

Accepted Papers of SoCG 2025

The accepted paper list has now been posted on the conference website:

https://socg25.github.io/socg.html#accepted_list

- Rapid mixing of the flip chain over non-crossing spanning trees**
 Konrad Anand (School of Informatics, University of Edinburgh); Weiming Feng (ETH Zürich); Graham Freifeld, Heng Guo (School of Informatics, University of Edinburgh); Mark Jerrum (Queen Mary, University of London); Jiaheng Wang (University of Regensburg)
- An 11/6-Approximation Algorithm for Vertex Cover on String Graphs**
 Édouard Bonnet (CNRS); Paweł Rzażewski (Warsaw University of Technology)
- On the Twin-Width of Smooth Manifolds**
 Édouard Bonnet (CNRS, ENS de Lyon); Kristóf Huszár (Graz University of Technology)
- Certifying that a knot is composite**
 Alexander He (Oklahoma State University); Eric Sedgwick (DePaul University); Jonathan Spreer (The University of Sydney)
- When alpha-complexes collapse onto codimension-1 submanifolds**
 Dominique Attali (Gipsa lab and CNRS); Mattéo Clémot (LIRIS and CNRS); Bianca Boeira Dornelas (Graz University of Technology - TU Graz); André Lieutier
- Simplification of Trajectory Streams**
 Siu-Wing Cheng, Haoqiang Huang (Hong Kong University of Science and Technology); Le Jiang (University of Science and Technology of China)
- A PTAS for TSP with Neighbourhoods Over Parallel Line Segments**
 Benyamin Ghaseminia, Mohammad R. Salavatipour (University of Alberta)
- A Sparse Multicover Bifiltration of Linear Size**
 Ángel Javier Alonso (Graz University of Technology)
- On Spheres with k Points Inside**
 Herbert Edelsbrunner (Institute of Science and Technology Austria); Alexey Garber (University of Texas Rio Grande Valley); Morteza Saghaian (Institute of Science and Technology Austria)

- On Approximability of ℓ_p^2 Min-Sum Clustering**
 Karthik C. S. (Rutgers University); Euiwoong Lee (University of Michigan); Yuval Rabani (Hebrew University); Chris Schwiegelshohn (Aarhus University); Samson Zhou (Texas A&M University)
- Signotopes with few plus signs**
 Helena Bergold (FU Berlin); Lukas Egeling (ETH Zurich); Hung Hoang (TU Wien)
- Small triangulations of 4-manifolds: Introducing the 4-manifold census**
 Rhuaiddi Antonio Burke, Benjamin Burton (The University of Queensland); Jonathan Spreer (The University of Sydney)
- Recognizing 2-Layer and Outer k-Planar Graphs**
 Yasuaki Kobayashi (Hokkaido University); Yuto Okada (Nagoya University); Alexander Wolff (Universität Würzburg)
- A Minor-Testing Approach for Coordinated Motion Planning with Sliding Robots**
 Eduard Eiben (Royal Holloway, University of London); Robert Ganian (TU Wien); Iyad Kanj (DePaul University); M. S. Ramanujan (University of Warwick)
- Reconfiguration of unit squares and disks: PSPACE-hardness in simple settings**
 Mikkel Abrahamsen (University of Copenhagen); Kevin Buchin (TU Dortmund); Maike Buchin (Ruhr University Bochum); Linda Kleist (Universität Potsdam); Maarten Löffler (Utrecht University); Lena Schlipf (Universität Tuebingen); Andre Schulz (University of Hagen); Jack Stade (University of Copenhagen)
- Snap Rounding: A Cautionary Tale**
 John Hershberger (Siemens)
- A Linear Time Algorithm for the Maximum Overlap of Two Convex Polygons Under Translation**
 Timothy M. Chan (UIUC); Isaac M. Hair (UCSB)
- Banana Trees for the Persistence in Time Series Experimentally**

Lara Ost (University of Vienna); Sebastiano Cultrera di Montesano (Broad Institute of MIT and Harvard); Herbert Edelsbrunner (Institute of Science and Technology Austria)

- **Finding a Shortest Curve that Separates Few Objects from Many**
Therese Biedl (University of Waterloo); Éric Colin de Verdière (CNRS, Laboratoire d'Informatique Gaspard Monge, Marne-la-Vallée); Fabrizio Frati (Università di Roma Tre); Anna Lubiw (University of Waterloo); Günter Rote (Freie Universität Berlin)
- **Uniform Bounds on Product Sylvester-Gallai Configurations**
Abhibhav Garg, Rafael Oliveira, Akash Kumar Sengupta (University of Waterloo)
- **Incremental Planar Nearest Neighbor Queries with Optimal Query Time**
John Iacono (Université libre de Bruxelles); Yakov Nekrich (Michigan Technological University)
- **Hard diagrams of split links**
Corentin Lunel (Inria d'Université Côte d'Azur); Arnaud de Mesmay (CNRS, LIGM, Université Gustave Eiffel); Jonathan Spreer (The University of Sydney)
- **The Fréchet Distance Unleashed: Approximating a Dog with a Frog**
Sariel Har-Peled (University of Illinois at Urbana-Champaign); Benjamin Raichel (University of Texas at Dallas); Eliot Robson (University of Illinois Urbana-Champaign)
- **Tracking the Persistence of Harmonic Chains: Barcode and Stability**
Tao Hou (University of Oregon); Salman Parsa (DePaul University); Bei Wang (University of Utah)
- **Tiling with Three Polygons is Undecidable**
Erik Demaine (MIT); Stefan Langerman (Université libre de Bruxelles (ULB))
- **On Zarankiewicz's Problem for Intersection Hypergraphs of Geometric Objects**
Timothy M. Chan (UIUC); Chaya Keller (Ariel University); Shakhar Smorodinsky (Ben Gurion University of the NEGEV)

- Steinhaus Filtration and Stable Paths in the Mapper**
 Dustin L Arendt (Pacific Northwest National Laboratory); Matthew Broussard (TD Bank USA); Bala Krishnamoorthy (Washington State University); Nathaniel Saul (Stripe USA); Amber Thrall (Washington State University)
- The Erdős-Szekeres Conjecture revisited**
 Martin Balko (Charles University); Jineon Baek (University of Michigan)
- Lipschitz Decompositions of Finite ℓ_p Metrics**
 Robert Krauthgamer, Nir Petruschka (Weizmann Institute of Science)
- Single-Source Shortest Path Problem in Weighted Disk Graphs**
 Shinwoo An, Eunjin Oh (POSTECH); Jie Xue (NYU Shanghai)
- On Sparse Covers of Minor Free Graphs, Low Dimensional Metric Embeddings, and other applications**
 Arnold Filtser (Bar-Ilan University)
- Levels in arrangements: linear relations, the g -matrix, and applications to crossing numbers**
 Elizaveta Streltsova, Uli Wagner (Institute of Science and Technology Austria (ISTA))
- When Distances Lie: Euclidean Embeddings in the Presence of Outliers and Distance Violations**
 Matthias Bentert, Fedor Fomin, Petr A. Golovach (University of Bergen); M. S. Ramanujan (University of Warwick); Saket Saurabh (IMSc)
- Range Counting Oracles for Geometric Problems**
 Anne Driemel (University of Bonn); Morteza Monemizadeh (Eindhoven University of Technology); Eunjin Oh (POSTECH); Frank Staals (Utrecht University); David P. Woodruff (Carnegie Mellon University)
- Sparsification of the Generalized Persistence Diagrams for Scalability through Gradient Descent**
 Mathieu Carrière (Centre Inria d'Université Côte d'Azur); Seunghyun Kim, Woojin Kim (KAIST)

- **Super-Polynomial Growth of the Generalized Persistence Diagram**
Donghan Kim, Woojin Kim, Wonjun Lee (KAIST)
- **The maximum number of digons formed by pairwise intersecting pseudocircles**
Eyal Ackerman (University of Haifa); Gábor Damásdi, Balázs Keszegh (ELTE, Alfréd Rényi Institute of Mathematics); Rom Pinchasi (Technion - Israel Institute of Technology, EPFL); Rebeka Raffay (EPFL)
- **Higher-Order Color Voronoi Diagrams and the Colorful Clarkson-Shor Framework**
Sang Won Bae (Kyonggi University); Nicolau Oliver (Università della Svizzera italiana,); Evanthia Papadopoulou (Università della Svizzera italiana)
- **The Point-Boundary Art Gallery Problem is $\exists R$ -hard**
Jack Stade (University of Copenhagen)
- **Optimal Motion Planning for Two Square Robots in a Rectilinear Environment**
Pankaj K Agarwal (Duke University); Mark de Berg (Department of Mathematics and Computer Science, Eindhoven University of Technology, Eindhoven, The Netherlands); Benjamin Holmgren, Alex Steiger (Department of Computer Science, Duke University); Martijn Struijs (TU Eindhoven)
- **k -dimensional transversals for fat convex sets**
Attila Jung, Dömötör Pálvölgyi (ELTE Eötvös Loránd University)
- **A Subquadratic Algorithm for Computing the L_1 -distance between Two Terrains**
Pankaj K Agarwal (Duke University); Boris Aronov (New York University); Guillaume Moroz (Inria)
- **Sparse Bounded Hop-Spanners for Geometric Intersection Graphs**
Timothy M. Chan, Zhengcheng Huang (University of Illinois at Urbana-Champaign); Shakhar Smorodinsky (Ben Gurion University of the

NEGEV); Csaba D. Tóth (California State University Northridge); Sujoy Bhore (Indian Institute of Technology Bombay)

- **Computing Geomorphologically Salient Networks via Discrete Morse Theory**

Tim Ophelders (Utrecht University and TU Eindhoven); Anna Schenfisch, Willem Sonke, Bettina Speckmann (TU Eindhoven)

- **An algorithm for Tambara-Yamagami quantum invariants of 3-manifolds, parameterized by the first Betti number**

Colleen Delaney (Purdue University); Clément Maria (INRIA - Université Côte d'Azur); Eric Samperton (Purdue University)

- **Persistent (Co)Homology in Matrix Multiplication Time**

Dmitriy Morozov (Lawrence Berkeley National Laboratory); Primož Skraba (Queen Mary University of London)

- **Embedding Graphs as Euclidean kNN-Graphs**

Thomas Schibler (University of California, Santa Barbara); Subhash Suri (University of California, Santa Barbara); Jie Xue (NYU Shanghai, China)

- **Immersions and Albertson's conjecture**

Jacob Fox (Stanford University); Janos Pach (EPFL, Lausanne and Renyi Institute); Andrew Suk (UCSD)

- **A note on the no- $(d+2)$ -on-a-sphere problem**

Andrew Suk (UCSD); Ethan White (UIUC)

- **Improved Approximation Algorithms for Three-Dimensional Knapsack**

Klaus Jansen (Kiel University); Debajyoti Kar, Arindam Khan, K. V. N. Sreenivas (Indian Institute of Science, Bengaluru); Malte Tutas (Kiel University)

- **Computing Betti tables and minimal presentations of zero-dimensional persistent homology**

Luis Scoccola (Centre de Recherches Mathématiques); Dmitriy Morozov (Lawrence Berkeley National Laboratory)

- **Apex Representatives**

Tamal K. Dey (Purdue University); Tao Hou (University of Oregon); Dmitriy Morozov (Lawrence Berkeley National Laboratory)

- **Shelling and Sinking Graphs on the Sphere**

Jeff Erickson, Christian Howard (University of Illinois Urbana-Champaign)

- **Non-Euclidean Erdős–Anning Theorems**

David Eppstein (Univ. of California, Irvine)

- **Polychromatic Coloring of Tuples in Hypergraphs**

Ahmad Biniaz (University of Windsor); Jean-Lou De Carufel (University of Ottawa); Anil Maheshwari, Michiel Smid (Carleton University); Shakhar Smorodinsky (Ben Gurion University of the NEGEV); Milos Stojakovic (University of Novi Sad)

- **Polynomial-Time Algorithms for Contiguous Art Gallery and Related Problems**

Ahmad Biniaz (University of Windsor); Anil Maheshwari (Carleton University); Magnus Christian Ring Merrild (Aarhus University); Joseph Mitchell (Stony Brook University); Saeed Odak (University of Ottawa); Valentin Polishchuk (Linköping University); Eliot W. Robson (University of Illinois at Urbana-Champaign); Casper Moldrup Rysgaard (Aarhus University); Jens Kristian Refsgaard Schou (Aarhus University); Tom Shermer (Simon Fraser University); Rolf Svenning (Aarhus University); Jack Spalding-Jamieson (Independent); Da Wei Zheng (University of Illinois at Urbana-Champaign)

- **Dynamic Maximum Depth of Geometric Objects**

Subhash Suri (University of California, Santa Barbara); Jie Xue, Xiongxin Yang, Jiumu Zhu (New York University Shanghai)

- **Sublinear Data Structure for Nearest Neighbor in Ultra High Dimensions**

Zihang Wu, Martin G. Herold, Danupon Nanongkai (Max Planck Institute for Informatics, Saarland Informatics Campus); Joachim Spoerhase (University of Liverpool); Nithin Varma (University of Cologne)

- **Structure and Independence in Hyperbolic Uniform Disk Graphs**

Thomas Bläsius, Jean-Pierre von der Heydt (Karlsruhe Institute of Technology);

Sándor Kisfaludi-Bak (Aalto University); Marcus Wilhelm (Karlsruhe Institute of Technology); Geert van Wordragen (Aalto University)

- **Extremal Betti Numbers and Persistence in Flag Complexes**

Magnus B. Botnan, Lies Beers (Vrije Universiteit Amsterdam)

- **Efficient Greedy Discrete Subtrajectory Clustering**

Ivor van der Hoog (Technical University of Denmark); Lara Ost (University of Vienna); Eva Rotenberg (Technical University of Denmark); Daniel Rutschmann (Technical University of Denmark)

- **Geometric Realizations of Dichotomous Ordinal Graphs**

Michael Hoffmann (Department of Computer Science, ETH Zürich, Switzerland); Patrizio Angelini (John Cabot University); Sabine Cornelsen (University of Konstanz); Carolina Haase (Trier University); Eleni Katsanou (NTU Athens); Fabrizio Montecchiani (University of Perugia); Raphael Steiner (ETH Zurich); Antonios Symvonis (NTU Athens)

- **Exact Algorithms for Minimum Dilation Triangulation**

Sándor Fekete, Phillip Keldenich, Michael Perk (TU Braunschweig)

- **Approximating Klee's Measure Problem and a Lower Bound for Union Volume Estimation**

Karl Bringmann (Saarland University and Max Planck Institute for Informatics); Kasper Green Larsen (Aarhus University, Denmark); André Nusser (CNRS, Inria, Université Côte d'Azur, France); Eva Rotenberg (Technical University of Denmark, DTU); Yanheng Wang (Saarland University and Max Planck Institute for Informatics)

- **Transforming Dogs on the Line: On the Fréchet Distance Under Translation or Scaling in 1D**

Lotte Blank, Jacobus Conradi, Anne Driemel, Benedikt Kolbe (University of Bonn); André Nusser (CNRS, Inria, Université Côte d'Azur); Marena Richter (University of Bonn)

- **Computing Oriented Spanners and their Dilation**

Antonia Kalb, Kevin Buchin (TU Dortmund); Anil Maheshwari (Carleton

University); Saeed Odak (University of Ottawa); Carolin Rehs (TU Dortmund); Michiel Smid (Carleton University); Sampson Wong (University of Copenhagen)

- **Nearest Neighbor Searching in a Dynamic Simple Polygon**
Sarita de Berg (Utrecht Utrecht); Frank Staals (Utrecht University)
- **The Maximum Clique Problem in a Disk Graph Made Easy**
J. Mark Keil, Debajyoti Mondal (University of Saskatchewan)
- **Computation of toroidal Schnyder woods made simple and fast: from theory to practice**
Luca Castelli Aleardi (LIX, Ecole Polytechnique); Eric Fusy (Laboratoire d'Informatique Gaspard Monge); Jyh-Chwen KO, Razvan Stefan Puscasu (LIX, Ecole Polytechnique)
- **Higher Order Bipartiteness vs Bi-Partitioning in Simplicial Complexes**
Marzieh Eidi (Max Planck Institute for Mathematics in the Sciences); Sayan Mukherjee (MPI MIS, Duke University)
- **Faster Algorithms for Reverse Shortest Path in Unit-Disk Graphs and Related Geometric Optimization Problems: Improving the Shrink-and-Bifurcate Technique**
Timothy M. Chan (UIUC); Zhengcheng Huang (University of Illinois at Urbana-Champaign)
- **A Theory of Sub-Barcodes**
Oliver Chubet (North Carolina State University); Kirk Gardner (AFRL); Donald Sheehy (North Carolina State University)
- **Geometric spanners of bounded tree-width**
Kevin Buchin, Carolin Rehs, Torben Scheele (TU Dortmund)
- **Convexity Helps Iterated Search in 3D**
Peyman Afshani (Aarhus University); Frank Staals (Utrecht University); Yakov Nekrich (Michigan Technological University)

- **Geometric Bipartite Matching Based Exact Algorithms for Server Problems**
Sharath Raghvendra (North Carolina State University); Pouyan Shirzadian (Virginia Tech); Rachita Sowle (Virginia Commonwealth University)
- **Quantum Combine and Conquer and Its Applications to Sublinear Quantum Convex Hull and Maxima Set Construction**
Shion Fukuzawa, Michael Goodrich, Sandy Irani (University of California, Irvine)
- **Decomposing Multiparameter Persistence Modules**
Tamal K. Dey (Purdue University); Jan Jendrysiak, Michael Kerber (TU Graz)
- **Strongly sublinear separators and bounded asymptotic dimension for sphere intersection graphs**
James Davies (University of Cambridge); Agelos Georgakopoulos (University of Warwick); Meike Hatzel (Institute of Basic Science); Rose McCarty (Georgia Institute of Technology)