Claims:

1. A method for determining an error threshold value when a vector distance based error measure is to be used for machine failure prediction, the method comprising: inputting a plurality of basic memory depth values based on a target sequence to be used to calculate a machine failure prediction into a computer operable memory storage device through use of a processor connected within at least one computer system;

an average depth value based on the plurality of basic memory depth values the calculation performed by the processor;

retrieve an elementary error threshold value, a plurality of corresponding mappings and a corresponding predetermined depth value from a pre-stored data base table stored in a computer operable memory;

inputting an elementary sequence of a machine failure sequence associated with a predetermined depth value based on the average depth value, wherein the elementary sequence includes a plurality of zeroes and a plurality of ones, said determining performed by the processor;

selecting a first fixed value and a second fixed value through use of the processor;

generating a predicted sequence of a machine failure by replacing the plurality of ones of the elementary sequence with the first fixed value and then replacing the plurality of zeroes with the second fixed value, said replacing performed by the processor;

calculating an approximate value based on a vector distance between the elementary sequence and the predicted sequence, the determining performed by the processor;

calculating an elementary error threshold value corresponding to the elementary sequence of the machine failure sequence with the predetermined depth value based on the approximate value, said calculating performed by the processor;

generating an error threshold value corresponding to the target sequence based on both the determined elementary error threshold value and a standard deviation, represented as δ, of the plurality of basic memory depth values by the processor;

initiating training of a recurrent neural network based on the plurality of basic memory depth values;

comparing the calculated vector distance with the predetermined error threshold after each epoch during training;

continuing to train the RNN until the calculated vector distance is less than the predetermined error threshold; and

stopping the training of the RNN when the calculated vector distance is less than the predetermined error threshold.

2. The method according to claim 1, wherein the average depth value and the predetermined depth value are a same value.

3. The method according to claim 1, wherein the average depth value and the predetermined depth value are a different value.

4. The method according to claim 1, wherein the error threshold value corresponding to the elementary sequence of the machine failure sequence with the predetermined depth value is based on a predetermined constant coefficient.

5. The method according to claim 4, wherein the predetermined constant coefficient is 1/1800.

6. The method according to claim 1, wherein determining, by the processor, an elementary error threshold value corresponding to the elementary sequence of the machine failure sequence with the predetermined depth value based on the approximate value is accomplished by experimentation.

7. The method according to claim 1, wherein the first fixed value is 0.974 and the second fixed value is 0.026.

8. The method according to claim 1, wherein the target sequence is a composite sequence which includes a plurality of different basic memory depth values.

9. A system for determining an error threshold value when a vector distance based error measure is to be used for machine failure prediction, the system comprising: a computer system having a processor and a at least one memory communicably coupled thereto, wherein the at least one memory is configured to store data to be executed by the processor, wherein the processor is configured to:

input a plurality of basic memory depth values based on a target sequence to be used for machine failure prediction into a computer operable memory through used of the processor;

select an average depth value based on the plurality of basic memory depth values;

generate an elementary sequence of a machine failure sequence associated with a predetermined depth value based on the average depth value, wherein the elementary sequence includes a plurality of zeroes and a plurality of ones through use of the processor;

receive a first fixed value and a second fixed value;

generating by the processor, a predicted sequence by replacing the plurality of ones of the elementary sequence with the first fixed value and replacing the plurality of zeroes with the second fixed value through use of the processor;

generate an approximate value based on measuring a vector distance between the elementary sequence and the predicted sequence;

determine an elementary error threshold value corresponding to the elementary sequence of the machine failure sequence with the predetermined depth value based on the approximate value;

determine an error threshold value corresponding to the target sequence based on the determined elementary error threshold value and a standard deviation of the plurality of basic memory depth values;

initiate training of a recurrent neural network based on the plurality of basic memory depth values;

compare the calculated vector distance with the predetermined error threshold after each epoch during training;

continue to train the RNN until the calculated vector distance is less than the predetermined error threshold; and

stop training the RNN when calculated vector distance is less than the predetermined error threshold.

10. The system according to claim 9, wherein the average depth value and the predetermined depth value are a same value.

11. The system according to claim 9, wherein the average depth value and the predetermined depth value are a different value.

12. The system according to claim 9, wherein the error threshold value corresponding to the elementary sequence of the machine failure sequence with the predetermined depth

value is based on a predetermined constant coefficient and the standard deviation of the plurality of basic memory depth values in the target sequence.

13. The system according to claim 12, wherein the predetermined constant coefficient is 1/1800.

14. The system according to claim 9, wherein the first fixed value is 0.974 and the second fixed value is 0.026.