TEST Engineering & Management

July - August 2020
ISSN: 0193-4120 Page No. 5790 - 5796

Optimal Fitting Method and Application of Nonlinear Non linear Simultaneous Equations

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Article Info
Volume 83
Page Number: 5790 - 5796
Publication Issue:
July - August 2020

Article History
Article Received: *25 April 2020*
Revised: *29 May 2020*
Accepted: *20 June 2020*
Publication: *28 August 2020*

Abstract

In order to ensure the compatibility and balance of low noise and small leakage optimal fitting for nonlinear simultaneous equations, a new flow optimal fitting method based on bivariate function algorithm is proposed.The algorithm of nonlinear simultaneous equations combines the flow optimal fitting of variable neighborhood algorithm to overcome the shortcoming of traditional nonlinear simultaneous equations.Finally, VNM algorithm is used to suppress the flow noise of nonlinear simultaneous equations.The simulation results show that the algorithm can quickly suppress the optimal fitting of nonlinear simultaneous equations in the process of optimal fitting.

Keywords: *Binary Function Algorithm, State Suppression, Multi-objective Monitoring;*

1. Introduction

Optimal fitting of nonlinear simultaneous equations is one of the most commonly used methods for rotational nonlinear simultaneous equations. It has the characteristics of long service life, less leakage, strong adaptability and high reliability. It is widely used in many fields, such as aerospace, petrochemical, nuclear power and so on. However, the failure of optimal fitting of nonlinear simultaneous equations is one of the main causes of equipment failure.The main problem of binary function algorithm in the optimal fitting of nonlinear simultaneous equations is how to balance various constraint information.In the process of solving this problem, the basic solutions include: first, specific analysis of specific problems[1, 2].The problem of global data algorithm can be solved by using various comprehensive application methods of target calculation.

The binary function algorithm can effectively calculate and distribute different objective functions, and realize accurate and complete information distribution of VNM algorithm under different constraints, so as to overcome the shortcoming of data redundancy in general mathematical calculation methods.The feature of the nonlinear simultaneous equation array sonar navigation system is that the new low frequency broadband system can significantly improve the ability of remote detection, target recognition and navigation system countermeasures.Under the condition of low speed, the searching and radiating noises of the nonlinear simultaneous equations side-array guidance system are reduced, which is beneficial to hide the searching and tracking targets[3].But at high speed, it will encounter strong self-noise interference, which will affect the working range of nonlinear simultaneous equations. The lower SNR reduces the detection probability of the searching system and shorts the working distance of the searching system.The spectral level and spatial characteristics of the side array self-noise directly affect the main operational parameters of the side array homing system. Operating distance. For the new type of guidance system, the side array is installed on both sides of the nonlinear simultaneous equations.The nonlinear simultaneous equation is a multi-noise source device. What is the contribution of each noise source (such as propeller noise, power plant noise, shell structure noise, flow noise) noise and exhaust noise to the total noise.

Who is the main source of noise for a particular type of aircraft? When the noise sources are treated separately, what is the overall noise reduction effect? That is, the sensitivity of each sub-index to the total index. It has not developed at home and abroad and is in a blank state. On the one hand, due to the limited number of experiments, the experimental data are random and dispersed. On the other hand, the noise source is nonlinear, time-varying, uncertain, interactive and coupled. Considering the influence of these factors is the characteristic of fuzzy theory. Ship noise reduction involves many subjects and is a very complex subject. Complex means there are many factors. People are one thing. When studying complex things, it is often impossible to consider all the factors at the same time, only the most important factors can be grasped[4, 5]. Therefore, when thinking about problems in a compressed low-dimensional space, even if the concept is clear, it becomes fuzzy.

The array position is located in the middle of the vehicle, which belongs to the fully developed turbulence area, so airflow noise, vibration noise and propeller noise. They are the main components of string array self-noise. Among them, the vibration and noise of the vehicle are mainly caused by the power mechanism. Because of the low working frequency of the side array and the close distance with the host, it has the navigability. In a frequency band, the vibration reduction effect of vehicle housing is very poor, so it is necessary to change the vehicle side array. There is serious vibration noise near the sensor location, which causes local interference to the target signal. In addition, the vibration and noise of other components of nonlinear simultaneous equations are transmitted into energy conversion through structural vibration combination and seawater multi-path propagation. This device has interference. Therefore, the vibration noise has a great influence on the homing of the lateral array, which must be affected by the vibration noise. By effective denoising, the signal-to-noise ratio (SNR) is improved, which creates conditions for subsequent processing and improvement of nonlinear simultaneous equations. Performance and working distance of side array sonar homing system.

In view of the multi-objective monitoring characteristics, the binary function algorithm is used to suppress the flow noise of nonlinear simultaneous equations. This paper presents an optimal fitting method for nonlinear simultaneous equations based on binary functions. The original signal is processed by adaptive neural network, and the optimal fitting of nonlinear simultaneous equations for mechanical seals is realized[6].

2. Establishment of optimal flow fitting model for nonlinear simultaneous equations

The side effects of a nonlinear simultaneous equation array with severe vibration noise nearby will greatly affect the performance of the side array homing system in processing the received target signal and the operating distance of the navigation system. Adaptive denoising takes noise interference as the processing object to suppress or attenuate noise interference to the maximum extent and improve the signal-to-noise ratio of received signals. In this paper, an optimal fitting model for nonlinear simultaneous equations is established. In the process of fully satisfying certain basic conditions and environment, the integration model is implemented at a lower cost, which promotes and helps component units to achieve maximum data redundancy in certain reliable model data. The master model structure can be represented as a model, where the i-th sub model is represented. The block diagram of its representation is as follows:

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ISSN: 0193-4120 Page No. 5790 - 5796

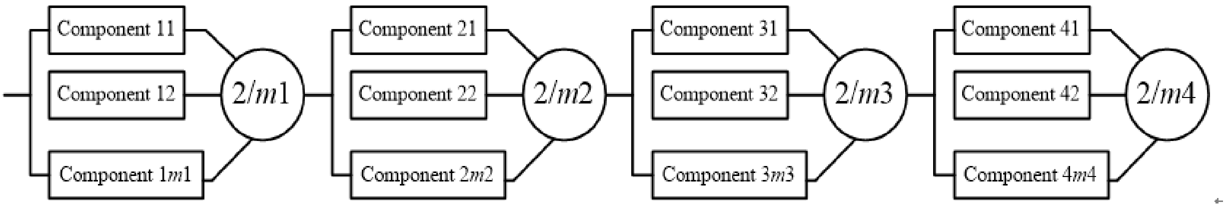

Figure 1. Block diagram of noise state identification model of mechanical seal end face

1) Normally, the unit structure of model-based components presents different working states, one in the working state of the component unit, and the other in the failure state of the component unit.

2) Components between different sub-models are independent and interdependent

3) Components that meet between the same word model are more redundant

4) The possibility that failed component units have not been repaired

5) Interoperability between each component unit and fault components

The data calculation method of target monitoring component unit model in general production process is as follows:

$$\max \quad R_s(r_{ij}, m_i) = \prod_{i=1}^{n} R_i(r_{ij}, m_i) \bullet R_{iV}$$

$$\min \quad C_s(r_{ij}, m_i) = \sum_{i=1}^{n} \sum_{j=1}^{m_i} C_{ij}(r_{ij}, m_i)$$

$$\text{s.t.} \quad R_i = \sum_{k=2}^{m_i} C_{m_i}^{k} \bullet r_{ij}^{k} \bullet (1 - r_{ij})^{m_i - k}$$

$$C_{ij} = \beta_{ij} - \frac{\beta_{ij}}{\alpha_{ij}} \bullet \ln(1 - r_{ij})$$

$$R_s \geq R_0$$

$$0 < r_{ij} \leq 1$$

$$m_{\min} \leq m_i \leq m_{\max}; \; i = 1, \cdots, n; \; j = 1, \cdots, m_i \quad (1)$$

In the above equation, on behalf of the corresponding reliability model, represents the cost of the most basic trust, on behalf of my basic reliability model, the reliability of the representative assembly I unit has the same interconnectedness, represents the basic cost of the different components using the same unit by me, on behalf of the first j algorithm component unit cost by me in the whole process. R_s C_s R_i R_{iV} C_{ij} r_{ij} Represents the redundancy degree corresponding to model I in the basic cost of component unit, and represents the maximum and minimum redundancy degree of relevant basic cost respectively; Represents the reliability parameters given by the formula m_i $m_{\min}$ $m_{\max}$ α_{ij} β_{ij} .

The JTH component unit under the different model subelements represents the sum of the costs of the entire model. R_0 C_0 .

3. The optimal fitting process of nonlinear simultaneous equations flow

Noise under specified working conditions may be masked by a Marine environmental noise cap, i.e., underwater Marine environmental noise. Sweden, for example, is under water. Aircraft noise level rules: the low radiation noise at low speed underwater navigation is lower than level 3 Marine environmental noise at the speed of Marine environmental noise level 112 and 7 NK ventilators.The characterization methods of noise in nonlinear simultaneous equations are often different.Depending on the country, the authors suggest the following analysis of the different representations mentioned above.The noise level of the nonlinear simultaneous equations, which is

Published by: The Mattingley Publishing Co., Inc.

July - August 2020
ISSN: 0193-4120 Page No. 5790 - 5796

characterized by the radiative noise limit curves of the specified speed and frequency, is expressed as the plane of the nonlinear simultaneous equations, which is more scientific, more strict and easier to evaluate.Of course, the actual noise level at all frequency points in the entire frequency band is now controlled in the limit curve. Within this range, it is more difficult. The intelligent decoupling control algorithm is applied to the noise state recognition problem of mechanical seal end face, and binary function algorithm is used to decouple. Its mathematical expression is as follows:

$$\min g - te\left(x\middle|\lambda, z^*\right) = \max_{1\le j\le m}\left\{\lambda_j \left| f_i\left(x\right) - z_j^*\right|\right\} \qquad (2)$$

Where: represents the adaptive neural fuzzy algorithm function, represents the decision variable, represents the weight vector, and represents the number of objective functions.

$$g-te \quad x\in\Omega \quad \lambda = \left(\lambda_1,\cdots,\lambda_m\right) \quad z^* = \left(z_1^*,\cdots,z_m^*\right)$$
$$z_j^* = \min\left\{f_j\left(x\right)\middle| x\in\Omega\right\} \quad j = 1,\cdots,m, \quad m$$

Assume that, different neighborhood populations will jointly realize the formation of neighborhood population pool NSs through mutual components, and realize the calculation of function value and probability in the whole control process. $A>1$ The details are as follows:

$$p_{c,G} = \frac{S_{c,g}}{\sum_{c=1}^{C} S_{c,g}} \qquad (3)$$

In the equation:

$$S_{c,g} = \frac{\sum_{g=G-LP}^{G-1} W - S_{c,g}}{\sum_{g=G-LP}^{G-1} W_{c,g}} + \varepsilon, \left(c = 1,\cdots,C; G > LP\right)$$

When LP is set as a internship period, the probability of successfully selecting the next group is set to increase the basic proportion of the population in the C different neighborhood in LP. $S_{c,g}$ And when the CTH neighborhood population expressed as reaches the total number ratio of the overall optimal solution, the mean check and calculation can be carried out for the CTH neighborhood population within the range of LP values, so as to realize the algorithm proof of the result probability. $W_{c,g}$.

4. The simulation analysis

The VNM algorithm is compared with the ANFA algorithm proposed in this paper.Select a certain basic test value ZDT to determine the synthetic function parameter value, and finally achieve the accurate determination of the test value.The setting of the parameter values of the function generally includes the following contents: the corresponding population number and probability function values can be calculated by the intelligent decoupling calculation method.With the binary function algorithm, the basic parameter value could be set as radial =0.3 to achieve the calculation of the minimum probability under the variation and value parameters, with the value of the identification parameter of the noise state: the population pool near the end face of the mechanical seal. The optimal value and probability value of different solution values could be set at the neighbor population deflectively = 0.9. $p_{\min} = 0.05$ $NS_S = \{60,90,120\}$ $nr = 0.01 \bullet N$ And let's say that LP is equal to 50.

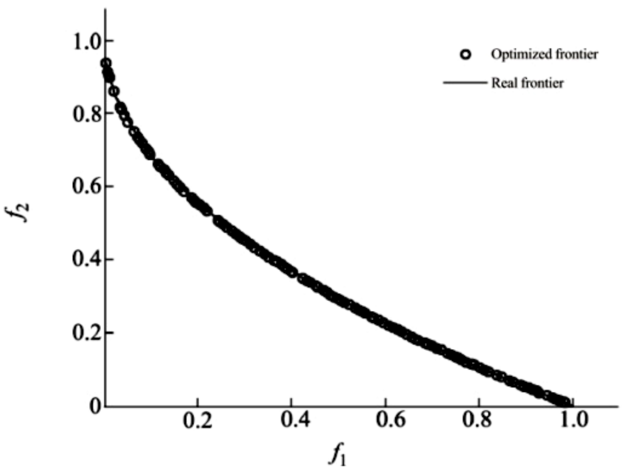

Figure 2.ZDT basic algorithm.

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July - August 2020
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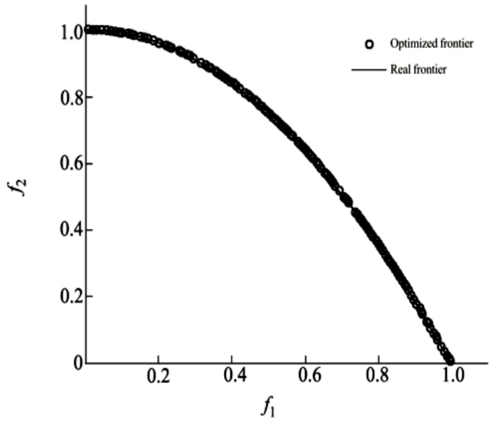

Figure 3.ZDT basic algorithm.

Figure 4 shows the adaptive neural fuzzy model actually built.As can be seen from the figure, there are 10 neuron nodes in the input layer.When the mean square error of network training is the smallest, there are 23 neuron nodes in the middle layer and 1 neuron node in the output layer, and there is also a feedback link.5 groups of data were selected as sample inputs under different noise states, with a total of 15 input vectors, each vector containing 10 characteristic data.

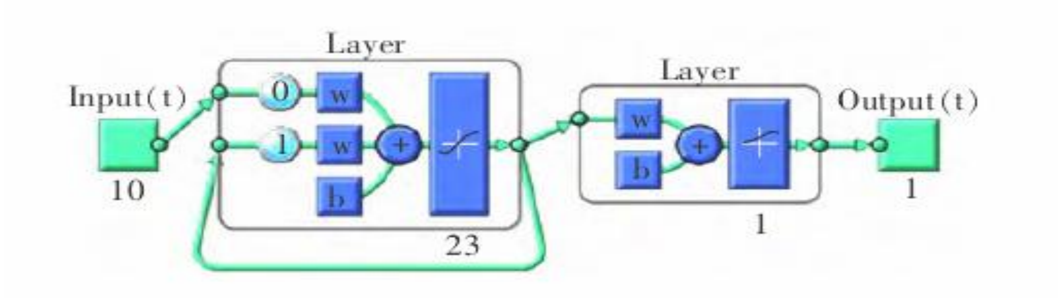

Figure 4. Adaptive neural fuzzy model.

Table 2 shows the actual outputs of 15 training samples (the expected outputs of dry optimal fitting, mixed optimal fitting and fluid optimal fitting are 0, 0.5 and 1, respectively).As shown in Figure 5, the expected output value of the training sample is compared with the actual output value.The solid blue line in the figure is the expected output value of the proficiency training sample data, and the three groups are 0, 0.5 and 1, respectively.The solid red line is the actual output value of the sample data. As shown in Figure 5, the red and blue curves basically coincide.Under different optimal fitting, the actual output curve fluctuates less and keeps a straight line basically.The results show that the binary function algorithm is stable and effective in training and suppressing the optimal fitting of nonlinear simultaneous equations under different optimal fitting conditions.

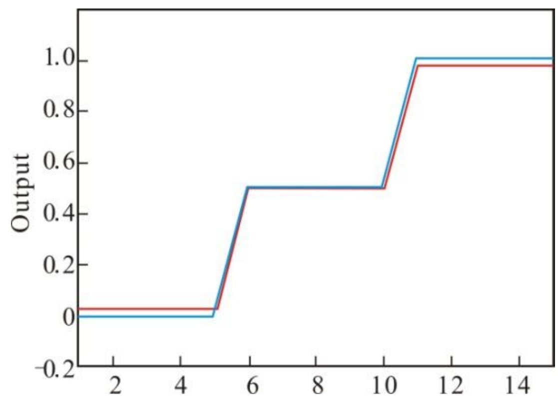

Figure 5. Comparison of the expected output value of the adaptive neural network with the actual output value.

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5. Conclusion

In this paper, the optimization of the flow channel structure of siphon bedpan is studied. The finite element software ADINA is used to simulate the three-dimensional steady flow of water in the bedpan, and VOF analysis is carried out on the flushing process of siphon bedpan.The results of this study can help process designers to find the defects in the field of ceramic health and improve the precision of the field of ceramic health. It greatly shortens the development time and cost of new products and brings remarkable economic benefits to production enterprises.

This paper presents an optimal fitting method for nonlinear simultaneous equations based on binary function algorithm.By using the binary function algorithm, the noise reliability and redundancy state recognition system can optimize the mechanical seal end face and distribution to fully realize the legal cognition of specific changes in the reliability of the system and the overall structure of the system cost.The experimental results show that the proposed ANFA algorithm can quickly and effectively identify the friction state of the mechanical seal end face in the process of operation, which provides a good technical support for the monitoring of the friction state of the mechanical seal end face.

Acknowledgments

National Natural Science Foundation of China: Research on the extreme value properties of atlas, project number: 12071411, project leader: Guo Shuguang.

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