

Approximation, Randomization, and Combinatorial Optimization. Algorithms and Techniques

**APPROX/RANDOM 2025, August 11–13, 2025,
Berkeley, CA, USA**

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Preface

This volume contains the papers presented at the 28th International Conference on Approximation Algorithms for Combinatorial Optimization Problems (APPROX 2025) and the 29th International Conference on Randomization and Computation (RANDOM 2025). APPROX focuses on algorithmic and complexity issues surrounding the development of efficient approximate solutions to computationally-difficult problems, and the 2025 edition was the 28th in the series. RANDOM is concerned with applications of randomness to computational and combinatorial problems, and the 2025 edition was the 29th in the series. The two conferences were held in parallel at University of California, Berkeley, USA during August 11–13, 2025. This year, the plenary speaker for APPROX was Sergei Vassilvitskii from Google, New York, and the plenary speaker for RANDOM was Venkatesan Guruswami from UC Berkeley.

Topics of interest for APPROX include approximation algorithms, hardness of approximation, small space, sub-linear time and streaming algorithms, online algorithms, approaches that go beyond worst case analysis, distributed and parallel approximation, embeddings and metric-space methods, mathematical-programming methods, spectral methods, combinatorial optimization, algorithmic game theory, mechanism design and economics, computational-geometry problems, approximate learning. Those at RANDOM include the design and analysis of randomized algorithms, randomized complexity theory, pseudorandomness and derandomization, random combinatorial structures, random walks/Markov chains, expander graphs and randomness extractors, probabilistic proof systems, random projections and embeddings, error-correcting codes, average-case analysis, smoothed analysis, property testing, sublinear-time and local algorithms, computational learning theory, and the role of (pseudo)randomness in other areas of computer science such as cryptography, data privacy, and quantum information.

Prior to 2003, APPROX took place in Aalborg (1998), Berkeley (1999), Saarbrücken (2000), Berkeley (2001), and Rome (2002), while RANDOM took place in Bologna (1997), Barcelona (1998), Berkeley (1999), Geneva (2000), Berkeley (2001), and Harvard (2002). Since 2003, APPROX and RANDOM have been co-located, taking place in Princeton (2003), Cambridge (2004), Berkeley (2005), Barcelona (2006), Princeton (2007), Boston (2008), Berkeley (2009), Barcelona (2010), Princeton (2011), Boston (2012), Berkeley (2013), Barcelona (2014), Princeton (2015), Paris (2016), Berkeley (2017), Princeton (2018), Boston (2019), Atlanta (2023) and London (2024). In 2020, 2021, and 2022, the conferences were held online.

The volume contains 27 contributed papers selected by the APPROX Program Committee out of 46 submissions, and 41 contributed papers selected by the RANDOM Program Committee out of 88 submissions. We would like to thank all the authors who submitted papers, the members of the program committees, and the external reviewers. We are grateful for the guidance of the steering committees: Jarosław Byrka, Samir Khuller, Amit Kumar, Monaldo Mastrolili, Nicole Megow, Laura Sanità, Chaitanya Swamy, László Végh, Virginia Vassilevska Williams, and David P. Williamson for APPROX, and Oded Goldreich, Raghu Meka, Cris Moore, Anup Rao, Omer Reingold, Dana Ron, Noga Ron-Zewi, Ronitt Rubinfeld, Amit Sahai, Ronen Shaltiel, Alistair Sinclair, and Paul Spirakis for RANDOM.

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We would also like to thank the local organizing committee at UC Berkeley Sami Davies, Prasad Raghavendra, and Avishay Tal, and the Dagstuhl Publishing Team for their dedicated handling of the proceedings.

It was our pleasure to serve as chairs of the Approx/Random 2025 Program Committees, and to edit this volume of the proceedings.

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