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●S. Babu and J. Widom.

System

U. Srivastava and J. Widom.Flexible Time Management in Data Stream Systems

In Proc. of the 2004 ACM Symp. on Principles of Database Systems (PODS 2004), June 2004

Flexible application-defined time poses challenges to a Data Stream Management System, since streams may be out of order and uncoordinated with each other, they may incur latency reaching the DSMS, and they may pause or stop. We formalize these challenges and specify how to generate heartbeats so that queries can be evaluated correctly and continuously in an application-defined time domain. Our heartbeat generation algorithm is based on parameters capturing skew between streams, unordering within streams, and latency in streams reaching the DSMS. We also describe how to estimate these parameters at run-time, and we discuss how heartbeats can be used for processing continuous queries.

B. Babcock, M. Datar, and R. Motwani.Load Shedding for Aggregation Queries over Data Streams

In Proc. of Intl. Conference on Data Engineering (ICDE 2004), March 2004

We present load shedding techniques for a restricted class of stream queries: Aggregation queries over sliding windows, possibly with selections, projections and foreign key joins with stored relations. We present optimal solutions for placing load shedders (operators which randomly drop tuples) in the query plan, which reduce the load on the system below the required threshold, while minimizing the inaccuracy introduced in the queries.

D. Thomas and R. Motwani.Caching Queues in Memory Buffers

In In Proc. of the Annual ACM-SIAM Symp. on Discrete Algorithms (SODA 2004), January 2004

We study the problem of maintaining queues in a cache, which occurs in a number of important settings like DataStream systems, Network Router design and Distributed Messaging services. We analyze why DataStream systems built on top of buffer managers that use traditional algorithms like LRU perform badly. We provide online competitive algorithms for this problem for different interesting cost models.

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