

28th International Conference on Database Theory

ICDT 2025, March 25–28, 2025, Barcelona, Spain

Edited by

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LIPICS

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■ Contents

Preface	
<i>Sudeepa Roy and Ahmet Kara</i>	0:ix
ICDT 2025 Test of Time Award	
<i>Xiao Hu, Graham Cormode, and Marcelo Arenas</i>	0:xi
Organization	
.....	0:xiii
External Reviewers	
.....	0:xv
List of Authors	
.....	0:xvii

Invited Talks

The Quest for Faster Join Algorithms	
<i>Paraschos Koutris, Shaleen Deep, Austen Fan, and Hangdong Zhao</i>	1:1–1:12
Data Management Perspectives on Prescriptive Analytics	
<i>Alexandra Meliou, Azza Abouzied, Peter J. Haas, Riddho R. Haque, Anh Mai, and Vasileios Vittis</i>	2:1–2:12
Evaluating First-Order Formulas in Structured Graphs	
<i>Szymon Toruńczyk</i>	3:1–3:2

Regular Papers

Learning Aggregate Queries Defined by First-Order Logic with Counting	
<i>Steffen van Berghem and Nicole Schweikardt</i>	4:1–4:19
Bag Containment of Join-On-Free Queries	
<i>George Konstantinidis and Fabio Mogavero</i>	5:1–5:18
PAC: Computing Join Queries with Semi-Covers	
<i>Heba Aamer and Bas Ketsman</i>	6:1–6:20
$O(1)$ -Round MPC Algorithms for Multi-Dimensional Grid Graph Connectivity, Euclidean MST and DBSCAN	
<i>Junhao Gan, Anthony Wirth, and Zhuo Zhang</i>	7:1–7:20
Enumeration of Minimal Hitting Sets Parameterized by Treewidth	
<i>Batya Kenig and Dan Shlomo Mizrahi</i>	8:1–8:20
Query Languages for Neural Networks	
<i>Martin Grohe, Christoph Standke, Juno Steegmans, and Jan Van den Bussche</i> ...	9:1–9:18
Maximizing the Optimality Streak of Deferred Data Structuring (a.k.a. Database Cracking)	
<i>Yufei Tao</i>	10:1–10:18

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Semantic Foundations of Equality Saturation <i>Dan Suciu, Yisu Remy Wang, and Yihong Zhang</i>	11:1–11:18
Tractable Conjunctive Queries over Static and Dynamic Relations <i>Ahmet Kara, Zheng Luo, Milos Nikolic, Dan Olteanu, and Haozhe Zhang</i>	12:1–12:21
Symmetric Linear Arc Monadic Datalog and Gadget Reductions <i>Manuel Bodirsky and Florian Starke</i>	13:1–13:20
Repairing Databases over Metric Spaces with Coincidence Constraints <i>Youri Kaminsky, Benny Kimelfeld, Ester Livshits, Felix Naumann, and David Wajc</i>	14:1–14:18
Query Repairs <i>Balder ten Cate, Phokion G. Kolaitis, and Carsten Lutz</i>	15:1–15:19
Quantum Data Sketches <i>Qin Zhang and Mohsen Heidari</i>	16:1–16:19
Partition Constraints for Conjunctive Queries: Bounds and Worst-Case Optimal Joins <i>Kyle Deeds and Timo Camillo Merkl</i>	17:1–17:18
A Framework for Extraction and Transformation of Documents <i>Cristian Riveros, Markus L. Schmid, and Nicole Schweikardt</i>	18:1–18:19
Beyond Logarithmic Bounds: Querying in Constant Expected Time with Learned Indexes <i>Luis Alberto Croquevielle, Guang Yang, Liang Liang, Ali Hadian, and Thomas Heinis</i>	19:1–19:21
A Formal Language Perspective on Factorized Representations <i>Benny Kimelfeld, Wim Martens, and Matthias Niewerth</i>	20:1–20:20
Targeted Least Cardinality Candidate Key for Relational Databases <i>Vasileios Nakos, Hung Q. Ngo, and Charalampos E. Tsourakakis</i>	21:1–21:18
Queries with External Predicates <i>Paolo Guagliardo, Leonid Libkin, Victor Marsault, Wim Martens, Filip Murlak, Liat Peterfreund, and Cristina Sirangelo</i>	22:1–22:20
A Simple Algorithm for Worst Case Optimal Join and Sampling <i>Florent Capelli, Oliver Irwin, and Sylvain Salvati</i>	23:1–23:19
Learning Tree Pattern Transformations <i>Daniel Neider, Leif Sabellek, Johannes Schmidt, Fabian Vehlken, and Thomas Zeume</i>	24:1–24:20
Optimal Oblivious Algorithms for Multi-Way Joins <i>Xiao Hu and Zhiang Wu</i>	25:1–25:19
Dynamic Direct Access of MSO Query Evaluation over Strings <i>Pierre Bourhis, Florent Capelli, Stefan Mengel, and Cristian Riveros</i>	26:1–26:18
Parallel Query Processing with Heterogeneous Machines <i>Simon Frisk and Paraschos Koutris</i>	27:1–27:18

Generalized Covers for Conjunctive Queries <i>Paraschos Koutris</i>	28:1–28:15
FC-Datalog as a Framework for Efficient String Querying <i>Owen M. Bell, Joel D. Day, and Dominik D. Freydenberger</i>	29:1–29:18
An FPRAS for Model Counting for Non-Deterministic Read-Once Branching Programs <i>Kuldeep S. Meel and Alexis de Colnet</i>	30:1–30:21
On Deciding the Data Complexity of Answering Linear Monadic Datalog Queries with LTL Operators <i>Alessandro Artale, Anton Gnatenko, Vladislav Ryzhikov, and Michael Zakharyashev</i>	31:1–31:19
The Free Termination Property of Queries over Time <i>Conor Power, Paraschos Koutris, and Joseph M. Hellerstein</i>	32:1–32:22

Database Theory in Action Papers

Database Theory in Action: Making Provenance and Probabilistic Database Theory Work in Practice (Invited Talk) <i>Silviu Maniu and Pierre Senellart</i>	33:1–33:6
Database Theory in Action: Search-Based Program Optimization <i>Yihong Zhang, Dan Suciu, Yisu Remy Wang, and Max Willsey</i>	34:1–34:6
Database Theory in Action: Database Visualization <i>Eugene Wu</i>	35:1–35:6
Database Theory in Action: Cypher, GQL, and Regular Path Queries <i>Amélie Gheerbrant, Leonid Libkin, Liat Peterfreund, and Alexandra Rogova</i>	36:1–36:5

Preface

The 28th International Conference on Database Theory (ICDT 2025) was held in Barcelona, Spain, from March 25th to March 28th, 2025. The Program Committee has selected 29 research papers out of 80 submissions for publication at the conference. The Program Committee has further decided to give both the ICDT 2025 Best Paper Award and the Best Student Paper Award to:

Worst-Case Optimal Joins Meet Partition Constraints
Kyle Deeds and Timo Camillo Merkl

We congratulate the winners!

ICDT 2025 had a new track called “Database Theory in Action” to showcase the applications of database theory in practice. The Program Committee has selected 3 papers out of 6 submissions and has invited one paper in this track.

Apart from the 29 regular papers and 4 database theory in action papers, these proceedings include papers accompanying the invited (shared) EDBT/ICDT keynotes by Paraschos Koutris (University of Wisconsin, Madison) and Alexandra Meliou (University of Massachusetts, Amherst). It also includes an abstract for the ICDT invited lecture by Szymon Toruńczyk (University of Warsaw).

A committee formed by Marcelo Arenas, Graham Cormode, and Xiao Hu has decided to give the Test-of-Time Award for ICDT 2025 to the following ICDT 2015 paper:

Regular Queries on Graph Databases
Juan L. Reutter, Miguel Romero, and Moshe Y. Vardi

We would like to thank all people who contributed to the success of ICDT 2025, including the authors of all submitted papers, keynote and invited talk speakers, and, of course, all members of the Program Committee as well as the external reviewers, for the very substantial work that they have invested over the two submission cycles of ICDT 2025. Their effort and wisdom were critical to ensure that the final program of the conference satisfies the highest standards. We would also like to thank the ICDT Council members for their support on a wide variety of matters; the Program Committee Chairs of EDBT, Alkis Simitsis and Bettina Kemme, for their assistance; and the local organizers of the EDBT/ICDT 2025 conference, led by General Chairs Oscar Romero Moral and Anna Queralt Calafat, for the great job they did in organizing the conference and co-located events.

Finally, we wish to acknowledge Dagstuhl Publishing for their support with the publication of the proceedings in the LIPIcs (Leibniz International Proceedings in Informatics) series.

Sudeepa Roy and Ahmet Kara
March 2025

■ ICDT 2025 Test of Time Award

In 2013, the International Conference on Database Theory (ICDT) began awarding the ICDT Test-of-Time (ToT) award, with the goal of recognizing one paper, or a small number of papers, presented at earlier ICDT conferences that have best met the “test of time”. In 2025, the award recognizes a paper selected from the proceedings of the ICDT 2015 conference that has had the highest impact in terms of research, methodology, conceptual contribution, or transfer to practice over the past decade. The award was presented during the EDBT/ICDT 2025 Joint Conference, March 25–28, 2025 in Barcelona, Spain.

The 2025 ToT Award Committee consists of Xiao Hu, Graham Cormode, and Marcelo Arenas (chair). After careful consideration and soliciting external assessments, the committee has chosen the following contribution for the 2025 ICDT Test-of-Time Award:

Regular Queries on Graph Databases

Juan L. Reutter, Miguel Romero, Moshe Y. Vardi

Graph databases have become a key data model, distinguished by their emphasis on navigational queries to discover connections between nodes based on specified navigational expressions. In this seminal work, the authors introduced the query language Regular Queries (RQ), a formalism that extends other well-known and studied graph query languages, such as UC2RPQs and UCN2RPQs, by incorporating transitive closure rules into non-recursive Datalog. Although this language had been considered prior to this paper, its algorithmic properties were not well understood. A major contribution of this paper is proving that the containment problem for Regular Queries is 2EXPSPACE-complete, a fundamental result for understanding its algorithmic properties. This study positioned RQ as an expressive yet computationally manageable fragment, bridging theoretical advancements with practical applications and influencing database theory and practice, while inspiring subsequent research on graph query languages, including the new standard languages GQL and SQL/PGQ for graph databases. Follow-up works have further explored the expressive power and utility of Regular Queries in areas such as streaming graph query processing, graph view maintenance with Regular Datalog, and the development of graph query language taxonomies, showing the broad influence of this framework across both theoretical and practical domains.

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