SHORT COMMUNICATIONS

SEVERAL METHODS OF THE REDUCTION OF COMPUTATIONAL COMPLEXITY

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Abstract. The present communication deals with the effective computer means and fast estimated algorithms of combinatoric problems.

Key words: Computational complexity, combinatorics, fast estimated algorithms, system solvers.

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In computational complexity, the problems can be divided in to two hard and easy solvable problems [1].

If the upper bound of the amount of the computational steps of the algorithm is a polynomial function in n, where n is the number of the input data, the complexity of the algorithm is called polynomial or in the complexity class P [1-3].

If the upper bound is asymptotically exponential, the algorithms considered is called in the complexity class NP. The algorithms in P and NP classes are called easy and hard, respectively.

Many important problems are in NP, and none of the efficient algorithms are known to solve them. Solving them with actual algorithms can be taken up several months of computational time even for very small hard problems [1-4].

In the 20th century, computers were widely used to solve many important NP-complete problems in different domains of industry, science, and computations. Fast solutions of these problems are very significant. The problems are mainly the optimal control of the limited resources in above-mentioned occasions. These are NP complexity problems and their fast solution are not guaranteed [4].

To solve these problems we offer the following:

I. A Principle of Construction of Effective Electronic Systems Solvers for NP-Complete Problems [3].

II. Problem Oriented Systems Solver with Practically Zero Time of Problems Solving - Discrete Electronical Analog Computer of Combinatorial Problems [3,4].

III. Hybrid Problem Oriented Computers for Fast Astimated Solution of NP Complete Problems [5-7].

IV. Simulation of Computations in the above - mentioned Solvers and Fast Astimated Solutions of NP - Complete Problems.

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