

ΠΡΟΤΑΣΗ ΔΙΠΛΩΜΑΤΙΚΗΣ ΕΡΓΑΣΙΑΣ

ΘΕΜΑ

Scaling Geometric Monitoring over Distributed Streams

Keywords

Data Streams, Distributed Systems, Geometric Monitoring, Safe Zones, System Scalability

Περίληψη της εργασίας

Scope of the thesis is to tackle the scalability problem observed on a distributed stream system's node population during Geometric Monitoring application.

Based on a push paradigm, we have to deal with continuous, high volume dynamic data streams in real time and apply Geometric Monitoring methods as described in [1],[2],[3],[4],[5]. Experimental results in these works show that the proposed monitoring solutions suffer from lack of scalability, i.e. efficient for up to 10 nodes compared to the naive, centralized method, efficiency referring to communication cost. We aim at increasing the scalability of these algorithms via sophisticated prediction models and asynchronous algorithmic proposals, the main concern being low communication overhead.

Στόχοι

Goals of the thesis are:

- display theoretical evidence on why existing algorithms lack scalability
- propose solution to the scalability problem via asynchronous algorithms and sophisticated prediction models
 - assume simple case depicting reality
 - research a solution
 - extend to more general case
- theoretical (probabilistic) evidence that the proposed solution works
- implementation of proposed solution
- experimental results on real data, comparison with existing methods

Τεχνολογική/θεωρητική σημασία

The value of this thesis lies in developing an algorithmic solution that can be used in distributed systems with large node size while retaining efficiency, i.e. “low” communication overhead.

Βιβλιογραφία

[1] *A Geometric Approach to Monitoring Threshold Function Over Distributed Data Streams*, Sharfman, Schuster, Keren

[2] *Approximate Continuous Querying over Distributed Streams*, Cormode, Garofalakis

[3] *Sketch-based Geometric Monitoring of Distributed Stream Queries*, Garofalakis, Keren, Samoladas

[4] *Optimal Local Constraints for Distributed Stream Monitoring*, Keren, Sagy, Abboud, Ben-David, Sharfman, Schuster

[5] *Prediction-Based Geometric Monitoring Over Distributed Data Streams*, Giatrakos, Deligiannakis, Garofalakis, Sharfman, Schuster