# ABSTRACT

Master's thesis: 101 pages, 26 figures, 22 tables, 1 appendix, 55 references.

**Relevance**. Scheduling problems have been widely studying in the literature for 50 years, considerable attention from many scholars and practitioners around the world is given to their consideration. The complex real problems faced by different types of companies have become a challenge to find ways to solve them. The results obtained by researches of various scholars indicate the urgency of the problem and the need for its further research. Thus, one can confidently say that the question of the scheduling problems is one of the most common issues in the field of operations research and management sciences.

The question of scheduling problems covers the studying the complexity of problems, the development of accurate, approximate and heuristic algorithms for their solution. At the same time, most works are devoted to the development of combinatorial approaches. However, as practice shows, the possibilities of combinatorial algorithms are essentially limited by the dimensionality of solvable problems.

In this regard, it is relevant to develop a software product to scheduling tasks by parallel machines, which will help minimize the total deviation from a common due date.

**Relationship of work with scientific programs, plans, themes.** The work was carried out at National Technical University of Ukraine «Igor Sikorsky Kyiv Polytechnic Institute» the department of Computer-Aided Management and Data Processing Systems within the theme "Effective methods for solving the problems of the theory of schedules" (state registration number 0117U000919).

**Purpose and objectives of the study.** Improving the quality of solving problem scheduling tasks at the expense of construction an optimal or close to optimal schedule, which minimizes the average deviation time from due dates.

The following **tasks**:

- performing the known scheduling results analytical review;
- developing an algorithm for minimizing the total deviation for common due date by parallel machine scheduling;
- developing a software implementation of the algorithm in a form that can be used for schedule optimizing;
- performing an analysis of the results.

**The object of study** is operational planning of small-scale production.

**Subject of research**: models and methods for solving scheduling problems in order to minimize the total deviation of completion times from a common due date by parallel machines.

**Scientific novelty of the research.** A heuristic algorithm for solving the problem of minimizing the total deviation from the common policy term when performing tasks with parallel devices is developed.

**Publications.** Materials of the work are published in the International Scientific Journal "Scientific Review" - № 9 (14). - p. 14-32 in 2017 [1], materials are also published in the theses of the 20th International Scientific and Technical Conference SAIT 2018 [2] and in the scientific conference of students, graduate students and postgraduates "Informatics and Computing" 2018 [3].


SCHEDULE, DUE DATE, RELEASE DATE, PARALLEL MACHINES, IDENTICAL MACHINES, PROPORTIONAL MACHINES, TARDINESS, EARLINESS, MINIMIZING TOTAL DEVIATION