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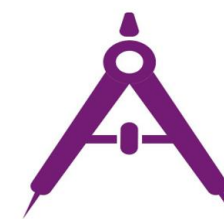


«Metrological Support of Innovative Technologies» ICMSIT-2020

«Development of Levenberg-Marquardt theoretical approach for electric networks»

Authors

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Problem statement

- write a description of each alternative development of electrical networks (ARES) based assessment criteria characterizing economic technical, efficiency level reliability and unification of decisions, their compliance social and environmental requirements. For this develop mathematical models of criteria and calculate their values for each alternative, using the parameters of the elements of electric power lines readings and objects of electrical substations (length, line type; number of lines and chains; type of support, etc.).
- form for training a neural network data set containing criteria values scores for each alternative and class number, to which ARES belongs;
- choose the type of neural network and algorithms training corresponding to the task of classification; determine the range of hidden layers and new to them;
- choose metrics that determine effective classification of ARES by neural networks various architecture and training algorithms;
- experimentally determine the best training algorithm and optimal PA dimensions of the ANN architecture.

Solution methods

- To obtain indicators, characterize the effectiveness of alternatives sponsored by system of criteria for assessing ARES has been laid down.
- The method is based on existing general theoretical substation criteria models (PS) and power lines (power lines).

Conclusions

Results, implementation

- For this, a multi-criteria system for evaluating alternatives for the development of electric network objects, allowing to determine it.
- Decisions of efficiency of the solution are: technical, economic, technical and economic, technical operational, socio-environmental.
- The authors substantiated the architecture of the ANN, a comparative analysis of the algorithms of optimal weighing of weights and their efficiency at different numbers of layers and neurons in them.

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