Thesis title: Data Stream Mining with the PRAAG change detection algorithm

Thesis description: This Master project is about the learning from Big Data in form of data streams where both memory and time efficiency are critical. More specifically, the task is to detect when the underlying data distribution of the stream has changed so that appropriate measures can be taken. Data stream mining differs from traditional data mining in that data is generated at a high speed so that it is impossible to store and then analyse the data sufficiently fast using traditional methods due to the limited computational resources. Thus, used algorithms must be both fast and memory efficient. In this thesis, the student is expected to further develop and evaluate a memory-based algorithm for change/concept drift detection developed at SICS, where expected tasks in the project are:

1. Write a state-of-the-art report in change/concept drift detection
2. Investigate approaches to efficiently store and compute the anomaly scores of the algorithm
3. Contribute an open source C++ implementation of the PRAAG algorithm (there exists a Java implementation with limited functionality)
4. Evaluate the performance of the algorithm both in terms of detection accuracy and performance in memory and time compared to state-of-the-art algorithms.

Competence: We are looking for a MSc student who has fulfilled the course requirements. Good C++ programming skills are required, as is good spoken and written English. Experience with data mining or machine learning is a plus. Applications should include a brief personal statement, CV, and a list of grades. In the application, make sure to mention previous activities or other projects that you consider relevant for the position. Candidates are encouraged to send in their application as soon as possible. Suitable applicants will be interviewed as applications are received.

Start time: As soon as possible
Location: SICS Swedish ICT, Västerås

About SICS
SICS Swedish ICT is a leading research institute for applied information and communication technology in Sweden. SICS is a part of Swedish ICT Research AB, a non-profit research organization owned by the Swedish government and industry. SICS’ mission is to contribute to the competitive strength of Swedish industry by conducting advanced and focused research in strategic areas of computer science, and actively promote the uptake of new research ideas and results in industry and society at large. SICS is an active participant in collaborative national, European, and other international R&D programs.

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