ΔΙΑΛΕΞΗ

"Efficient Indexes for Data Queries Combining Geometry with Query Processing"

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Περίληψη – Abstract

Query processing is an important problem in many research fields, including database systems, data mining, and geometric computing. The goal is to preprocess input data into an index to efficiently answer queries. With the data sets becoming increasingly large and complex, queries are also becoming complex, therefore new challenging problems have emerged in query processing. In this presentation, I show how to use techniques and notions from computational geometry to design efficient indexes for practical and complex data queries over big data.

The first part of the talk is on designing efficient indexes for Approximate Query Processing (AQP). I present PASS, an efficient dynamic index for answering range aggregation queries by combining hierarchical spatial partitioning and stratified sampling. PASS provides theoretical guarantees on the confidence intervals, it uses low space and answers queries with low latency. Interestingly, it outperforms the state-of-the-art AQP systems on aggregation queries. In the second part of the talk, I briefly describe how various complex queries, such as top-k queries and join queries, can benefit from the design of geometric indexes. In this presentation, I mostly focus on top-k queries under certain practical constraints, like diverse top-k, durable top-k, and uncertain top-k, with various applications in online stores, recommendation systems, and computational journalism. I will conclude the talk with some future research directions.

Stavros Sintos is an Assistant Professor in the Department of Computer Science at the University of Illinois Chicago. Before joining UIC, he was a Postdoctoral Scholar on Data Management at the University of Chicago working with Asst. Prof. Sanjay Krishnan and Prof. Michael Franklin. He obtained his Ph.D. in Computer Science at Duke University under the supervision of Prof. Pankaj K. Agarwal. He also obtained his B.S. in the Department of Computer Science at the University of Ioannina in Greece. He is a recipient of the James B. Duke Fellowship, and he was nominated for the 2019-2020 outstanding Ph.D. dissertation award for his thesis titled "Efficient Algorithms for Querying Large and Uncertain Data". His main research interest is in the design of efficient algorithms for problems in databases, data mining, and data management. In particular, he works on designing practical geometric indexes with theoretical guarantees focusing on approximate query processing, top-k queries, summarization queries, and join queries. His work has been published in top-tier conferences and journals such as VLDB, SIGMOD, ICDE, PODS, ICALP, JCSS. For more details, please visit stavrossintos.info.

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