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## INCREASING OF THE EFFECTIVENESS OF ALGORITHMS IMPLEMENTATION FOR DEVELOPMENT OF DISCRETE MACROMODELS AND THEIR ADAPTATION TO ELECTRIC CIRCUITS SIMULATION PROGRAMS

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### Abstract

*In the paper an improved algorithm for development of discrete macromodels describing technical system components of different nature, including electrical, using the expert analysis, parallel calculations and evolution technique is proposed. The algorithm makes it possible to reduce computational complexity of the macromodels creation essentially. The possibilities of the proposed algorithm adaptation to computer programs for electrical systems simulation which components are discrete macromodels were discussed. References 8, figure 1.*

**Key words:** mathematical macromodel, program software, optimization, algorithm.

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## References

1. Ashlock D. Evolutionary Computation for Modelling and Optimization. New York: Springer, 2006. 578 p.
2. Butenko S., Pardalos P.M., Shylo V. Optimization methods and Application. New York: Springer, 2018. 639 p.
3. Chong E.K.P., Zak S.H. An Introduction to Optimization, 4th Edition, Wiley, 2013. 640 p.
4. Fletcher R. Practical Methods of Optimization, 2<sup>nd</sup> Edition, Wiley, 2000. 456 p. DOI: <https://doi.org/10.1002/9781118723203>
5. Rosolowski E., Stakhiv P., Hoholyuk O. Transformer Discrete Macromodel for Simulation in ATP-EMTP Programme. Proceedings of the *International Conference EPNET"2016* (Electric Power Networks), Szklarska Poreba, Poland, September 19-21, 2016. DOI: <https://doi.org/10.1109/EPNET.2016.7999378>
6. Salinelli E., Tomarelli F. Discrete Dynamical Models. Springer International Publishing, Switzerland 2014. 394 p. DOI: <https://doi.org/10.1007/978-88-470-5504-9>
7. Stakhiv P., Kozak Yu., Hoholyuk O. Discrete macromodeling in electrical engineering and related fields. Monography. Lviv: Publishing House of Lviv Polytechnic National University, 2014. 260 p. (Ukr)
8. Stakhiv P., Byczkowska-Lipinska L., Kozak Yu. The Impact of Calculation Precision on the Process of Mathematical Model Construction with the Use of Optimization. *Przegląd elektrotechniczny* 2013. No 3a. Pp. 283-285.

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