

# Foreword

We welcome you to the 16th ACM International Conference on Distributed and Event-Based Systems — DEBS 2022 — hosted as a hybrid conference at the University of Copenhagen, Denmark.

DEBS 2022 is the sixteenth in a series that spans 20 years of history, with 15 past editions as a conference and five editions as a workshop co-located with major conferences. The objectives of the ACM International Conference on Distributed and Event-Based Systems (DEBS) have been to provide a forum dedicated to the dissemination of original research, the discussion of practical insights, and the reporting of experiences relevant to distributed systems and event-based computing. The conference provides a forum for academia and industry to exchange ideas through its tutorials, research papers, and the grand challenge. Recently, the ACM International Conference on Distributed and Event-Based Systems, including DEBS 2022, has become the premier venue for cutting-edge research in the integration of distributed and event-based systems in relevant domains such as Big Data, AI, ML, IoT, and Blockchain.

As in previous years, DEBS 2022 included the Research track, Industry and Application track, Demos and Posters track, Grand Challenge track, and Doctoral Symposium. This year, there was an increased focus on widening the scope of and participation in the conference, which has been successful in attracting papers from the communities working on data management, machine learning, and blockchain technologies. The call for research papers included both regular (12 pages) papers as well as short (6 pages) papers, vision papers, and 2 special focus areas: *climate change and sustainability*, and *the COVID-19 pandemic*. Additionally, it introduced the *Best Newcomer* paper award, given to the best paper with first-time authors in any DEBS track. This year again, the authors of selected top-rated papers will be invited to submit extended versions for a special issue in Elsevier Information Systems. To place more emphasis on reproducibility, DEBS 2022 introduced the possibility of receiving the *ACM Artifacts Available* badge on submissions following the relevant guidelines.

In another first, DEBS 2022 joined the *Diversity and Inclusion* (D&I) initiative of the database community aiming to build inclusive and equitable conferences. Towards this, DEBS 2022 included a D&I talk titled “It’s funny because it’s true — confronting scientific catechisms through comic books”, provided guidelines and examples of inclusive and discriminatory behaviour and language, and encouraged authors and participants to consider them when composing their papers and presentations. Furthermore, it introduced a *D&I compliance* designation, marking those camera-ready papers in the Research and Industrial & Application tracks that followed the D&I guidelines. Finally, it circulated pre- and post-conference surveys, collecting anonymous data that will be used to improve our understanding of our community so that more effective strategies to promote D&I can be developed. With these actions, DEBS 2022 hopes to help in building welcoming scientific environments, attracting and retaining talented scientists whose work and contributions might otherwise be lost.

Our second main objective was to adapt to the conditions imposed by the ongoing COVID-19 pandemic. Organizing a hybrid conference that is inclusive for both in-person and remote participants was a major challenge — it was the equivalent to organizing two conferences. The session took place live at the University of Copenhagen, while remote participants were able to join online through the VGATE (*Virtual Gate*) — <https://vgate.cs.ucy.ac.cy/>. The conference was condensed and adapted for the online format, and we were able to provide videos on-demand for the presentations, building on the experience of last year’s fully-online edition.

The call for research contributions attracted 19 submissions: 14 regular research papers, two short research papers, two vision papers, and one focus area paper (COVID-19 pandemic). Four papers were initially accepted, while a revision was requested for eight additional papers. Eventually, six of the latter were also accepted, for a total of 10 accepted submissions organized in three sessions. Every paper had five

independent reviews. In addition to the research sessions, the program includes an Industrial and Applications session with three papers, a Demonstration and Poster Session session with four presentations combined with the Doctoral Symposium's paper, three tutorial sessions with short tutorials, two tutorial sessions with the parts of a long tutorial, and a Grand Challenge session with seven competition papers.

The DEBS Grand Challenge is a series of competitions that started in 2010, in which both participants from academia and industry compete with the goal of building faster and more scalable distributed and event-based systems that solve a practical problem. Every year, the DEBS Grand Challenge participants have a chance to explore a new data set and a new problem and can compare their results based on the common evaluation criteria. The 2022 DEBS Grand Challenge focuses on real-time complex event processing of real-world high-volume tick data provided by Infront Financial Technology. In the data set, about 5000+ financial instruments are being traded on three major exchanges over the course of a week. The goal of the challenge is to efficiently compute specific trend indicators and detect patterns resembling those used by real-life traders to decide on buying or selling on the financial markets.

The DEBS 2022 Best Paper award was given to "Predicate-Based Push-Pull Communication for Distributed Complex Event Processing" by Steven Purtzel, Samira Akili, and Matthias Weidlich; the Best Student Paper award to "Toward Reducing Cross-shard Transaction Overhead in Sharded Blockchains" by Liuyang Ren, Paul Ward, and Bernard Wong; and the Best Newcomer award to "A Multi-level Caching Architecture to Improve Stateful Stream Processing of Modern Machine Learning Workflows" by Muhammed Tawfiqul Islam, Renata Borovica-Gajic, and Shanika Karunasekera. The winner of the Test-of-Time award was the paper titled "Partition and Compose: Parallel Complex Event Processing" by Martin Hirzel.

DEBS 2022 also featured four keynote speeches, three invited industry talks, one panel and a D&I brief. We would like to thank our keynote speakers, Ioana Manolescu, Pat Helland, Frank McSherry, and Till Rohrmann, our D&I speakers, Falaah Arif Khan and Sihem Amer-Yahia, our Panel organizers, Antoine Amarilli, Christophe Claramunt, and Demetris Zeinalipour, our tutorial speakers, Alessandro Margara, Alexander Artikis, Jim Dowling, and Jorge Arnulfo Quiane Ruiz, our invited industry speakers Yingjun Wu, Anna Almén and Madalina Ciortan, for sharing their knowledge and experiences with the DEBS community. We also wish to thank all the speakers who enriched the program through the research and industry track presentations, the doctoral symposium, the Grand Challenge solutions, and the demos and posters presentations.

We thank our peers who graciously volunteered to help with the organization of the DEBS conference: Valeria Cardellini and Yingjun Wu (Industry and Application Co-Chairs); Sebastian Frischbier, Arne Hormann, Ruben Mayer, Jawad Tahir, and Christoph Doblender (Grand Challenge Co-Chairs); Paris Carbone and Danh Le Phuoc (Tutorials/Workshop Co-Chairs); David Eyers and Genoveva Vargas-Solar (Doctoral Symposium Co-Chairs); Daniele Dell'Aglio and Asterios Katsifodimos (Poster and Demo Co-Chairs); Vana Kalogeraki (Diversity and Inclusion Co-Chair); Zsolt István and Dimitrios Georgakopoulos (Publicity Co-Chairs); Rodrigo Laigner and Yijian Liu (Web Co-Chairs); and, of course, all the members of the DEBS Steering Committee.

We thank ACM for supporting the conference despite the challenges of the COVID-19 pandemic. We thank our main sponsors, ACM SIGMOD and ACM SIGSOFT. We thank our silver sponsors EURA NOVA and Singularity Data, and our bronze sponsor Infront. We thank the University of Copenhagen for supporting the conference's logistics. We thank the committee members of the various tracks as well as the additional reviewers for their contribution in assembling such a high-quality program. Finally, a special thank goes to all the authors that submitted to the various tracks, without their contribution, DEBS 2022 would not be possible.

We hope that you will find our program exciting, inspiring, and thought-provoking. The conference will provide you with valuable opportunities to engage with the ideas of academic researchers and practitioners

from around the world, both from academia and industry, originally presented in person after two years of virtual DEBS conferences. Thank you for participating in DEBS 2022!

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