

# Preface

This volume contains the papers presented at GD 2021, the 29th International Symposium on Graph Drawing and Network Visualization, held during September 14–17, 2021, in Tübingen, Germany. Graph drawing is concerned with the geometric representation of graphs and constitutes the algorithmic core of network visualization. Graph drawing and network visualization are motivated by applications where it is crucial to visually analyze and interact with relational datasets. Information about the conference series and past symposia is maintained at <http://www.graphdrawing.org>.

This 2021 conference was held under extraordinary circumstances. After the GD 2020 conference, which sadly had to be held wholly online due to the COVID-19 pandemic, we were delighted to be able to meet our colleagues face-to-face again at a hybrid GD 2021 conference at Universität Tübingen. The credit for this remarkable achievement in such uncertain times goes wholly to Michael A. Bekos and Michael Kaufmann as co-chairs of the Organizing Committee, whose early optimism and determination ensured that the conference went ahead in the form that we all so desired: in-person, with live presentations, poster sessions, and social events. We are much indebted to them.

In effect, the Organizing Committee arranged two conferences, since they were committed to also offering remote attendance, thus making the event accessible to researchers unable to travel to Germany. Remote participation was facilitated through Gather, Zoom, and a live video stream from the conference room in Tübingen. Hybrid conferences may indeed be the way forward in the future – and this Organizing Committee is well aware of the extensive additional effort this model requires.

A total of 70 participants attended the conference in person, with a further 100 registered participants online.

With regards to the program itself, regular papers could be submitted to one of two distinct tracks: Track 1 for papers on combinatorial and algorithmic aspects of graph drawing and Track 2 for papers on experimental, applied, and network visualization aspects. Short papers were given a separate category, which welcomed both theoretical and applied contributions. An additional track was devoted to poster submissions. All the tracks were handled by a single Program Committee. In response to the call for papers, the Program Committee received a total of 74 submissions, consisting of 59 papers (38 in Track 1, 12 in Track 2, and nine in the short paper category) and 15 posters. More than 220 single-blind reviews were provided, with almost a third contributed by external sub-reviewers. After extensive electronic discussions via Easy-Chair, the Program Committee selected 28 papers and 13 posters for inclusion in the scientific program of GD 2021. This resulted in an overall paper acceptance rate of 47% (50% in Track 1, 33% in Track 2, and 56% in the short paper category). Nine of the 30 oral presentations (including two invited talks) were delivered remotely using Zoom; the remaining 21 were delivered on-site. Posters were displayed on-site as well as in Gather.

Authors published an electronic version of their accepted papers on the arXiv e-print repository; a conference index with links to these contributions was made available before the conference.

There were two invited lectures at GD 2021. Kim Marriott from Monash University (Australia) asked “Node Link Diagrams: Are they (actually) useful?”, while Meirav Zehavi from Ben-Gurion University (Israel) discussed “Parameterized Complexity in Graph Drawing.” Abstracts of both invited lectures are included in these proceedings.

The conference gave out best paper awards in Track 1 and Track 2, as well as a best presentation award and a best poster award. The award for the best paper in Track 1 was given to “Edge-Minimum Saturated  $k$ -Planar Drawings” by Steven Chaplick, Fabian Klute, Irene Parada, Jonathan Rollin, and Torsten Ueckerdt, and the award for the best paper in Track 2 was assigned to “A User Study on Hybrid Graph Visualizations” by Emilio Di Giacomo, Walter Didimo, Fabrizio Montecchiani, and Alessandra Tappini. Based on a majority vote of conference participants, the best presentation award was given to Henry Förster for his presentation of the paper “Recognizing and Embedding Simple Optimal 2-Planar Graphs” and the best poster award was given to “The Universe Beyond Planarity” by Michael A. Bekos, Paul Goehring, Michael Kaufmann, and Axel Kuckuk. Many thanks to Springer whose sponsorship funded the prize money for these awards.

A PhD School was held on the two days prior to the conference, attended by 23 participants from five different countries. Four half-day sessions led by five invited lecturers covered both theoretical and practical topics in graph drawing and network visualization, each including a hands-on activity.

As is traditional, the 29th Annual Graph Drawing Contest was held during the conference. The contest was divided into two parts, creative topics and the live challenge. The creative topics task featured two graphs, a Movie Remake graph (modeling remakes of movies by different directors), and an Argumentation Network (a logical reconstruction of an historical scientific debate). The live challenge focused on minimizing the planar polyline edge-length ratio on a fixed grid, with planar undirected inputs. There were two categories: manual and automatic. We thank the Contest Committee, chaired by Philipp Kindermann, for preparing interesting and challenging contest problems. A report about the contest is included in these proceedings.

Many people and organizations contributed to the success of GD 2021. We would like to thank all members of the Program Committee and the external reviewers for carefully reviewing and discussing the submitted papers and posters; this was crucial for putting together a strong and interesting program. Thanks too to all authors who chose GD 2021 as the publication venue for their research.

We are grateful for the support of our “Premium” sponsor yWorks, our “Diamond” sponsor DFG, our “Gold” sponsors Tom Sawyer Software and Universität Tübingen, and our “Bronze” sponsor Springer.

Our special thanks go to all the members of the Organizing Committee based at Universität Tübingen: Michael A. Bekos, Henry Förster, Renate Hallmayer, Michael Kaufmann, Axel Kuckuk, Maximilian Pfister, and Lena Schlipf – they performed a miracle that we did not dare to hope for in early 2021.

The 30th International Symposium on Graph Drawing and Network Visualization (GD 2022) will take place during September 13–16, 2022, in Tokyo, Japan. Reinhard