

## Guest Editors' Notes

Welcome to the March 2023 issue of the ACM SIGMOD Record!

The new year of 2023 begins with a special issue on the **2022 ACM SIGMOD Research Highlight Award**. This is an award for the database community to showcase a set of research projects that exemplify core database research. In particular, these projects address an important problem, represent a definitive milestone in solving the problem, and have the potential of significant impact. This award also aims to make the selected works widely known in the database community, to our industry partners, and to the broader ACM community.

The award committee and editorial board included Marcelo Arenas, Rada Chirkova, Alfons Kemper, Samuel Madden, Wim Martens, and Kenneth Ross. We solicited articles from PODS 2022, SIGMOD 2022, VLDB 2022, ICDE 2022, EDBT 2022, and ICDT 2022, as well as from community nominations. We use a careful review process, in which each nominated paper is discussed in a virtual meeting. Papers with conflict of interest are discussed in the absence of the conflicting committee members. This year, twelve articles were finally selected as 2022 Research Highlights.

The authors of each article worked closely with an associate editor to rewrite the article into a compact 8-page format and improved it to appeal to the broad data management community. In addition, each research highlight is accompanied by a one-page technical perspective written by an expert on the topic presented in the article. The technical perspective provides the reader with an overview of the background, the motivation, and the key innovation of the featured research highlight, as well as its scientific and practical significance.

The 2022 research highlights cover a broad set of topics, including

- 1) a study of how real world applications use (and sometimes misuse) DBMS transactional capabilities (“Ad Hoc Transactions in Web Applications: The Good, the Bad, and the Ugly”);
- 2) a new graph data structure designed to serve analytics, traversals, and pattern matching workloads on dynamic graphs (“Sortledton: a Universal Graph Data Structure”);
- 3) a holistic approach for handling transactions in multi-engine database systems (“Efficiently Making Cross-Engine Transactions Consistent”);
- 4) a new approach for ensuring that transaction workloads are serializable even when running them under the weaker isolation level called *read committed* (“When is it Safe to Run a Transactional Workload under Read Committed?”);
- 5) an investigation of how indexing can be done on disaggregated memory for write-heavy workloads (“Building Write-Optimized Tree Indexes on Disaggregated Memory”);
- 6) a new and asymptotically optimal algorithm for a large class of conjunctive queries with comparisons (“Conjunctive Queries with Comparisons”);

- 7) a study of threshold queries showing how common these queries are in practice and how they can be evaluated efficiently (“Threshold Queries”);
- 8) a theoretical foundation of convergence in an extension of Datalog that incorporates quantitative aspects (“Convergence of Datalog over Pre-Semirings”);
- 9) an algorithm for finding an element in a partially ordered dataset that is optimal in terms of the number of reachability queries used (“An Optimal Algorithm for Partial Order Multiway Search”);
- 10) a study that brings two classes of summary-based cardinality estimators for optimizing join plans together in a common framework (“Accurate Summary-based Cardinality Estimation Through the Lens of Cardinality Estimation Graphs”);
- 11) an implementation and evaluation of runtime query processing and optimization (“Revisiting Runtime Dynamic Optimization for Join Queries in Big Data Management Systems”); and
- 12) the first differentially private mechanism for answering SPJA queries in a database with foreign key constraints (“R2T: Instance-optimal Truncation for Differentially Private Query Evaluation with Foreign Keys”).

The issue closes with an ACM SIGMOD announcement on some of the happenings at ACM SIGMOD over the past couple of years.

On behalf of the SIGMOD Record Editorial Board, we hope that you enjoy reading the March 2023 issue of the SIGMOD Record!

Marcelo Arenas  
Samuel Madden

Rada Chirkova  
Wim Martens

Alfons Kemper  
Kenneth Ross

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