ABSTRACT

Master's thesis: 126 p., 33 fig., 26 tab., 1 app., 57 sources.

Relevance. The task of schedule optimizing for partially ordered jobs on machines with different productivity in the presence of idle depending on meaningful values can be found in various areas and interpretations:

☐ allocation of resources in the Grid;

☐ team workflow;

☐ organization of plant;

☐ organization of monthly sales in stores;

☐ material cutting;

☐ chip placing;

☐ allocation of computing tasks (programs) in the cluster.

Relation with academic programs, plans, themes. Master's thesis is performed according to plan of branch of the Department of Computer-Aided Management and Data Processing Systems of the National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute" at the Glushkov Institute of Cybernetics of National Academy of Sciences of Ukraine under the theme "Development of mathematical tool focused on the development of intelligent information technologies for solving problems of combinatorial optimization and information security" (state registration number 0117U000323).

The purpose is increase the efficiency obtained schedules that minimize the time of completion of all jobs.

To achieve this goal, it is necessary to solve the following tasks:

☐ review of the well-known theory, methods and algorithms in the field of the job shop scheduling;

☐ define informative and formal formulation of the job shop scheduling problem;

☐ develop a mathematical model for the job shop scheduling problem;

☐ offer a few approximate algorithms for solving these problems;

☐ develop generator of input data;

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implement the proposed algorithms and generator of input data;

 develop software system to solve these problems that will use the proposed algorithms;

 investigate the effectiveness of implemented algorithms through computational experiment.

Object of the research – the planning of works on different machines.
Subject of the research – algorithms for solving the task of schedule optimizing for partially ordered jobs on machines with different productivity in the presence of idle.
Methods of the research, used in the work, based on the methods of operations research, heuristic, metaheuristic and population algorithms.
Scientific novelty of the research is to develop and use new algorithms for solving the task of schedule optimizing for partially ordered jobs on machines with different productivity in the presence of idle.
Publications. The materials of this work are published in the scientific conference of students, undergraduates and graduate students "Informatics and Computer Science" – IOT-2017, and in the international scientific conference Advanced Information Systems and Technologies — AIST-2017.
SCHEDULING, JOB SHOP SCHEDULING, HEURISTIC ALGORITHMS, METAHEURISTIC ALGORITHMS, GENETIC ALGORITHMS, MEMETIC ALGORITHMS, COMBINATORIAL OPTIMIZATION, MINIMIZING THE TIME OF EXECUTION OF ALL JOBS