

## Problems of Synthesis of Adaptive Filters by Genetic Algorithms Methods

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**Abstract.** When solving the problem of emission of stable signals with a constant spectral composition, it is necessary to synthesize the equation of the corresponding signal model. For synthesis, it is proposed to use one of the varieties of genetic algorithms — the method of group accounting of arguments (MGAA). In fact, the equation synthesized by this method is an optimal filter — a particular representation of the Lotka–Volterra series expansion. Obtaining the result of decomposition is the result of the work of the genetic algorithm. Problems in the synthesis of the optimal filter are the data separation rule, the rule for generating candidate models, the method of obtaining model coefficients and the form of the quadratic model selection criterion.

The article provides algorithms for solving these problems, implemented in C++ and running under the MSWS operating system. Of particular interest is the modified Seidel algorithm for determining the coefficients of the optimal model, capable of working with poorly defined matrices having a determinant value close to or equal to zero.

**Keywords:** synthesis of an optimal filter, method of group accounting of arguments, systems of linear equations, genetic algorithm