ABSTRACT

The size of the explanatory note is 163 pages, contains 7 illustrations, 18 tables, 5 applications, 48 references.

Topicality. Decision-making in the context of a conflict of interest is an urgent and fundamental problem of the general theory of decision-making, both in theory and practice, due to the extremely common situation when a decision that satisfies one decision-maker may be completely unacceptable from the point of view of another decision-maker. In theoretical terms, the solution to this problem is to find such compromise criteria and appropriate algorithms for finding compromise solutions that meet these criteria, which have wide practical application.

The aim of study. The main objective of the study is to improve the efficiency of decision-making in multi-objective linear programming problems by creating original software that implements new models and algorithms.

Object of research: decision-making process in multi-objective decision-making problems.

The subject of research**:** mathematical and software for decision-making in multi-objective linear programming problems in a deterministic formulation and under conditions of uncertainty.

To achieve this goal, **the following tasks** were formulated:

- Critical analysis of trade-off criteria and algorithms for finding appropriate solutions to a multi-objective linear programming problem in a deterministic formulation;

- Critical analysis of software tools that solve the problem of decision-making in conditions of conflict of interest;

- development of original algorithms for finding compromise solutions under conditions of uncertainty;

- creation of an original linear aggregated volume-time model for one class of discrete production systems;

- creation of the architecture of a cross-platform library that implements a compromise solution for a given set of compromise criteria;

- solving four problems based on the created cross-platform library that implement a linear aggregated volume-time model with scalar and vector criteria in a deterministic formulation and under uncertainty.

The scientific novelty of the results of the master's dissertation is that for the first time, new software has been created using new algorithms for constructing trade-off solutions for multi-objective linear programming problems and their implementation for the original linear aggregate volume-time model for one class of discrete production systems.

The practical value of the obtained results is that the developed software, based on reasonably selected trade-off criteria and algorithms, significantly increases the efficiency of the decision-making process in conditions of conflict of interest based on multi-objective linear models.

Relationship with scientific programs, plans, topics. The work was carried out at the Department of Informatics and Software Engineering of the National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute".

Approbation. The scientific provisions of the dissertation were tested at the non-accessible conference Pavlov O.A., Palekha B.P. Algorithms of Multiobjective Linear Programming under Uncertainty. The VI International Scientific and Practical Conference of Young Scientists and Students "Algorithms of Multi-objective Linear Programming under Uncertainty (SoftTech-2023)" is dedicated to the 125th anniversary of Igor Sikorsky Kyiv Polytechnic Institute. Section of the Department of Informatics and Software Engineering. Kyiv, 19-21 December 2023.

Publications. The scientific provisions of the dissertation are published in:

Pavlov O.A., Palekha B.P. Algorithms of Multi-objective linear programming under uncertainty. VI International Scientific and Practical Conference of Young Scientists and Students "Algorithms of Multi-objective Linear Programming under Uncertainty (SoftTech-2023)" dedicated to the 125th anniversary of Igor Sikorsky Kyiv Polytechnic Institute. Section of the Department of Informatics and Software Engineering. Kyiv, 19-21 December 2023.

Pavlov O.A., Kiselev M.E., Palekha B.P. Aggregated volume-time planning models for one class of discrete production systems // Interdepartmental scientific and technical journal // Adaptive automatic control systems: interdepartmental scientific and technical collection. K.: NTUU "KPI", 2024. T. 2. № 45. P. XXX-XXX. https://doi.org/10.20535/1560-8956.45.2024.XXXXXX,

Keywords: MULTIOBJECTIVE LINEAR PROGRAMMING, TRADE-OFF CRITERION, TRADE-OFF DECISION, LINEAR AGGREGATE VOLUME-TIME MODEL OF PRODUCTION, SOFTWARE ARCHITECTURE, CROSS-PLATFORM LIBRARY.