The optimizing transformations formulation of algorithms on graphs and sets

© V.A. Ovchinnikov, G.S. Ivanova

Bauman Moscow State Technical University, Moscow, 105005, Russia

In this work we research of ways of computational complexity reducing of combinatorial optimization algorithms on graphs and sets. In this article the concept of «optimizing transformations of algorithms»is defined. Expediency of their formulation for automatic transformation of algorithms is motivated. The analysis methods to reduce the computational complexity results of characterizing the possibility of formalization are given. The realization stages of the computational complexity reducing of the algorithm method are specified, the structure of optimizing transformations and modification rules of the algorithm are defined. The examples of context-free and context-dependent optimizing transformations formalization in the form of syntactic description of replaceable and substitute fragments and transformation rules are made. The sources and methods of data obtaining to optimizing transformations performance are given, the complexity of their implementation is characterized.

Keywords: *algorithm, computational complexity, graph, set, optimizing transformations, formulation, syntactic description, automatic transformation.*

Ovchinnikov V.A. (b. 1939) graduated from Bauman Moscow Higher Technical School in 1961. Dr. Sci. (Eng.), Professor of the Computer Systems and Networks Department of Bauman Moscow State Technical University, Academician of International Informatization Academy. Author of more then 120 publications in field of computer technique. Specializes in the field of CAD systems. e-mail: vaovchinnikov@gmail.com

Ivanova G.S. (b. 1954) graduated from Bauman Moscow Higher Technical School in 1978, Dr. Sci. (Eng.), Professor of the Computer Systems and Networks Department of Bauman Moscow State Technical University. Author of more then 50 publications in field of computer technique. Specializes in the field of designing complex program systems. e-mail: gsivanova@gmail.com