

Method of Parametric Identification of Macro Model in Kind of Interval Difference Operator Based on Data Dividing

Taras Dyvak

Abstract - The paper considers the problem of parametric identification of nonlinear difference operator with interval data. Proposed and justified algorithm for solving this problem it use part experimental data and validating model with all experimental data.

Keyword - parametrical identification, differential operator, interval.

2. setting the current evaluation parameters vector differential operator randomly;
3. implementation of the recurrent scheme to obtain

Taras Dyvak - Ternopil National Economic University, Yunosti Str. 9, 46020 Ternopil, Ukraine E-mail: dtaras80@mail.ru

I. INTRODUCTION

Recently, a particularly actual problem of minimizing contamination layer of the atmosphere harmful emissions vehicles. One way of solving, this problem is control pollution vehicles with appropriate compensation as a tool for reducing the most pollution and their negative consequences. Emissions from vehicles are the fields of concentrations of harmful substances. So to solve this problem, we need to find a universal method to predict the level of placement harmful substances fields for specific conditions in space and time. Macromodelling in the form of difference operators is often one way for representing the properties of such fields. Differential operator can be used to describe the fields of concentrations of harmful emissions vehicles. In the final case, the search parameters difference operator reduces to the solution of nonlinear system of algebraic equations. Currently, there are no methods which in a short time calculate system of nonlinear algebraic equations of large dimension.

II. TASK OF PARAMETRIC IDENTIFICATION OF MACRO MODEL WITH USING METHOD BASED ON DATA DIVIDING

The research goal is to develop a method that allows for minimal time to find the parameters for difference operator for macromodelling fields of concentrations of harmful emissions in space and time.

The basis of computing schemes put the three-step procedure:

1. setting the initial conditions as the initial interval approximations of discrete values predicted characteristics;

interval evaluations of discrete predictable characteristics and test "quality" of the current evaluation parameters vector differential operator. This prediction will use part of experimental data. Other part of this data will be used for validation previous prediction.

III. CONCLUSION

Actually the main objective of the study is the optimization method for determine quality of current evaluation parameters. It uses algorithms that are based on vector memory [1]. The main problem of existing algorithms [2,3] is that they all are based on using all experimental data. So, too much experimental data are hurting performance of these algorithms. I proposed new algorithm which are based on data dividing. The main idea of that is using some part of experimental data for prediction, and other – for validating quality of current evaluation parameters. As a result of investigations it will give best performance for solving tasks of parametrical identification.

REFERENCES

- [1] Rastrigin L.A., "Adaptation of complex systems", Riga: *Zinatne*, (1981), pp. 65-90.
- [2] Dyvak M., Martsenuk E. and Voytuk I., "The optimal procedure for setting parameters of the method of identification of intervalmodels of discrete dynamical systems", *Information processing*, 2008, No 27 (103), pp. 17-23.
- [3] Dyvak M. and Dyvak T., "Features of construction of interval systems of algebraic equations", *Inductive modeling of complex systems*. Collected Works., 2009, pp. 35-43.