

EuroVis 2023
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Preface

EuroVis 2023, the Eurographics Conference on Visualization was held in Leipzig, Germany from June 12 to June 16, 2023. After EuroVis 2022 in Rome, this was the second time after the Covid Pandemic that the international data visualization community could come together at the conference in-person. EuroVis has been an annual event since its inception in 1990. Over the years, the venue has changed names. It was originally started as the Eurographics Workshop on Visualization in Scientific Computing, and was called VisSym between 1999 and 2005. Since 2005, the conference has been called the Eurographics / IEEE VGTC Conference on Visualization, or EuroVis for short. This change of name is fitting: the conference broadly covers the field of data visualization. Topics include visualization techniques for spatial data, such as volumetric, tensor, and vector field datasets, and for non-spatial data, such as graphs, text, and high-dimensional datasets. EuroVis also covers the theory of visualization, hardware acceleration, large datasets, perception, interaction, user studies, information visualization, visual analytics, and many application areas of visualization. EuroVis is a global event. While it has always been held in Europe, the community comes from around the globe. This year, the Full Papers International Program Committee consisted of 102 members representing the global visualization research community, from North America, South America, South Asia, East Asia, Australia, and Europe. The papers are similarly from around the world.

As in previous years, the EuroVis proceedings are again published under a Gold Open Access model that makes the papers available to everyone. The full-papers proceedings for EuroVis are published as a special issue of the Computer Graphics Forum journal. 172 abstracts were submitted, followed by 134 full paper submissions, of which 133 entered the full review process. The number represents a decline of submissions compared to the trend in previous conferences. This might be, together with other factors, due to overlap with other conferences' timeline in the field. Besides this possible outlier, EuroVis 2023 as a whole did see increase in the submissions in other key tracks including short papers and STAR submissions, indicating the community continues to be strong and thriving.

Authors were given the option of anonymous submission, although International Program Committee members have always been able to see the author identities in the submission system. The conference review process this year used again a structured review form, and a formal rebuttal stage. During the first review cycle, each paper received between four and five reviews, two from members of the International Program Committee (IPC). Each paper also received between two and three reviews from external reviewers selected by the IPC members. The four to five reviewers held an online discussion. During the discussion process, the Paper Chairs invited rebuttals from authors, which were made available to all reviewers of each paper. The reviewers for each paper then recommended conditional acceptance or rejection to the Full Papers Program Chairs. Based on the recommendations and responses, the Chairs selected one of three outcomes for each paper: conditional acceptance, a recommendation for fast-track consideration in Computer Graphics Forum, or rejection. 36 papers were conditionally accepted in the first round. These were then revised by the authors and subject to a second round of review. After the second round of review, all these 36 papers were accepted, yielding an acceptance rate of 27%. Six other papers were invited to the fast-track process to undergo revision for consideration in a future issue of Computer Graphics Forum.

The accepted papers form a set of 13 exciting sessions in the full paper program (including the awards papers session) on current topics in Visualization and Visual Analytics. In cooperation with IEEE Transactions on Visualization and Computer Graphics (EiC Han-Wei Shen, AEiC Ross Maciejewski), and with Computer Graphics Forum (EiCs Helwig Hauser and Pierre Alliez), the Papers Co-Chairs invited recently published journal papers which have not yet been presented at conferences. We are also glad that in cooperation with IEEE Computer Graphics and Applications (EiC: André Stork), two sessions on Monday could be formed to present current papers which again, have not yet been presented at conferences. We thank all involved in the invitation process, and especially all authors who were able to accept the invitations, for enriching the EuroVis 2023 program.

The EuroVis conference recognizes the best papers submitted to the conference through Best Paper Awards. This year, the Full Paper Chairs nominated five manuscripts based on reviews, the review scores, the reviewer discussion, and recommendations from the IPC and external reviewers. Then a Best Paper Committee formed by Min Chen, Liz Marai (EuroVis'22 Paper Co-Chair), and Arvind Satyanarayan (EuroVis'22 Honorable Mention Award recipient) made the final selection of a Best Paper and two equal Honorable Mentions. Liz Marai did not participate in the discussion and ranking of one of the papers, which went on to win an Honorable Mention, due to a late conflict of interest with one of its authors.

The Best Paper Award this year goes to “Mini-VLAT: A Short and Effective Measure of Visualization Literacy” by Saugat Pandey and Alvitta Ottley. The Best Paper Committee stated: “This work introduces a shortened version of the Visualization Literacy Assessment Test (VLAT) to make it more practical to administer, and thus increasing its potential for impact, without compromising its usefulness or reliability. The methodology used can serve as an exemplar for future work, drawing on best practices on survey design from psychology and engaging in a multi-phase, iterative process to validate the Mini-VLAT.”

One equal Honorable Mention is awarded to “ChemoGraph: Interactive Visual Exploration of the Chemical Space” by Bharat Kale, Austin Clyde, Maoyuan Sun, Arvind Ramanathan, Rick Stevens, and Michael Papka. The Best Paper Committee stated: “This paper describes a design study to support medicinal chemists in interactively exploring the space of chemical compounds for the purposes of generative drug design. The work offers a mix of strong applications, design, and systems contributions—with a thoughtful design process that yields interesting considerations with regards to data and task abstractions.”

Another equal Honorable Mention is awarded to “A Fully Integrated Pipeline for Visual Carotid Morphology Analysis” by Pepe Eulzer, Fabienne von Deylen, Wei-Chan Hsu, Ralph Wickenhoefer, Carsten Klingner, and Kai Lawonn. We cite again the Best Paper Committee: “This work describes a fully integrated, practical application pipeline for segmenting carotid data and stenosis information from medical scans, to better inform clinical treatment options. The technical solution is quite sophisticated, with careful consideration of design decisions and interesting results. The approach could be extended to other vascular visualization and processing tasks.”

In recognition of the importance of the review process, this year the Full Paper Chairs again recognized the best EuroVis full paper reviewers, through a Best Reviewer Award. The Full Paper Chairs analyzed all the reviews submitted to the Full Papers program (3-4 reviews per reviewer candidate, 133 submissions entered in the review process) as well as the reviewer discussion for each submission. They then compiled a preliminary list of about 20 outstanding reviewers, using as criteria the quality of submitted reviews, and the reviewer participation into paper discussions. The Chairs also considered nominations entered by the reviewer pool. Each Chair did not nominate any of their conflicts of interest. After discussion, the Chairs selected by consensus a subset of five reviewers, then anonymized their corresponding review samples. A Best Reviewer Committee formed by Fabian Beck, Rita Borgo (EuroVis'22 Paper Co-Chair), and Kenneth Moreland (EuroVis'22 Best Reviewer Award recipient) reviewed the anonymized samples, discussed the nominations, and selected a Best Reviewer award. The Best Reviewer award was made to IPC member Kostiantyn Kucher. The committee stated: “We felt the reviewer has consistently provided insightful and constructive feedback. Their reviews have been thorough, well-written, and helpful in substantially improving the quality of submissions. Furthermore, their reviews always had a respectful tone that never became demeaning or accusatory even when delivering criticism.”

We would like to thank everyone who has made the event possible. We thank the authors of all submissions for providing us with such a broad range of exciting work to select from. We thank the International Program Committee for their work in identifying external reviewers and guiding the review process. We thank the reviewers for their work in selecting the papers and providing feedback to authors. We thank the chairs of the other conference tracks for their help in making EuroVis 2023 such a successful event: Short Paper chairs Thomas Hoellt, Wolfgang Aigner, and Bei Wang; STAR chairs Stefan Bruckner, Renata Raidou, and Cagatay Turkey; the Posters Chairs Simone

Lenti, Michael Krone, and Christina Gillmann; the Panels and Tutorials Chairs Hans-Jörg Schulz and Ingrid Hotz, the Workshop Chairs Karsten Rink, Jürgen Bernard, and all the chairs of the co-located workshops; the Student Volunteer Chair Felix Raith, and the Dirk Bartz Prize Chairs Renata Raidou and Torsten Kuhlen. We especially thank Publication Chair Stefanie Behnke for her great work in preparing the publications, and James Stewart for his swift assistance with the review software system. We thank the EuroVis Steering Committee for giving the Paper Chairs their full support and help. We also thank very much the Program Chair Christian Heine for working on the program, the Online Chair Daniel Wiegrefe for organizing the online and video material of the conference, and the Communication Chair Vanessa Kretzschmar for announcing and making aware of the conference in web and social media.

And of course we thank the General Chair Gerik Scheuermann, and Vice Chairs Dirk Zeckzer, Olaf Kolditz, and Mario Hlawitschka, for their efforts in creating the full conference, a highly successful event for researchers, authors, students, all interested and the community at large. Technical conferences, such as EuroVis, serve an important role in bringing the research community together to share ideas. We value the opportunity to share ideas and collegiality.

Eurographics Conference on Visualization (EuroVis) 2023
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Invited Talk: Keynote

The Role of Visualization in Structural Biology and Drug Discovery

Jens Meiler

Abstract

Research in computational structural biology is advancing at a breath-taking pace driven by several developments. Artificial Intelligence-driven algorithms such as AlphaFold give ready access to an accurate three-dimensional structure of every human protein including mutations that cause disease. In silico ultra-large library screening identifies hit compounds that can be the starting point for drug discovery. Protein design algorithms allow for the engineering of therapeutic antibodies and vaccine candidates. These developments depend on efficient visualization of biomolecules and their interactions, a formidable challenge for systems consisting of thousands of atoms with millions of interactions. Highlighting aspects critical for function in detail while simplifying or omitting less important aspects of protein structure is key to many visualization techniques in structural biology. Recent developments in the field will be reviewed accompanied by visualization examples.

Short Biography

Jens Meiler studied Chemistry at Leipzig University in Germany before he obtained his PhD working in the laboratory of Christian Griesinger at the Goethe University in Frankfurt developing new computational methods for biomolecular NMR spectroscopy. In 2001 he moved to Seattle to work with David Baker creating the protein modeling software Rosetta. In 2005 he joined the faculty at Vanderbilt University. In his research, Dr. Meiler fuses computational and experimental efforts to investigate proteins, the fundamental molecules of biology, and their interactions with small molecule substrates, therapeutics, or probes. He develops computational methods with three major ambitions in mind: to enable protein structure elucidation of membrane proteins, design proteins with novel structure and/or function, and understand the relation between chemical structure and biological activity for drug-like small molecules. Jens Meiler received several honors including the Chancellor Faculty Award at Vanderbilt University and the Friedrich-Wilhelm-Bessel Award of the Humboldt Foundation. In January 2020, with an Alexander von Humboldt Professorship, Jens Meiler became director of the newly founded Institute for Drug Discovery at Leipzig University. Simultaneously, he continues in his role as Professor at Vanderbilt University. His research team consists of around 60 undergraduate, graduate, and post-graduate students as well as staff scientists. He co-authored more than 350 peer-reviewed publications (Citations >20 000, H-index >70).

Invited Talk: Capstone

Seeing is Learning in High Dimensions

Alexandru Telea

Abstract

Multidimensional projections (MPs) are one of the techniques of choice for visually exploring large high-dimensional data. In parallel, machine learning (ML) and in particular deep learning applications are one of the most prominent generators of large, high-dimensional, and complex datasets which need visual exploration. In this talk, I will explore the connections, challenges, and potential synergies between these two fields. These involve “seeing to learn”, or how to deploy MP techniques to open the black box of ML models, and “learning to see”, or how to use ML to create better MP techniques for visualizing high-dimensional data.

Specific questions I will cover include selecting suitable MP methods from the wide arena of such available techniques; using ML to create faster and simpler to use MP methods; assessing projections from the novel perspectives of stability and ability to handle time-dependent data; extending the projection metaphor to create dense representations of classifiers; and using projections not only to explain, but also to improve, ML models.

Short Biography

Alexandru Telea is Professor of Visual Data Analytics at the Department of Information and Computing Sciences, Utrecht University. He holds a PhD from Eindhoven University and has been active in the visualization field for over 25 years. He has been the program co-chair, general chair, or steering committee member of several conferences and workshops in visualization, including EuroVis, VISSOFT, SoftVis, and EGPGV. His main research interests cover unifying information visualization and scientific visualization, high-dimensional visualization, and visual analytics for machine learning. He is the author of the textbook “Data Visualization: Principles and Practice” (CRC Press, 2014).