TECHNOLOGY

Method and Apparatus for Analyzing Co-Evolving Time Sequences

OVERVIEW

In many applications, data of interest comprises multiple sequences that each evolves over time. Examples include currency exchange rates, network traffic data from different network elements, demographic data from multiple jurisdictions, patient data varying over time.

These sequences are not independent; in fact they frequently exhibit a high correlation. Therefore, much useful information is lost if each sequence is analyzed individually. It is therefore desirable to be able to analyze the entire set of sequences as a whole, where the number of sequences in the set can be very large. For example, if each sequence represents data recorded from a network element in some large network, then the number of sequences could easily be in the several thousands, and even millions.

It is typically the case that the results of an analysis are most useful immediately, based upon the portion of each sequence seen so far, without waiting for "completion." In fact, these sequences can be extremely long, and may have no predictable termination in the future. What is required is to be able to "repeat" the analysis as the next element (or batch of elements) in each data sequence is revealed. This must be done on potentially very long sequences, indicating a need for analytical techniques that have low incremental computational complexity.

One embodiment of the present invention is an analyzer system that analyzes a plurality of co-evolving time sequences to, for example, perform correlation or outlier detection on the time sequences. The plurality of co-evolving time sequences comprise a delayed time sequence and one or more known time sequences. A goal is to predict the delayed value given the available information. The plurality of time sequences have a present value and (N-1) past values, where N is the number of samples (time-ticks) of each time sequence.

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Additional Information

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PATENT STATUS

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LICENSE STATUS

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CATEGORIES

- Information Technology

EXTERNAL RESOURCES

- US Patent 6,055,491

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