

Implementation of Data Compression Algorithm BASED on SILAB

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Bridge is an important part of the communications and transportation network, and the vein of national economics. Thus, it is crucial to insure the safe reliability of bridges construction. The collapse of bridge will bring huge economic loss and damage to the nation. It has great significances for analyzing and comprehending the working condition or abnormally variations, realizing pre-alarm of accidents, preventing unexpected disaster, avoiding casualties, ensuring safety of basic installations to gain and monitor the condition parameter of bridges, and evaluate the safety.

This article elaborates the importance and characteristics of processing data compression by analyzing the features of historical data and monitoring parameters in bridge safety monitoring system. Analysis of monitoring parameter characteristics in bridge safety monitoring system. It also presents the theory of PLOT, SDT and the improved STD algorithm, and comparatively analyses them by practicing the SILAB, plans to compress the historical data in bridge safety monitoring system.

In Section 1 of this paper, Analysis of monitoring parameter characteristics in bridge safety monitoring system.

(1) Main monitoring of store period in bridge safety monitoring system.

As condition parameters, the variation rate of vibration, straining, temperature, ect. are slower than the sample rate of monitoring system. So, it takes a long time to store these data.

(2) Storing condition parameter is to analyzing the data variation trend such as vibration, they should be record while the data storing.

(3) the output results of Hongfeng Lake sensor shows that

the variation of these condition parameter is slow and a lot of redundancy data are existed. The contiguous data in the bridge condition parameter are relative.

Section 2 puts forward the importance and characteristics of data compression

To sum up, it is necessary to compress the relative data. As the development of computer technology and the sensor technology, it becomes require higher and higher efficient of safe

production, which lead to the explosion of processing data. Processing data is kind of information resources which could be applied to all kinds of processing operation and controlling task to store a great quantity of processing data. Processing data trending is to save the store space for the communication flow decreasing of processing data transportation. It is important for the spot controlling system.

Section3 introduces the theory of PLOT,SDT and improved STD algorithm and compares them.

Processing data compression methods mainly include Section Linear Trending and Signal Conversion Trending. Section Linear compression includes Boxcar Trending, SDT and PLOT(Piecewise Linear Online Trending).

The theory of PLOT,SDT and improved STD algorithm. PLOT was proposed by Mah and aimed to find all the main trend in the given y_1 which is a time alignment for a processing measured data. Or is PLOT uses the section linear to obtain the maximum data compression. Swing Door Trending could damage the data. It means only every data received by system last time is not in the threshold value, these data will be record when the system receives a new data. The non-detection, the way of dealing with aberrant points and the choosing of parameter E of STD give great influence to the data compression. The performance of STD would be low under the circumstance of noise and aberrant points. so in order to apply the STD well to the bridge safety monitoring system, it could adjust the coefficient to improve data compression algorithm.

Section4 introduces the algorithm implement based silab

SCILAB is the scientific engineering calculation software of the open-source developed by the French National Institute of Information and Automation (INRIA). As one of the most famous scientific computing software, SCILAB has a wide range of applications, and has the characteristics of the stable operation, occupying fewer computer resources, running faster and so on. Because of its rich data types, it is easy to achieve various matrix computing and graphics and can be used in the field of scientific computation, mathematical modeling, signal processing, optimizing the decision-making, linear / nonlinear control, and other aspects. It also provides the toolbox which can satisfy the needs of engineering and science. So SILAB is used in programming to actualize algorithms. Comparatively analyses them by practicing the SILAB, plans to trend the historical data in bridge safety monitoring system.

Section 5 concludes this paper.

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