08) won a Best Paper Honorable Mention Award. In their paper “Making Eye Contact Accessible: Augmenting Gaze in Job Interviews for People with Visual Impairments,“ they investigate how the disadvantages that people with visual impairments face in job interviews due to nonverbal communication could be mitigated by introducing several types of gaze cues in virtual reality. The conference was held in Okinawa, Japan, from March 16th to 19th, 2026.

- Projects A08, C06
- Stuttgart, Munich

WOMEN* IN COMPUTING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Supported by the SFB-TRR 161, the fifth edition of the successful workshop series took place in Berlin.

The fifth Workshop on Women* in Computing was dedicated to the topic of balance and its many meanings when shaping a career in computing. A group of almost forty participants, speakers, and organizers gathered at the TU Berlin to reflect on what finding balance means for them and their careers in inspiring talks and open discussions.

As became apparent during a round of flash introductions, the group of workshop attendees was once again highly diverse and interdisciplinary. This highlighted the relevance of the topic across different disciplines and career stages and brought many fresh perspectives to the discussion rounds.


SIGCHI president Neha Kumar spoke about living fuller lives with fuller jars.

In their talks, the invited speakers gave some unique and personal insights into their careers and research domains.

Neha Kumar, associate professor at Georgia Tech and SIGCHI president, tackled the topic of balance in terms of figuring out our priorities and building communities that help us maintain them. Under the motto "living fuller lives with fuller jars," she created a powerful metaphor for keeping our balance despite having many responsibilities and aspirations.


Giulia Barbareschi shared the stations of her international career with the audience.

Focus of the talk by Giulia Barbareschi, who is a professor at the University of Duisburg Essen, were the challenges of an international academic career. In addition to sketching her own path, which has led her from Italy to Ireland, England, and Japan before taking a professorship in Germany, she shared her own strategies for dealing with impostor syndrome, being more strategic about one's research, and managing time and progress.

Making plans, adapting to changes, dealing with judgement, and being gentle with ourselves were some of the topics Carla De Angelis (Ecolab) touched upon in her talk. Having two decades of experience in technology and digital transformation across global organizations, she was able to share many personal experiences of juggling conflicting expectations and not losing sight of what it is that we want for ourselves.

"I gave myself the grace to be imperfect, knowing I was building a different kind of success," Ghada Helal, software test engineer at Dematic GmbH, reflected on her own career. In her talk, she shared her personal story of building a life and a career in a different country and different culture and illustrated how she turned her own expat struggles into a community strength by co-founding a network for Egyptian women in Germany.

In the open discussion and networking rounds which followed the talks, participants had a chance to tackle the topics raised during the workshop in more depth and to form new connections. Once again, the workshop format proved to be a valuable platform for exchanging ideas and tips and further strengthening a network of women in computing. A sixth edition of Women* in Computing is planned for spring 2027.

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Carla De Angelis during her talk "Finding Your Balance: Evolving Priorities in Work, Life, and Motherhood".


Ghada Helal talked about building a life and a career in a different country and a different culture.

ABOUT THE WOMEN* IN COMPUTING WORKSHOP SERIES

Held for the first time in October 2022 at the University of Stuttgart, the Women* in Computing Workshop has been raising topics that greatly impact women's careers in computing and providing a valuable platform to exchange ideas and connect with each other for five consecutive years now. Every year, the workshop features guests that are themselves successful researchers from both industry and academia, providing participants with valuable insights and new impulses for their own careers in computing.

PREVIOUS EDITIONS OF WOMEN* IN COMPUTING


The first Workshop on Women* in Computing took place in October 2022 in Stuttgart.

Participants of the 2nd Workshop on Women* in Computing on June 22nd, 2023 in Konstanz.


In July 2024, the 3rd Workshop on Women* in Computing was held in Munich.


The 4th Workshop on Women* in Computing took place in Ulm, thereby completing its tour of all SFB-TRR 161 sites.

LECTURES

Between October 2025 and February 2026, ten renowned experts shared their insights and research findings from a variety of fields related to visual computing in the most recent edition of our lecture series:

Oct 20th, 2025: Till Nagel (Mannheim University of Applied Sciences): "Embedded Visualization of Urban Data: Concepts, Contexts and Perspectives"

Oct 27th, 2025: Jacob Miller (TU Munich): "Evaluating Visualization Quality from Mathematical Soundness to Human Perception"

Nov 10th, 2025: Sarah Goodwin (Monash University): "Human-Centred Information Visualisation for the Energy Sector (and beyond)"

Nov 17th, 2025: Mike Preuss (Leiden University): "Game AI and Immersive Analytics: Save the World Together?"

Nov 24th, 2025: Tony Huang (University of Technology, Sydney): "Supporting Remote Guidance Through AR-Based Sharing of Multi-Model Communication Cues"

Dec 8th, 2025: Michael Wybrow (Monash University): "Human Interfaces Across Domains: Optimisation, Reasoning, Health & Energy"

Dec 15th, 2025: Hugo do Nascimento (Federal University of Goiás): "Interactions Between Physical and Virtual Spaces"

Jan 19th, 2026: Jakub Lokoč (Charles University): "Interactive Video Search Challenges in the Age of LLMs"

Jan 26th, 2026: Joanna Bergström (University of Copenhagen): "The Virtual Body as Interface: Motor Learning Foundations for Interaction in Virtual Reality"

Feb 2nd, 2026: Michael Doggett (Lund University): "Efficient Utilisation of Silicon for Real-Time Rendering"

Till Nagel held the first lecture of the series in October 2025.

Sarah Goodwin shared her insights about information visualization for the energy sector.

Jacob Miller's lecture dealt with "Evaluating Visualization Quality from Mathematical Soundness to Human Perception".

Joanna Bergström and Sven Mayer during her visit at LMU.

Tony Huang visited Konstanz in November 2025.

Mike Preuss' lecture posed the question: "Game AI And Immersive Analytics: Save the World Together?"

Michael Wybrow on "Human Interfaces Across Domains: Optimisation, Reasoning, Health & Energy."

Hugo do Nascimento discussed "Interactions Between Physical and Virtual Spaces" in his lecture.

Jakub Lokoč on "Interactive Video Search Challenges in the Age of LLMs."

Final lecture with Michael Doggett in February 2026.

ETVIS 2026 KEYNOTE BY BARBARA TVERSKY

Supported by the SFB-TRR 161, leading American cognitive psychologist Barbara Tversky gave a keynote at ETVIS 2026 in Marrakesh, Morocco. In her keynote speech "Thinking with the Eye, the Hand, and the Page," she explored how drawing, sketching, and visual representation extend human thought beyond the mind, enabling creativity and discovery through the dynamic interaction of eye, hand, and page, while highlighting the challenges this poses for GenAI.

TALKS IN 2025 & 2026

Nov 11, 2025: Maxime Cordeil (University of Queensland, Australia): "Immersive Analytics: Spatial Computing Paradigms for Data Understanding"

May 4, 2026: Bernhard Riecke (Simon Fraser University, USA): "Virtual Potential, Real Challenges: Navigating the Challenges and Potentials of VR/XR"

May 4, 2026: Ernst Kruijff (Bonn-Rhein-Sieg University of Applied Sciences, Germany): "Haptic Feedback for 3DUIS - From Head to Toe"

May 22, 2026: Michaël Aupetit (QCRI, Quatar): "Classes Are Not Clusters, or Are They? A Visual Analytics Perspective on AI Alignment"

TALKS

Conferences and Workshops

In 2025 and 2026, researchers of the SFB-TRR 161 once again participated in a large number of national and international conferences and workshops. They presented their research as papers, posters or in keynote talks and panel discussions. For their outstanding work, they won several conference awards (cf. pp. 8/9).

Special conference highlights included the 5th Workshop on Women* in Computing in Berlin and the 10th Workshop on Eye Tracking and Visualization (ETVIS), which were both co-organized and supported by the SFB-TRR 161.

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2025

SEP

GD 2025
The 33rd International Symposium on Graph Drawing and Network Visualization, Norrköping, Sweden

IEEE CH 2025
2nd IEEE International Conference on Cyber Humanities, Venice, Italy

BriGap-2
Bridges and Gaps between Formal and Computational Linguistics, workshop held at IWCS 2025, Düsseldorf, Germany

QoMEX 2025
17th International Conference on Quality of Multimedia Experience, Madrid, Spain

OCT

ISMAR 2025
IEEE International Symposium on Mixed and Augmented Reality, Daejeon, South Korea

ICCV 2025
International Conference on Computer Vision, Honolulu, Hawai'i, USA

ICIP 2025
IEEE International Conference on Image Processing, Anchorage, Alaska, USA

NOV

VIS 2025
IEEE Visualization Conference, Vienna, Austria

IEEE Workshop on Uncertainty Visualization
Unraveling Relationships of Uncertainty, AI, and decision-Making, workshop held in conjunction with VIS 2025, Vienna, Austria

MERCADO
Multimodal Experiences for Remote Communication Around Data Online, workshop held in conjunction with VIS 2025, Vienna, Austria

Human Factors in Immersive Analytics
Workshop held in conjunction with VIS 2025, Vienna, Austria

VRST'25
ACM Symposium on Virtual Reality Software and Technology, Montreal, Canada

DEC

SL-SWCS25
Sri Lanka Student Workshop on Computer Science 2025, Jaffna, Sri Lanka

2026

MAR

IEEE VR 2026
33rd IEEE Conference on Virtual Reality and 3D User Interfacess, Daegu, Korea

AIpCHI 2026
Human-Computer Interaction (HCI) Conference of the Alpine region, Ascona, Switzerland

Beyond Fatigue: Building an Ergonomic Future for XR
Workshop at AIpCHI 2026, Ascona, Switzerland

WACV 2026
IEEE/CVF Winter Conference on Computer Vision, Tucson, Arizona, USA

CAA 2026
53rd Conference of Computer Applications and Quantitative Methods in Archaeology, Vienna, Austria

APR

CHI 2026
ACM CHI Conference on Human Factors in Computing Systems, Barcelona, Spain

CHI 2026 Workshop on Data Literacy
Workshop held at CHI 2026, Barcelona, Spain

Dagstuhl Seminar 26172
Exertion and Fatigue in Body-Based Interactive Systems, Schloss Dagstuhl, Germany

PacificVis 2026
19th IEEE Pacific Visualization Conference, Sydney, Australia

ICLR 2026
14th International Conference on Learning Representations, Rio de Janeiro, Brazil

MAY

WiC 2026
5th Workshop on Women in Computing,* Berlin, Germany

LREC 2026
15th Language Resources and Evaluation Conference, Palma de Mallorca, Spain

JUN

ETRA 2026
ACM Symposium on Eye Tracking Research & Applications, Marrakech, Morocco

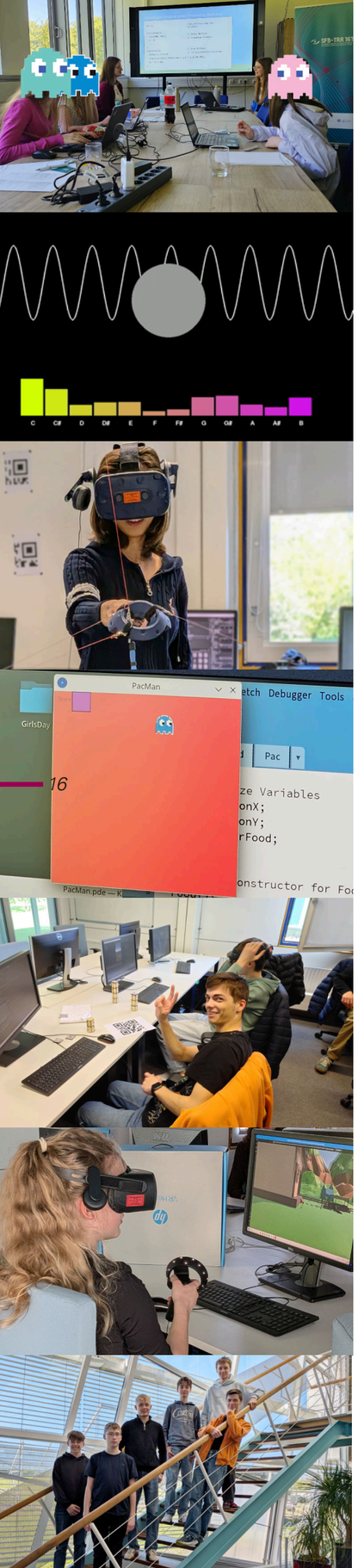
ETVIS 2026
10th Workshop on Eye Tracking and Visualization, held in conjunction with ETRA 2026, Marrakech, Morocco

CVPR 2026
IEEE/CVF Conference on Computer Vision and Pattern Recognition, Denver, Colorado, USA

EuroVis 2026
The Eurographics Conference on Visualization, Nottingham, UK

SELECTED CONFERENCE HIGHLIGHTS IN 2025 & 2026

September 2025: IEEE CH 2025 Best Innovation Paper Award for "The Junction of Immersive Analytics and Virtual Reconstructions – A Case Study on the Mausoleum of Emperor Maxentius" (cf. p. 9) **October 2025:** Outstanding Reviewer Award for Andrés Bruhn (B04) at ICCV 2025 (cf. p. 8) **November 2025:** "Honorable Mention Long Paper Award for Uncertainty-Aware PCA for Arbitrarily Distributed Data Modeled by Gaussian Mixture Models" at IEEE Workshop on Uncertainty Visualization (cf. p. 9) +++ Keynote "Fluid Interaction for Immersive Analytics" by Harald Reiterer (C01) at the Human Factors in Immersive Analytics Workshop at VIS 2025 +++ VisAble Panel at IEEE VIS 2025 co-organized by Nina Dörr (A08), Sita Vriend (A01), Katrin Angerbauer (A08) and Michael Sedlmair (A08) (cf. p. 5) **March 2026:** Keynote "Revisiting (my) HCI Research: How (my) previous research has shaped my understanding of research and HCI" by Harald Reiterer (C01) at AIpCHI 2026 **April 2026:** RobustSpring Benchmark presented at ICLR 2026 by project B04 (cf. p. 4) **May 2026:** 5th Workshop on Women* in Computing co-organized by SFB-TRR 161 researchers Tiare Feuchtner (C07) and Anke Reinschlüssel (C07) **June 2026:** ETVIS 2026 Keynote "Thinking with the Eye, the Hand, and the Page" by Barbara Tversky supported by the SFB-TRR 161 (cf. p. 13) +++ Outstanding Area Chair Award for Andrés Bruhn (B04) at CVPR 2026 (cf. p. 8)



EVENTS FOR SCHOOL STUDENTS

GIRLS' DAY WORKSHOPS IN KONSTANZ AND STUTTGART

We look back on successful Girls' Day events at our locations in Stuttgart and Konstanz. In two workshops, our participants learned just how diverse, exciting, and creative visualization research can be.

At the Visualization Research Center in Stuttgart, the eleven participants let their creativity unfold in various projects: favorite songs were transformed into colorful visualizations, and 3D environments were designed according to their own ideas and then explored in virtual reality. In numerous demos, the girls also learned about technologies and applications used in visualization research.

The three girls who visited the Department of Computer Information Science at the University of Konstanz discovered that you can achieve great results in programming in just a short time. After an introduction to the programming language Processing, they designed their very first computer game and, along the way, learned a lot about studying computer science and life at university.

BOGY INTERNSHIPS: ONE WEEK AS A VISUAL COMPUTING RESEARCHER

With more than thirty applications per semester, our offers for BOGY internships continue to draw a lot of interest from 9th and 10th grade students. Between October 2025 and May 2026, seven students had the opportunity to spend a week in our labs at the University of Stuttgart and the University of Konstanz. They discovered what working in academia looks like and refined their programming skills in various projects.

At the University of Konstanz, one student had the chance to pursue his particular interest in robotics while also learning more about computer science. In a collaboration with Heiko Hamann and the EXC Centre for the Advanced Study of Collective Behavior, he gained insight into projects which use large groups of mobile robots to study collective behavior.

The six students who visited the Visualization Research Center at the University of Stuttgart worked on their own projects, ranging from music visualization to a mixed reality application for the HoloLens 2. In various demos, they got to experience other technologies our researchers work with. “I really enjoyed working with the different hardware,” one of the students says about his time at VISUS. “Without the internship, we would never have had access to this kind of technology.”

PROGRAMMING COURSE FOR GIRLS

After the success in previous years, another programming course for girls from 7th grade upwards will take place from July 13th to 15th, 2026 at the University of Konstanz. Together with retired computer science teacher Thomas Nigelgen, the participants will take their first steps in computer graphics programming with Processing.

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FILM: ARTIFICIAL ORGANISMS AND ANIMATE MACHINES

What happens when human creativity encounters robotic precision? A video shot in summer 2025 at the Visual Computing Lab of Oliver Deussen (A01) documents the cooperation between internationally exhibited artist Gretta Louw and the e-David painting robot. In the film, Gretta Louw and Michael Stroh (A01), who leads the e-David project at the University of Konstanz, give an insight into creating paintings together with the e-David robot and reflect on the relationship between art, technology, and human creativity.

e-David working on the painting of an orchid as part of Gretta Louwe's series "Artificial Organisms and Animate Machines."

Gretta Louw's collaboration with Oliver Deussen's lab and the painting robot is funded through the EACVA Artist in Residency program. Led by Oliver Deussen on the German side, the EACVA (Embodied Agents in Contemporary Visual Art) project investigates the influence of robotics and AI on creativity. In her series “Artificial Organisms and Animate Machines,” Gretta Louw integrates AI and robotic creative expression with human authorship and subjective aesthetic preferences. In the case of the diptych of orchid paintings

After Louwe finished the background, e-David painted the petals in one of two orchid paintings.

shown the film, Louwe and e-David each painted the foreground on one of the two paintings while creating the background on the other one.

Watch the film here:

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ZEIT "ZIA" PODCAST WITH MARINA EVERS

Image: Phil Deras

From 2023 to 2025, Marina Evers was an associated postdoc in Project A01. Supported by the SFB-TRR 161, she participated in the Zia Fellowship Program of the ZEIT Verlag. In the podcast "Zia – Audible Women in Science," she introduced herself and her research. Some excerpts from the interview (translated):

In what contexts do we encounter your research in everyday life?
I do a lot of work with interactive methods and models, where it isn’t about creating or computing an image and displaying it, but rather about being able to interact with the data, to click on things, etc. In Visual Analytics we call that making an analysis. I’m always excited to see interactive visualizations in newspapers like the ZEIT where you can for example enter your postcode and see the results for different parts of Germany or something like that. I would say that many concepts that are related to my research or on which my research is built also feature prominently in this type of interactive visualization.

Data visualization and AI – Will humans soon become superfluous?
No. If the training data does not cover certain aspects, the trained model will naturally not be quite as balanced. Someone has to keep an eye on that and manage and control the AI model. Those models are very good at solving tasks that are very clearly defined. In reality though, when you want to analyze data, it is often not entirely clear what you are looking for. And in order to find that out, it is important that analysts have a basic understanding of what it is they are seeing. The same thing applies to visualizations: their purpose often isn’t necessarily one clearly defined task, but helping us figure out what it really is that we want to see.

Listen to the full interview (German):

YOUNG ACADEMICS

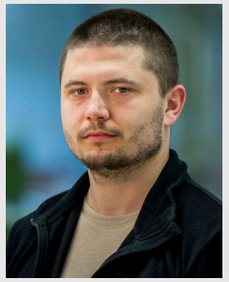
SFB-TRR 161 DOCTORAL RESEARCHERS ABROAD

In 2025 and 2026, SFB-TRR 161 doctoral researchers spent time in international labs as their research stay abroad. Supported by our Integrated Research Training Program, they were able to form valuable contacts and to advance their own projects.

From September to December 2025, **Nina Dörr** (A08) did a research stay at Harvard University in Boston, USA. During her stay, she worked closely with Prof. Hanspeter Pfister and the Visual Computing Group (VCG), but also visited the MIT Computer Science and Artificial Intelligence laboratory (CSAIL) as well as the HiDIVE Laboratory at Harvard Medical School.

During her time in Boston, Nina used the opportunity to connect with other researchers and discuss potential future collaborations as well as new directions for her own research. “One of the core research directions of the VCG is the development of visualization techniques for sports analytics in AR and VR. Their aim is to enhance sports with data visualization for fans, coaches and athletes. In my PhD, I focus on visual highlighting in situated and immersive visualization. Since sports contexts include a lot of motion and distractions, it is a great use case to establish further visual highlighting foundations and made it a great fit for a potential new research direction,” Nina says about her time in Prof. Pfister's lab.

Together with Prof. Pfister, Johannes Knittel and Chunggi Lee, Nina continues working on a research project beyond her time in Boston. Their results will likely be submitted as a paper in the near future.



Wilhelm Kerle-Malcharek (D04) spent two months at the University of Perugia in the lab of Giuseppe 'Beppe' Liotta. During his stay, he collaborated with Prof. Liotta's research group at the Digitization Centre of Cultural and Environmental Heritage (CeDiPa) on AI-supported avatars for VR that can deliver contextual information with a focus on monuments or archeological finds. Depending on its configuration, the avatar can break that information down for museum contexts, research purposes or other frameworks. In parallel, Wilhelm and the team from Perugia worked on a digital twin of the Temple of Clitunno.

Wilhelm did not only profit from the expertise of his hosts, but was also able to train his cooperation partners with regard to the usage of specific equipment or the implementation of photogrammetric projects. Further, a conversation with archeologist Andrea Polcarno led to Wilhelm's participation in a data collection at a newly excavated site near Panicale, Italy.

“My research stay offered many excellent opportunities to extend and deepen our already existing collaboration with Perugia,” says Wilhelm about his time abroad. “Our complementary skills in digital heritage and AI systems proved to be an excellent fit for future joint research initiatives.”

For the full reports visit our blog: www.visual-computing.org

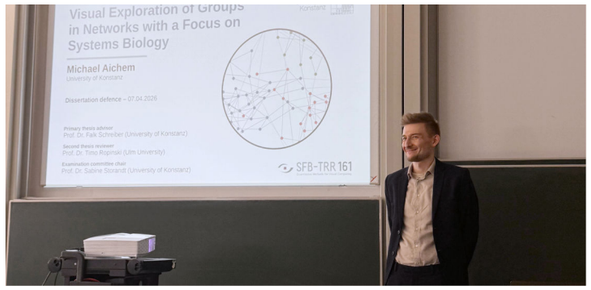
DOCTORAL SPEAKERS 2025/2026

Elected at the status seminar in 2025, **Katrin Angerbauer** (A08) and **Michael Stroh** (A01) served as doctoral speakers for 2025 and 2026. As such, they represented the interests of the doctoral researchers and organized events such as doctoral retreats and workshops.

Left: Katrin Angerbauer, Right: Michael Stroh

DISSERTATIONS

Since September 2025, two candidates completed their doctoral projects and successfully defended their dissertations:



In April 2026, **Michael Aichem** (D04) defended his thesis with the title “Visual Exploration of Groups in Networks with a Focus on Systems Biology.”

In October 2025, **Sebastian Hubenschmid** (C01) defended his thesis “Designing Fluid Interaction for Immersive Analytics using Hybrid User Interfaces in Mixed Reality.” His dissertation has been nominated for the dissertation award of the Gesellschaft für Informatik e.V. (GI).

Congratulations!

PUBLICATIONS

LATEST PUBLICATIONS (09/2025 – 06/2026)

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University of Stuttgart
SFB-TRR 161 "Quantitative Methods for Visual Computing"
Allmandring 19
D-70569 Stuttgart

University of Konstanz
SFB-TRR 161 "Quantitative Methods for Visual Computing"
Universitätsstraße 10
D-78457 Konstanz

Email: sfbtrr161@visus.uni-stuttgart.de

Web: www.sfbtrr161.de
Blog: www.visual-computing.org
Instagram: @sfbtrr161
Bluesky: @sfbtrr161.bsky.social
Mastodon: bawü.social/@sfbtrr161

V.i.S.d.P.
Prof. Daniel Weiskopf, Prof. Falk Schreiber

Design
Christina Warren

Editors
Patrick Gralka, Heike Lehmann, Falk Schreiber, Christina Warren, Daniel Weiskopf, Claudia Widmann

Authors
Katrin Angerbauer (ka), Andrés Bruhn (ab), Heike Lehmann (hl), Daniel Weiskopf (dw), Christina Warren (cwr), Sita Vriend (sv), Ying Zhang (yz)

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