

Program

Monday, 06. June 2022




Time	
18:00–20:00	Welcome Reception (Lobby, Institut für Informatik)

Tuesday, 07. June 2022

Time		
08:50–09:00	Introductory Remarks (Goethe-Saal, Harnack-Haus)	
09:00–09:30	SoCG Best Paper (Goethe-Saal, Harnack-Haus) Chair: Xavier Goaoc	
	<u>Daniel Rutschmann</u> and Manuel Wettstein Chains, Koch Chains, and Point Sets with many Triangulations	
09:30–10:30	Fast-Forward Session for CG:YRF and SoCG student talks (Goethe-Saal, Harnack-Haus)	
10:30–11:00	Coffee Break (Lobby, Harnack-Haus)	
11:00–12:30	SoCG Session 1a (Goethe-Saal, Harnack-Haus) Chair: Marc van Kreveld	SoCG Session 1b (Hahn-Hörsaal, Harnack-Haus) Chair: Carola Wenk
11:00–11:22	👤 Neeraj Kumar, Daniel Lokshtanov, Saket Saurabh, Subhash Suri and <u>Jie Xue</u> Point Separation and Obstacle Removal by Finding and Hitting Odd Cycles	👤 Tamal Dey, Michał Lipiński, Marian Mrozek and <u>Ryan Slechta</u> Tracking Dynamical Features via Continuation and Persistence
11:22–11:44	👤 Haim Kaplan, Alexander Kauer, Katharina Klost, <u>Kristin Knorr</u> , Wolfgang Mulzer, Liam Roditty and Paul Seiferth Dynamic Connectivity in Disk Graphs	👤 Ulrich Bauer and <u>Fabian Roll</u> Gromov hyperbolicity, geodesic defect, and apparent pairs in Rips filtrations

Time		
11:44–12:06	👤 Karl Bringmann, Sándor Kisfaludi-Bak, Marvin Künnemann, André Nusser and <u>Zahra Parsaeian</u> Towards sub-quadratic diameter computation in geometric intersection graphs	👤 Don Sheehy and <u>Siddharth Sheth</u> Nearly-Doubling Spaces of Persistence Diagrams
12:06–12:28	👤 <u>Jonathan Conroy</u> and Csaba Toth Hop-Spanners for Geometric Intersection Graphs	👤 Francis Lazarus and <u>Florent Tallier</u> A Universal Triangulation for Flat Tori
12:30–14:00	Lunch (Restaurant, Harnack-Haus)	
14:00–15:30	SoCG Session 2a (Goethe-Saal, Harnack-Haus) Chair: Stefan Huber	SoCG Session 2b (Hahn-Hörsaal, Harnack-Haus) Chair: Sergio Cabello
14:00–14:22	👤 <u>Nicolas Grelier</u> Hardness and Approximation of Minimum Convex Partition	👤 <u>Cameron Rudd</u> , Nathan Dunfield and Malik Obeidin Computing a link diagram given its exterior
14:22–14:44	👤👤 <u>Lily Chung</u> , Erik D. Demaine, Dylan Hendrickson and Victor Luo Flat Folding an Unassigned Single-Vertex Complex (Plane Graph with Specified Edge Lengths) without Flat Angles	👤 <u>Mitchell Black</u> , Nello Blaser, Amir Nayyeri and <u>Erlend Raa Vågset</u> ETH-tight algorithms for finding surfaces in simplicial complexes of bounded treewidth
14:44–15:06	👤 Everett Yang and <u>Sariel Har-Peled</u> Approximation Algorithms for Maximum Matching in Disk Intersection Graphs	👤 <u>Niloufar Fuladi</u> , Alfredo Hubbard and Arnaud de Mesmay Short topological decompositions of non-orientable surfaces
15:06–15:28	👤 <u>Wai Ming Tai</u> Optimal Coreset for Gaussian Kernel Density Estimation	👤 <u>Jean Chartier</u> and Arnaud de Mesmay Finding weakly simple closed quasigeodesics on polyhedral spheres
15:30–16:00	Coffee Break (Lobby, Harnack-Haus)	


Time			
16:00–18:30	CG:YRF		10th Annual Minisymposium on Computational Topology–Session 1 (Meitner-Saal 1, Harnack-Haus)
16:00–17:15	CG:YRF Session 1a (Goethe-Saal, Harnack-Haus) Chair: Anne Driemel	CG:YRF Session 1b (Hahn-Hörsaal, Harnack-Haus) Chair: André Nusser	<ul style="list-style-type: none"> 16:00–16:05: Welcoming 16:05–16:40: Giovanni Bocchi Group Equivariant Non-Expansive Operators: a novel approach to deep learning grounded in Topological Data Analysis 16:40–17:05:  Kathryn Lindsey Feedforward ReLU neural networks and piecewise-linear geometry
16:00–16:15	 Ulrich Bauer, Talha Bin Masood, Barbara Giunti, Guillaume Houry, Michael Kerber and Abhishek Rathod Sparsity and output-sensitivity in persistence computation	Sarita de Berg , Marc van Kreveld and Frank Staals The Complexity of Geodesic Spanners	
16:15–16:30	Ángel Javier Alonso , Michael Kerber and Siddharth Pritam Reducing Multi-Parameter Flag Filtrations via Edge Collapses	Prosenjit Bose, Guillermo Esteban , David Orden and Rodrigo Silveira On approximating shortest paths in weighted hexagonal tessellations	
16:30–16:45	David Loiseau , Andrew Blumberg and Mathieu Carrière An Approximation of Multiparameter Persistence Modules	Erin Chambers, Brittany Terese Fasy, Benjamin Holmgren , Sushovan Majhi and Carola Wenk Path-Connectivity of Fréchet Spaces of Graphs	
16:45–17:00	Wojciech Chachólski, René Corbet and Anna-Laura Sattelberger The Shift-Dimension of Multipersistence Modules	Reilly Browne and Eric Chiu Collapsing the Hidden-Set Convex-Cover Inequality	
17:00–17:15	 Oliver Chubet A Maximum Subbarcode Matching Algorithm	Matthijs Ebbens and Francis Lazarus Computing the length spectrum of combinatorial graphs on the torus	

Time			
17:15–17:30	Break		
17:30–18:30	CG:YRF Session 2a (Goethe-Saal, Harnack-Haus) Chair: Zuzana Patáková	CG:YRF Session 2b (Hahn-Hörsaal, Harnack-Haus) Chair: Jeff Phillips	10th Annual Minisymposium on Computational Topology–Session 1 (Meitner-Saal 1, Harnack-Haus)
17:30–17:45	 Reza Bigdeli and Anna Lubiw Forbidding Edges between Points in the Plane to Disconnect the Triangulation Flip Graph	Brendan Mallery , Adélie Garin and Justin Curry Lattice Theoretic Perspectives on the Persistence Map	<ul style="list-style-type: none"> 17:30–18:05: Vitaliy Kurlin Persistence vs newer isometry invariants of point sets 18:05–18:30:  Yusu Wang Persistent Laplacian: properties and algorithms
17:45–18:00	Luis Crespo Ruiz and Francisco Santos The tropical variety of antisymmetric matrices	Florian Russold Persistent sheaf cohomology	
18:00–18:15	 Tatyana Zaitseva Self-affine tilings, multivariate B-splines and subdivision schemes	Benjamin Brück and Adélie Garin Stratifying the space of barcodes using Coxeter complexes	
18:15–18:30	Daniel W. Cranston, Jiayi Nie, Jacques Verstraete and Alexandra Wesolek On Asymptotic Packing of Geometric Graphs		

Wednesday, 08. June 2022





Time		
09:00–10:30	SoCG Session 3a (Goethe-Saal, Harnack-Haus) Chair: Yakov Nekrich	SoCG Session 3b (Hahn-Hörsaal, Harnack-Haus) Chair: Sang Won Bae
09:00–09:22	🎓 Oswin Aichholzer, Johannes Obenaus , Joachim Orthaber , Rosna Paul, Patrick Schnider, Raphael Steiner, Tim Taubner and Birgit Vogtenhuber Edge Partitions of Complete Geometric Graphs	Håvard Bakke Bjerkevik Tighter bounds for reconstruction from ϵ-samples
09:22–09:44	🎓 Gábor Damásdi and Dömötör Pálvölgyi Three-chromatic geometric hypergraphs	Dominique Attali and Andre Lieutier Delaunay-like triangulation of smooth orientable submanifolds by least L1-norm minimization
09:44–10:06	James Davies, Chaya Keller, Linda Kleist , Shakhbar Smorodinsky and Bartosz Walczak A solution to Ringel's circle problem	🎓 Gilles Bonnet, Daniel Dadush, Uri Grupel, Sophie Huiberts and Galyna Livshyts Asymptotic Bounds on the Combinatorial Diameter of Random Polytopes
10:06–10:28	🎓 Ahmad Biniaz Acute Tours in the Plane	🎓 Anna Arutyunova , Anne Driemel, Jan-Henrik Haunert, Herman Haverkort, Jürgen Kusche, Elmar Langetepe, Philip Mayer , Petra Mutzel and Heiko Röglin Minimum-Error Triangulations for Sea Surface Reconstruction
10:30–11:00	Coffee Break (Lobby, Harnack-Haus)	
11:00–12:30	SoCG Session 4a (Goethe-Saal, Harnack-Haus) Chair: Marc van Kreveld	SoCG Session 4b (Hahn-Hörsaal, Harnack-Haus) Chair: Sang Won Bae
11:00–11:22	🎓 Pankaj Agarwal, Boris Aronov, Esther Ezra , Matthew Katz and Micha Sharir Arc-Intersection Queries Amid Triangles in Three Dimensions and Related Problems	🎓 Oswin Aichholzer, Alfredo Garcia, Javier Tejel, Birgit Vogtenhuber and Alexandra Weinberger Twisted Ways to Find Plane Structures in Simple Drawings of Complete Graphs
11:22–11:44	🎓 Hung Le, Lazar Milenković and Shay Solomon Sparse Euclidean Spanners with Tiny Diameter: A Tight Lower Bound	🎓 Thekla Hamm and Petr Hliněný Parameterised Partially-Predrawn Crossing Number

Time			
11:44–12:06	🎓 Mincheol Kim, Chanyang Seo, Jaehoon Ahn and Hee-Kap Ahn Farthest-point Voronoi diagrams in the presence of rectangular obstacles	Steven Chaplick, Emilio Di Giacomo, Fabrizio Frati, Robert Ganian, Chrysanthi N. Raftopoulou and Kirill Simonov Parameterized Algorithms for Upward Planarity	
12:06–12:28	🎓 Peyman Afshani and Pingan Cheng On Semialgebraic Range Reporting	Sayan Bandyopadhyay, William Lochet , Daniel Lokshtanov, Saket Saurabh and Jie Xue True Contraction Decomposition and Almost ETH-Tight Bipartization for Unit-Disk Graphs	
12:30–14:00	Lunch (Restaurant, Harnack-Haus)		
14:00–15:00	Invited Talk (Goethe-Saal, Harnack-Haus) Chair: Michael Kerber		
	Heather Harrington Computational geometry and topology for spatial structures arising in biology		
15:00–15:30	Coffee Break (Lobby, Harnack-Haus)		
15:30–17:00	CG:YRF Session 3a (Goethe-Saal, Harnack-Haus) Chair: Sergio Cabello	CG:YRF Session 3b (Hahn-Hörsaal, Harnack-Haus) Chair: Monique Teillaud	10th Annual Minisymposium on Computational Topology–Session 2 (Meitner-Saal 1, Harnack-Haus)
15:30–15:47	🎓 Alejandro Flores-Velazco Improved Search of Relevant Points for Nearest-Neighbor Classification	Kristóf Huszár and Jonathan Spreer On the Width of Complicated JSJ Decompositions	<ul style="list-style-type: none"> 15:30–15:35: Welcoming 15:35–16:10: Stefania Ebli Morse-theoretic signal compression and reconstruction 16:10–16:45: Mustafa Hajij Higher-Order Attention Networks
15:47–16:04	Thijs van der Horst , Maarten Löffler and Frank Staals Chromatic k-Nearest Neighbor Queries	Manuel Radons Edge-unfolding nested prisms	
16:04–16:21	Tzvika Geft , Dan Halperin and Yonatan Nakar Tractability Frontiers in Multi-Robot Coordination and Geometric Reconfiguration	Mara Belotti , Michael Joswig and Marta Panizzut Algebraic Degrees of 3-Dimensional Polytopes	

Time			
16:21– 16:38	 Sarah Percival An Efficient Algorithm for the Computation of Reeb Spaces from Roadmaps	Hana Dal Poz Kourimska and Mathijs Wintraecken Stability of circumcentres for small metric perturbations of spaces of constant curvature	◦ 16:45– 17:00: Discussion and closing
16:38– 16:55	Erin Chambers, Kathleen Kramer and David Letscher The Edit Distance for Smoothings of Reeb Graphs	Vadim Lebovici Euler-Fourier transform of constructible functions	
17:00– 18:00	Discussion Forum (Goethe-Saal, Harnack-Haus) Chair:		
18:30– 22:30	Conference Dinner (Restaurant Alter Krug)		

Thursday, 09. June 2022

Time		
09:00– 10:30	SoCG Session 5a (Goethe-Saal, Harnack-Haus) Chair: Yakov Nekrich	SoCG Session 5b (Hahn-Hörsaal, Harnack-Haus) Chair: Michael Kerber
09:00– 09:22	 Paul Jungeblut , Linda Kleist and Tillmann Miltzow The Complexity of the Hausdorff Distance	Tamal K. Dey, Woojin Kim and Facundo Mémoli Computing Generalized Rank invariant for 2-Parameter Persistence Modules via Zigzag Persistence and its Applications
09:22– 09:44	Anne Driemel, Ivor van der Hoog and Eva Rotenberg On the Discrete Fréchet Distance in a Graph	Magnus Bakke Botnan , Steffen Oppermann and Steve Oudot Signed Barcodes for Multi-Parameter Persistence via Rank Decompositions
09:44– 10:06	 Kevin Buchin, André Nusser and Sampson Wong Computing Continuous Dynamic Time Warping of Time Series in Polynomial Time	Alexander Rolle The degree-Rips complexes of an annulus with outliers
10:06– 10:28	 Karl Bringmann, Sándor Kisfaludi-Bak, Marvin Künnemann, Dániel Marx and André Nusser Dynamic Time Warping Under Translation: Approximation Guided by Space-Filling Curves	 Marco Contessoto, Facundo Mémoli, Anastasios Stefanou and Ling Zhou Persistent cup-length
10:30– 11:00	Coffee Break (Lobby, Harnack-Haus)	
11:00– 12:00	Invited Talk (Goethe-Saal, Harnack-Haus) Chair: Xavier Goaoc	
	Hannah Bast Efficient Querying of Large-Scale Geodata	
12:00– 13:30	Lunch (Restaurant, Harnack-Haus)	

Time		
13:30– 15:00	SoCG Session 6a (Goethe-Saal, Harnack-Haus) Chair: Jeff Phillips	SoCG Session 6b (Hahn-Hörsaal, Harnack-Haus) Chair: Günter Rote
13:30– 13:52	Yair Bartal, Ora Nova Fandina and Kasper Green Larsen Optimality of the Johnson-Lindenstrauss Dimensionality Reduction for Practical Measures	 Andrew Suk and Ji Zeng A positive fraction Erdős-Szekeres theorem and its applications
13:52– 14:14	 Alexandros Eskenazis ϵ-isometric dimension reduction for incompressible subsets of ℓ_p	Martin Balko, Manfred Scheucher and Pavel Valtr Erdős--Szekeres-type problems in the real projective plane
14:14– 14:36	 Rajesh Chitnis and Nitin Saurabh Tight Lower Bounds for Approximate & Exact k-Center in \mathbb{R}^d	Janos Pach, Gabor Tardos and Geza Toth Disjointness graphs of short polygonal chains
14:36– 14:58	 Chaya Keller and Micha A. Perles An $(\aleph_0, k+2)$-Theorem for k-Transversals	Sergio Cabello, Michael Hoffmann, Katharina Klost , Wolfgang Mulzer and Josef Tkadlec Long plane trees
15:00– 15:30	Coffee Break (Lobby, Harnack-Haus)	
15:30– 16:30	CG:SHOP (Goethe-Saal, Harnack-Haus) Chair: Sándor Fekete	
	<ul style="list-style-type: none"> ◦ Sándor Fekete Welcome and Overview ◦ Dominik Krupke and Phillip Keldenich Technical Comments ◦ André Schidler SAT-based local search for plane subgraph partitions ◦ Florian Fontan, Pascal Lafourcade, Luc Libralesso and Benjamin Momège Local search with weighting schemes for the CG:SHOP 2022 competition ◦ Jack Spalding-Jamieson, Brandon Zhang and Da Wei Zheng Conflict-based local search for minimum partition into plane subgraphs ◦ Loïc Crombez, Guilherme Dias da Fonseca, Yan Gerard and Aido Gonzalez-Lorenzo Shadoks approach to minimum partition into plane subgraphs ◦ Questions and Discussion ◦ Award Ceremony ◦ Outlook 	

Time		
16:30– 18:00	CG:MME (Goethe-Saal, Harnack-Haus) Chair: Aaron T. Becker	
16:30– 16:45	Julien Bourgeois, Sándor Fekete, Ramin Kosfeld, Peter Kramer, Benoît Piranda, Christian Rieck and Christian Scheffer Space Ants: Episode II – Coordinating Connected Catoms	
16:45– 17:00	Willem Sonke and Jules Wulms An Interactive Framework for Reconfiguration in the Sliding Square Model	
17:00– 17:15	Ioannis Mantas, Evanthia Papadopoulou, Martin Suderland and Chee Yap Subdivision methods for sum-of-distances problems: Fermat point, n-ellipse and min-sum cluster Voronoi diagram	
17:15– 17:30	Anirban Ghosh, Fnu Shariful and David Wisnosky Visualizing WSPDs and their applications	
17:30– 17:45	Erin Chambers, Christopher Fillmore, Elizabeth Stephenson and Mathijs Wintraecken A cautionary tale: burning the medial axis is unstable	
17:45– 18:00	Satyan Devadoss, Matthew Harvey and Sam Zhang Visualizing and unfolding nets of 4-polytopes	
18:30– 20:00	Business Meeting (Goethe-Saal, Harnack-Haus) Chair: Michael Hoffmann	

Friday, 10. June 2022

Time		
09:00–10:30	SoCG Session 7a (Goethe-Saal, Harnack-Haus) Chair: Stefan Huber	SoCG Session 7b (Hahn-Hörsaal, Harnack-Haus) Chair: Xavier Goaoc
09:00–09:22	Robert Cardona, Justin Curry , Tung Lam and Michael Lesnick The Universal ℓ^p-Metric on Merge Trees	Zdenek Dvorak , Jakub Pekarek, Torsten Ueckerdt and Yelena Yuditsky Weak Coloring Numbers of Intersection Graphs
09:22–09:44	Fan Wang, Hubert Wagner and Chao Chen GPU Computation of the Euler Characteristic Curve for Imaging Data	Shir Peleg and Amir Shpilka Robust Sylvester-Gallai type theorem for quadratic polynomials <i>and</i> Rafael Mendes de Oliveira , Akash Sengupta and Abhibhav Garg Robust Radical Sylvester-Gallai Theorem for Quadratics
09:44–10:06	Ulrich Bauer, Håvard Bjerkevik and Benedikt Fluhr Quasi-universality of Reeb graph distances	Zuzana Patáková and Micha Sharir Covering points by hyperplanes and related problems
10:06–10:28	Yitzchak Solomon , Alexander Wagner and Paul Bendich From Geometry to Topology: Inverse Theorems for Distributed Persistence	Zdenek Dvorak , Daniel Gonçalves, Abhiruk Lahiri, Jane Tan and Torsten Ueckerdt On comparable box dimension
10:30–11:00	Coffee Break (Lobby, Harnack-Haus)	
11:00–12:00	SoCG Session 8a (Goethe-Saal, Harnack-Haus) Chair: Carola Wenk	SoCG Session 8b (Hahn-Hörsaal, Harnack-Haus) Chair: David Kirkpatrick
11:00–11:20	Marc Glisse and Siddharth Pritam Swap, Shift and Trim to Edge Collapse a filtration	Bahareh Banyassady, Mark de Berg, Karl Bringmann, Kevin Buchin, Henning Fernau, Dan Halperin, Irina Kostitsyna , Yoshio Okamoto and Stijn Slot Unlabeled Multi-Robot Motion Planning with Tighter Separation Bounds

Time			
11:20–11:40	Erin Chambers, Salman Parsa and Hannah Schreiber On Complexity of Computing Bottleneck and Lexicographic Optimal Cycles in a Homology Class	Peyman Afshani , Mark de Berg, Kevin Buchin, Jie Gao, Maarten Löffler, Amir Nayyeri, Benjamin Raichel, Rik Sarkar, Haotian Wang and Hao-Tsung Yang On Cyclic Solutions to the Min-Max Latency Multi-Robot Patrolling Problem	
11:40–12:00	Salman Parsa and Tim Ophelders Minimum Height Drawings of Ordered Trees in Polynomial Time: Homotopy Height of Tree Duals	Anders Aamand, Mikkel Abrahamsen , Thomas Ahle and Peter Michael Reichstein Rasmussen Tiling with Squares and Packing Dominos in Polynomial Time	
12:00–13:30	Lunch (Restaurant, Harnack-Haus)		
13:30–14:30	Award Ceremony (Goethe-Saal, Harnack-Haus) Chair: Dan Halperin		
14:30–15:30	6th Workshop on Geometry and Machine Learning–Session 1 (Goethe-Saal, Harnack-Haus)	2nd International Workshop on Uncertainty in Computational Geometry–Session 1 (Hahn-Hörsaal, Harnack-Haus)	Workshop in Combinatorial Geometry–Session 1 (Meitner-Saal 1, Harnack-Haus)
	<ul style="list-style-type: none"> 14:30–14:50: Leyla Biabani Coresets for the k-Center Problem with Outliers 14:50–15:10: Jordan Ganev The QR Decomposition for Radial Neural Networks 15:10–15:30:  Jules Wulms The Influence of Dimensions on the Complexity of Computing Decision Trees 	<ul style="list-style-type: none"> 14:30–14:40: Maarten Löffler / Benjamin Raichel Introduction and Overview 14:45–15:25: David Kirkpatrick Query Strategies for Maintaining Low Potential Congestion/Interference Among Moving Entities 	
15:30–16:00	Coffee Break (Lobby, Harnack-Haus)		

Time			
16:00–18:00	6th Workshop on Geometry and Machine Learning–Session 2 (Goethe-Saal, Harnack-Haus)	2nd International Workshop on Uncertainty in Computational Geometry–Session 2 (Hahn-Hörsaal, Harnack-Haus)	Workshop in Combinatorial Geometry–Session 2 (Meitner-Saal 1, Harnack-Haus)
	<ul style="list-style-type: none"> 16:00–17:00: Michael Schaub Signal Processing on Graphs and Complexes 17:00–17:20: Louis Theran Maximum Likelihood Thresholds via Graph Rigidity 17:20–17:40: 🇨🇳 Chao Chen Persistent Homology for Trojan Detection 17:40–18:00: 🇨🇳 Elizabeth Coda Fiber Bundle Morphisms as a Framework for Modeling Many-to-Many Maps 	<ul style="list-style-type: none"> 16:00–16:40: Mohammad Farshi Imprecise Spanners 16:45–17:25: Kevin Buchin Uncertain Trajectories 17:30–18:00: Maarten Löffler / Benjamin Raichel Discussion 	

Saturday, 11. June 2022

Time	
14:00–18:00	Rote-Alt-Fest: Talks and Anecdotes (Großer Hörsaal, Institut für Informatik)
18:00–???	Rote-Alt-Fest: Barbecue (Lobby, Institut für Informatik)

