SFU Data Science Research Group presents
Seminar Series on Trustworthy Data Science and AI

SFU | SIMON FRASER UNIVERSITY

Anastasia Ailamaki

Professor, the École Polytechnique Fédérale de Lausanne (EPFL)

Nothing is for granted: Making wise decisions using real-time intelligence

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Abstract

In today's ever-growing demand for fast, data-driven decisions, heterogeneity severely undermines performance and fragments efforts for building unified data exploration tools. The variety in data formats and workloads forces data pipelines to be manually split across a variety of task-specialized systems and combined through expensive ETL and orchestration processes, or to adapt both the data and the workloads to match the requirements of a single-system, sacrificing expressiveness and structural information. Furthermore, the ever-increasing hardware heterogeneity causes task-based specialization of the tools to specific hardware such as CPUs or GPUs, forcing a trade-off: designing optimized hardware often means wasting accelerator-level parallelism (ALP) opportunities or tolerating slow and unnecessary communication between devices. In general, data processing is adapted to the pre-determined data processing system architecture, losing valuable information in the translation.

Real-time intelligence means to make all decisions during execution, when all relevant information is available for optimal utilisation of resources, while it also learns and extracts information about the query requests, instead of depending on pre-determined workload expectations. I will show how designing top-down the system architecture to allow a data- and workload-driven just-in-time specialization enables fast query execution over unprepared, potentially dirty data without time consuming preparation, as well as efficient orchestration and utilization of heterogeneous hardware devices.

Biography

Anastasia Ailamaki is a Professor of Computer and Communication Sciences at the École Polytechnique Fédérale de Lausanne (EPFL) in Switzerland and the co-founder of RAW Labs SA, a Swiss company developing real-time analytics infrastructures for heterogeneous big data from multiple sources. She earned a Ph.D. in Computer Science from the University of Wisconsin-Madison in 2000. She received the 2019 ACM SIGMOD Edgar F. Codd Innovations and the 2020 VLDB Women in Database Research Award. She is also the recipient of an ERC Consolidator Award (2013), the Finmeccanica endowed chair from the Computer Science Department at Carnegie Mellon (2007), a European Young Investigator Award from the European Science Foundation (2007), an Alfred P. Sloan Research Fellowship (2005), an NSF CAREER award (2002), and ten best-paper awards in database, storage, and computer architecture conferences. She is an ACM fellow, an IEEE fellow, the Laureate for the 2018 Nemitsas Prize in Computer Science, and an elected member of the Swiss, the Belgian, the Greek, and the Cypriot National Research Councils. She is a member of the Academia Europaea and of the World Economic Forum Expert Network.

All are welcome.
Enquires: Jian Pei (jpei@sfu.ca)

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