



Special issue on the best papers of DaMoN 2020

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The annual workshop on Data Management on New Hardware (DaMoN) has established itself as a key publication venue in the database community. The topics covered by the workshop range from benchmarking database systems on new hardware to hardware-conscious database techniques to new hardware designs optimized for database systems.

The sixteenth DaMoN workshop was held virtually on June 15, 2020, in conjunction with the SIGMOD Conference. In recent years, DaMoN has become one of the best-attended pre-conference workshops at SIGMOD, and the first virtual edition was no exception. The workshop was co-chaired by Thomas Neumann and Danica Porobic, and the program contained eighteen research papers.

This special “Best of DaMoN” section contains extended versions of three papers from the workshop. The papers were selected by the workshop co-chairs and invited to submit to this special section. All the papers have at least 30% new material compared to the workshop version and underwent the VLDB Journal’s normal reviewing process, with some of the original DaMoN reviewers and new reviewers who were not part of the DaMoN program committee.

The first paper, titled “Low-Latency Query Compilation”, discusses different tradeoffs in query compilation techniques and identifies significant opportunities for improvement. Authors seize them and propose a novel lightweight domain-specific intermediate representation for compilation of data management workloads, as well as techniques used to translate this representation to machine code. Effectiveness of this approach is showcased using a prototype SQL engine that achieves significant speedups over the state-of-the-art LLVM-based query compiler.

The second paper, titled “The Full Story of 1000 Cores: An Examination of Concurrency Control on Real(ly) Large Multi-Socket Hardware”, presents a comprehensive benchmarking study of concurrency control protocols on 3 very large-scale systems. It extends the workshop paper with two

additional hardware systems, as well as additional workload types. Overall, the authors identify several differences in behavior compared to the previous work that has relied on simulation of a 1000 core system, analyze differences in hardware protocols that have direct impact on the observed concurrency control protocols, address the sources of contention to improve performance and summarize a large number of guidelines and opportunities for future work on transaction processing systems for large-scale hardware.

The third paper, titled “To Share or not to Share Vector Registers?”, proposes a novel way of utilizing vector registers to optimize performance of multiple concurrent queries by using them as a unit of work-sharing. Authors explore rich design space of work-sharing using vector registers and systematically evaluate various configurations on 3 different processors with 4 vector lengths. The extensive discussion of observed results and clear takeaways provide an excellent starting point for the integration of proposed approach in end-to-end data analytics system.

I would like to thank my DaMoN co-chair Thomas, program committee and the VLDB Journal reviewers for their efforts in reviewing these papers that have made this special section possible.

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Guest Editor of the Special Section.

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