IN FAULT DETECTION AND RELIABILITY ENHANCEMENT ALGORITHM FAILURE CALCULATION METHODS

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ABSTRACT

It uses a multivariate experimental modeling algorithm to obtain a mathematical description of the electrical behavior of the system and the method in the presence of a fault current (Fig. 3.4). The algorithm compares the modeled result with the measured result and quantifies the resulting parameter comparison by obtaining the relevant signals. The identified input signals are fed to the artificial neural network and the process speed is fed to the convolutional system.

Keywords: weaving machine, neural network, electric motors, reliability, textile machine, methodology, differential and algebraic equations.

A convolutional network is a class of higher order neural networks that are often used in signal analysis. Convolutional neural networks develop a classification of multi-layer faults and a method of their elimination using convolution operations.

By loading the fault tracker, it is possible to check for electrical and mechanical faults in electrical circuits. The probability of failure during certain working hours is determined based on a multivariable experimental modeling algorithm.

A special algorithm has been developed for the <error not detected> part of the display when generating the fault classification. In this case, a program algorithm was created to calculate the reliability indicators based on the N M X(I,J) input

M is the number of matrix columns;
N - number of rows;
J – column number;
I - line number;
X(I,J) – array elements;
N (J) – statistical average (mathematical expectation);
S(J) – standard deviation;
V(J) – coefficient of variability;
R (J) is the relative value of mathematical expectation;

av - output coefficient;

aT - coefficient of technical preparation;

S(J) is the sum of elements of the data array

If an expected failure is detected, the diagnostic monitor evaluates the measured parameters of the engine, develops a diagnosis of the component that has detected a deviation from the reference value. Another aspect of this algorithm is that it is useful in high-load electric motor manufacturing and quality control testing.

Results of statistical data processing of weaving machine electric drive

Characteristics of weaving machine reliability	**Time to stop the weaving machine**				
	Working in line Nl	**Technical service**	**Repair**	**Technical reasons**	**Organizational reason**
The relative value of mathematical expectation	0,803	0,013	0,133	0,023	0,028
Coefficient of variation	0,019	0,525	0,149	0,159	0,352
Standard deviation	0,803	0,013	0,133	0,023	0,028
Mathematical expectation of the number of motors of a weaving machine in state N j-m	283,44	4,5	47,13	8,06	9,87

To train the neural network tracker, it is necessary to use the three-phase induction motor stator current and voltage as the data set. In the case of a symmetric electric machine, the phase currents and voltages have phase shifts of 1200, so that the signals from the current and two-phase voltage transmitters are sufficient for the completeness of finding the correlation relations between the input and output data. In addition to the data coming from the transmitters of the neural network tracker, their interception is carried out, and it is transmitted to feedback from the tracker itself, that is, to estimate the angular speed of the engine [2]

A modeling block scheme has been developed to approximate the data obtained in the modeling block to the data obtained from the real object.

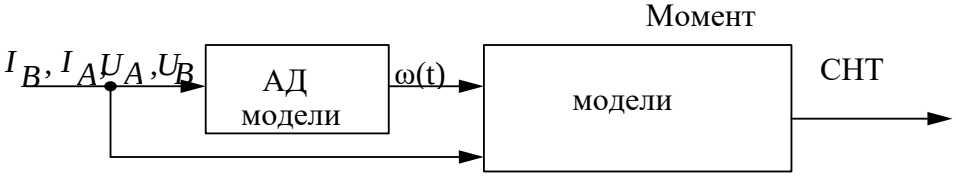

Figure 1. Block diagram of modeling

After choosing the architecture of the artificial neural network (SNT), the process of installation in the MATLAB software environment begins, and cyclic adjustments are introduced to its basis by choosing the coefficient of synoptic weights in such a way that, according to it, the differences between the signal of the rotor angular speed sensor and the reaction of the SNT to the relevant incoming data are minimized.

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