



SJR: 0.232
SNIP: 0.464
CiteScore™: 0.27

ISSN Print: **1064-2315**
 ISSN Online: **2163-9337**

[Buy Now](#)
Volumes:
 Volume 51, 2019

- [▶ Issue 1](#)
- [▶ Issue 2](#)
- [▶ Issue 3](#)
- [▶ Issue 4](#)
- [▶ Issue 5](#)
- [▶ Issue 6](#)
- [▶ Issue 7](#)
- [▶ Issue 8](#)
- [▶ Issue 9](#)
- [▶ Issue 10](#)
- [▶ Issue 11](#)
- [▶ Issue 12](#)

- [Volume 50, 2018](#)
- [Volume 49, 2017](#)
- [Volume 48, 2016](#)
- [Volume 47, 2015](#)
- [Volume 46, 2014](#)
- [Volume 45, 2013](#)
- [Volume 44, 2012](#)
- [Volume 43, 2011](#)
- [Volume 42, 2010](#)
- [Volume 41, 2009](#)
- [Volume 40, 2008](#)
- [Volume 39, 2007](#)
- [Volume 38, 2006](#)
- [Volume 37, 2005](#)
- [Volume 36, 2004](#)
- [Volume 35, 2003](#)
- [Volume 34, 2002](#)
- [Volume 33, 2001](#)
- [Volume 32, 2000](#)
- [Volume 31, 1999](#)
- [Volume 30, 1998](#)
- [Volume 29, 1997](#)
- [Volume 28, 1996](#)

Journal of Automation and Information Sciences

DOI: 10.1615/JAutomatInfScien.v51.i9.60
pages 66-76

Technology to Improve the Safety of Choosing Alternatives by Groups of Goals

Vladimir V. Polishchuk
Uzhgorod National University, Uzhgorod

ABSTRACT

Recent scientific studies indicate the need to evaluate the alternatives for incomplete or fuzzy conditions where there are a lot of goals, each of which has its own set of criteria groups. Examples of such tasks are the assessing banking institutions to obtain a loan, making deposit funds or servicing; assessment of crowd-funding platforms by startups to obtain capital or by investors to finance their projects and many others. The research of the actual task of developing models for technology of increasing the safety of choosing alternative variants by the groups of goals was conducted. This technology builds a ranked series of alternatives relative to groups of goals and groups of criteria for goals, increases the safety of choosing alternatives and the objectivity of evaluating. This study uses the matrix multiplication method in the form of 7 step algorithm which allows one to operate with matrices of large dimensions, independently assesses the importance of criteria as to alternatives, reducing the experts subjectivity, does not require pairwise comparisons of alternatives and a lot of calculations. The concept of a "satisfaction vector" is introduced (an imaginary alternative in which estimates of coordinates by goals could satisfy a decision maker). A model for solving the problem of multi criteria choice of alternatives is proposed using the "satisfaction vector" which allows us to build a ranked series of alternatives represented by the evaluation vector. The final result is a general aggregate estimate of alternatives and their ranked series. An example of constructing a "satisfaction vector" for the task of choosing a bank institution by a business entity when obtaining loan funds or making deposit resources is described. The developed technology will be a useful tool to justify and increase the safety of choosing an alternative by a decision maker.

KEY WORDS: multi criteria choice of alternatives, ranked series of alternatives, "satisfaction factor", decision making, safety of choosing an alternative

 REFERENCES

1. Keeney R., Raiffa K., Decision-making in many criteria: preferences and substitutions [Russian translation], Radio i svyaz', Moscow, 1981 .
2. Saati X., Making decisions Method of hierarchy analysis [Russian translation], Radio i svyaz', Moscow, 1993 .
3. Zadeh L., The concept of linguistic variable and its application to approximate reasoning [Russian translation], Mir, Moscow, 1976 .
4. Roy B., Multicriteria methodology for decision aiding, Kluwer Academic Publisher, Dordrecht, 1996 .
5. Larichev O. X., Verbal decision analysis [in Russian], RAN, Institut sistemnogo analiza, Nauka, Moscow, 2006 .
6. Malyar M.M. Models and methods of multi criteria limited rational choice [in Ukrainian], RA "AUTDOR-SHARK", Uzhgorod, 2016 .
7. Kofman A., Hill A., Aluha K., Introduction of fuzzy sets theory in enterprise management [Russian translation], Vysshaya shkola, Moscow, 1992 .
8. Zaichenko Yu. P., Fuzzy models and methods in intellectual systems [in Russian], Slovo, Kiev, 2008 .
9. Zgurovsky M., Pankratova N.D. Foundations of systems analysis [in Ukrainian], Vydavnycha grupa BHV, Kyiv, 2007 .
10. Pankratova N. D. Nedashkivska N. X., Models and methods of hierarchies analysis: Theory Application [in Ukrainian], Politekhnik, Kyiv, 2010 .
11. Pankratova N., Nedashkovskaya N., The method of estimating the consistency of paired comparisons, International Journal "Information Technologies and Knowledge", 2013, 7, No. 4, 347-361. .
12. Totsenko V.G., Methods and systems of decision making support. Algorithmic aspect [in Russian], Naukova dumka, Kiev, 2002. .
13. Polishchuk V.V., Algorithm for ranking of multi criteria alternatives, Zbirnyk naukovykh prats' Instytutu problem modelyuvannya v enerhytytsi im. G.E.Pukhova NAN Ukrainy, 2013, No. 68, 100-105. .
14. Polishchuk V.V., Fuzzy method for evaluating commercial projects of different origin, Mezhdunarodnyi nauchno-tekhnicheskii zhurnal "Problemy upravleniya i informatiki", 2018, No. 3, 59-71. .
15. Kelemen M., Polishchuk V., Information model of evaluation and output rating of start-up projects development teams, Proceedings of the Second International Workshop on CMIS, Zaporizhzhia, Ukraine, 2019. CEUR Workshop Proceedings, 2353, 674-688, <http://ceur-ws.org/Vol-2353/paper54.pdf> .
16. Malyar M.M., Polishchuk V.V., Sharkadi M.M., Model of information technology for assessment of projects financing risk, Radioelektronika, informatyka, upravlinnya, ZNTU, Zaporizhzhia, 2017, No. 2, 44-52, DOI: <https://doi.org/10.15588/1607-3274-2017-2-5> .
17. Malyar M.M., Polishchuk V.V., Polishchuk A.V., Information model of assessment of bank institutions, Naukovyi visnyk Uzhgorodskogo Universytetu. Seriya "Ekonomika", 2019, 53, No. 1, 168-172, DOI: [https://doi.org/10.24144/2409-6857.2019.1\(53\).168-172](https://doi.org/10.24144/2409-6857.2019.1(53).168-172) .

[▶ Purchase \\$40.00](#)
[▶ Check subscription](#)
[▶ Download MARC record](#)
[▶ Add to Citation Manager](#)