

Adaptively Approximate Techniques in Distributed Architectures

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The wealth of information generated by users interacting with the network and its applications is often under-utilized due to complications in accessing heterogeneous and dynamic data and in retrieving relevant information from sources having possibly unknown formats and structures. Processing complex requests on such information sources is, thus, costly, though not guaranteeing user satisfaction.

In such environments, requests are often relaxed and query processing is forced to be adaptive and approximate, either to cope with limited processing resources (QoS-oriented techniques), possibly at the price of sacrificing result quality, or to cope with limited data knowledge and data heterogeneity (QoD-oriented techniques), with the aim of improving the quality of results. While both kinds of approximation techniques have been proposed, most adaptive solutions are QoS-oriented.

Additionally, techniques which apply a QoD-oriented approximation in a QoD-oriented adaptive way (called adaptively approximate techniques), though demonstrated potentially useful in getting the right compromise between precise and approximate computations, have been largely neglected. In this talk, after presenting and classifying several approximate and/or adaptive query processing approaches, proposed for different distributed architectures, we show, with some concrete examples, the benefits of using adaptively approximate techniques. We then present the result of our ongoing research in the context of data stream and geo-social data management.