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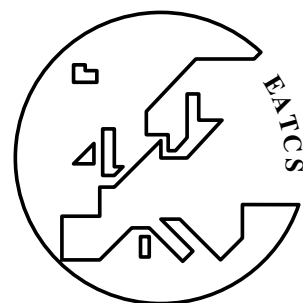
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■ Preface

This volume contains the papers presented at the *52nd EATCS International Conference on Automata, Languages and Programming (ICALP 2025)*, held in Aarhus, Denmark, during July 8–11, 2025. ICALP is a series of annual conferences of the *European Association for Theoretical Computer Science (EATCS)*, which first took place in 1972.

The ICALP 2025 program consisted of two tracks:

Track A: Algorithms, Complexity, and Games

Track B: Automata, Logic, Semantics, and Theory of Programming

In response to the call for papers, a total of 563 eligible, anonymous submissions were received: 445 for Track A and 118 for Track B. The committees decided to accept 170 papers for inclusion in the scientific program: 135 papers for Track A and 35 for Track B. The selection was made by the program committees based on originality, quality, and relevance to theoretical computer science. The quality of the submissions was very high, and many deserving papers could not be selected.

The EATCS sponsored awards for both a best paper and a best student paper in each of the two tracks, selected by the program committees. The **best paper awards** were given to the following papers:

Track A: Ahmed Shalaby and Damien Woods. *An efficient algorithm to compute the minimum free energy of interacting nucleic acid strands.*

Track B: Thomas Colcombet, Amina Doumane, and Denis Kuperberg. *Tree algebras and bisimulation-invariant MSO on finite graphs.*

The **best student paper awards**, for papers that are solely authored by students, were given to the following papers:

Track A: Ben Young. *The Converse of the Real Orthogonal Holant Theorem.*

Track B: Tikhon Pshenitsyn. *First-Order Intuitionistic Linear Logic and Hypergraph Languages.*

ICALP 2025 included invited presentations by

- Anupam Gupta, New York University, USA,
- Dana Ron-Goldreich, Tel Aviv University, Israel,
- Mary Wootters, Stanford University, USA,
- Hongseok Yang, KAIST, Korea.

This volume contains all the contributed papers presented at the conference, and an abstract or paper accompanying some of the invited talks.

The program of ICALP 2025 also included presentations of

- the EATCS Award 2025 to Rajeev Alur (University of Pennsylvania),
- the Presburger Award 2025, awarded jointly to Tomasz Kociumaka (MPI for Informatics) and Sepehr Assadi (University of Waterloo),
- the Alonzo Church Award 2025 to Paul Blain Levy (University of Birmingham).

The EATCS Distinguished Dissertation Award 2024 was awarded jointly to the following PhD dissertations:

- Joakim Blikstad (KTH Royal Institute of Technology). *Matchings, Maxflows, Matroids: The Power of Augmenting Paths and Computational Models.*
- Christoph Grunau (ETH Zurich). *Sampling with Certainty in Distributed and Parallel Computations.*

52nd International Colloquium on Automata, Languages, and Programming (ICALP 2025).

Editors: Keren Censor-Hillel, Fabrizio Grandoni, Joël Ouaknine, and Gabriele Puppis



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■ Tuukka Korhonen (University of Bergen). *Computing Width Parameters of Graphs*.

There was also the announcement of the new EATCS Fellows for 2025, who are:

■ Kasper Green Larsen (Aarhus University),

■ Anca Muscholl (University of Bordeaux).

The following workshops were held as satellite events of ICALP 2025, during July 7, 2025:

■ Algorithmic Aspects of Temporal Graphs

■ Fair Resource Allocation: Concepts, Algorithms and Complexity

■ Loop Invariants and Algebraic Reasoning

■ Graph Width Parameters

■ Theory and Applications of Algorithms with Predictions

We wish to thank all authors who submitted extended abstracts for consideration, the program committees for their scholarly effort, and all the reviewers who assisted the program committees in the evaluation process.

We are grateful to the Conference General Chairs, Ioannis Caragiannis and Kasper Green Larsen, the Workshop Chair, Chris Schwiegelshohn, their colleagues at Aarhus University – especially to Maja Malmndorf Andersen and Vibe Falkenhard from the administrative team – and to the EATCS, for their invaluable support in organizing ICALP 2025 in Aarhus.

Finally, we would like to thank Thore Husfeldt, the Chair of the ICALP Steering Committee, and Giuseppe F. Italiano, the president of EATCS, for their support, as well as the editorial office of LIPIcs for their support in editing these proceedings.

July 2025

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