Table of contents

P. Vitynskyi, R. Tkachenko, I. Izonin. Ensemble-based method for fraud detection	
at self-checkouts in retail	3
V. Pasichnyk, T. Shestakevych, N. Kunanets, A. Rzheuskyi, V. Andrunyk. Accessibility	
Analysis of Scientific Libraries Web Resources	9
V. Verhun Identification and Analysis of Learning Styles of MOOC Students	17
S. Bilokon, Y. Turbal, N. Kunanets, V. Pasichnyk. Modern Methods of Irrigation Water	
Purification by a Mesh-Filter Using Influence of Low Frequency Vibration	21
V. Snytyuk, O. Brovarets. Information Technology of Optimized Agro-biological	
State Management of Agricultural Lands	27
D. Zerbino. Improving Image Sharpness by Surface Recognition	39
M. Verkhola, U. Panovuk, I. Huk. Modeling and Analysis of Ink Distribution	
in the Ink Printing System of the Sequential-Parallel Structure	45
V. Shliakhov, G. Chetverykov, I. Bozhko, N. Shliakhova. Predicate Data Model	
in the Form of a Linear Space	51
Ye. Levus, O. Sivets. The Application of Quest Technologies in Teaching Students	
of IT Specialties	55
S. Chernov, S. Titov, L. Chernova, N. Kunanets, L. Chernova. Determination of Approaches	
for Project Costs Minimization with Use of Dual Problems	61
T. Pytlenko, N. Kunanets, N. Mumchur. The project of the intellectual information	
system for student knowledge testing	69

Editors of the "ECONTECHMOD" magazine of the Commission of Motorization and Energetics in Agriculture would like to inform both the authors and readers that an agreement was signed with the Interdisciplinary Centre for Mathematical and Computational Modelling at the Warsaw University referred to as "ICM". Therefore, ICM is the owner and operator of the IT system needed to conduct and support a digital scientific library accessible to users via the Internet called the "ICM Internet Platform", which ensures the safety of development, storage and retrieval of published materials provided to users. ICM is obliged to put all the articles printed in the "ECONTECHMOD" on the ICM Internet Platform. ICM develops metadata, which are then indexed in the "BazTech" database.

We are pleased to announce that the magazine "ECONTECHMOD" (ISSN 2084-5715) has undergone a positive evaluation of the IC Journals Master List 2016, the result of which is granting the ICV Index (Index Copernicus Value) 76.77 pts. The resulting score was calculated on the basis of a survey submitted by the Editorial Team as well as assessments made by the professionals from Index Copernicus. We invite you to familiarize yourself with the methodology of IC Journals Master List evaluation:

http://journals.indexcopernicus.com/masterlist.php?q=econtechmod

Impact factor of the "ECONTECHMOD" quarterly journal according to the Commission of Motorization and Energetics in Agriculture is 1,53 (December 2017).

Guidelines for Authors

ECONTECHMOD is an international journal that publishes, in English, original research papers containing new and significant information on economics, new technologies and modeling in the field of:

- production engineering, energy technology and environment (industry 4.0),
- applied information technologies (among others: geo-information systems, cyber-physical systems, internet of things, artificial intelligence),
- land transport (logistics).

All contributions must be based on original research and contain novel findings, which have not been previously published in any other scientific journals (except as abstracts, theses, short reports). The contributions must present recent research data adequately statistically validated and followed by a comprehensive discussion of factors affecting results. Results reported in manuscripts must be based on repeated trials or experiments.

Upon submission of the manuscript to the Editorial Office, the author(s) guarantee(s) that the material and the major scientific conclusions have not been previously published, and that the content of the manuscript and authorship have been agreed with the co-authors. Manuscripts may be rejected without peer-review by the editor-in-chief if they do not meet the instructions to authors, or do not fall within the scope of the journal.

A manuscript prepared following the directions given in this text has to be submitted online to the Editorial Office at: econtechmod@wsie.edu.pl

After a positive initial evaluation, submissions are anonymously single blind peer-reviewed by at least two reviewers. The Editorial Board make the final decision to accept or reject the manuscript for publication.

Manuscript preparation

Manuscripts should be written in British English in simple declarative sentences. Authors should consult papers in recent issue of this journal for details of manuscript style and formatting that are not given below. Manuscripts should not exceed 12 pages, including tables and figures. Tables and figures should be included in the text. Manuscripts should be typed using Microsoft Office Word text editor Times New Roman (TNR), font 12. Format A4 (210 x 297 mm), spacing – 1.5, alignment – justify.

Structure and scope

The text of the manuscript and its constituent parts should be arranged as follows: title section, Abstract, Key words, Introduction, Materials and methods, Results and discussion, Conclusion(s), Acknowledgements (optional) and References.

Title section: should contain informative title of the manuscript, first name and surname of the authors, the name of institution, its address, corresponding author's e-mail address.

Abstract: should state the purpose of the research, the main methods and results and should not exceed 300 words. It should not contain references.

Key words: maximum 6 words, in alphabetical order, separated by comas. Words from the title should not be used.

Introduction: background and significance of the problem by using the most recent publications should be provided. The aim of the study should be clearly stated at the end of introduction.

Materials and methods: authors should provide a concise description of experimental site, design, materials and analytical methods and statistical procedures used. This part should be as clear as possible to enable other scientists to repeat the research presented.

Results: this section can be divided into subsections. The numbers from the tables or figures should not be repeated extensively in the text and long explanations of the tables and figures are not acceptable. The same information given in the table should not be repeated in the figure or vice versa. Relevant statistical information should be provided in tables and figures. Statistical significance should be clearly indicated where applicable.

Discussion: interpretation of data, related to previous research, should be presented. Results and discussion

sections may be combined.

Conclusion(s): main significant results of the study should be presented in a clear and concise way and should be numbered.

Acknowledgements (optional): acknowledgements of funds, grants, etc. may be placed.

References: the number of references should not exceed 40 (except for review articles). The list should include more recent items – peer-reviewed scientific articles, scientific books and monographs and other scientific publications, except for textbooks, manuals or training materials. References to abstracts or proceedings are acceptable only in exceptional cases.

All publications cited in the text should be presented in a list of references. In the text, references should be cited by author and year of publication, for example: Andruszczak (2017), Karklins, Ruza (2015). If reference is made in the text to a publication written by more than two authors the name of the first author should be used followed by "et al." (Staugaitis *et al.* 2016). References cited together in the text should be arranged chronologically.

The list of references should be arranged alphabetically by authors' names, and chronologically per author. Publications by the same author(s) in the same year should be listed as 2017 a, 2017 b, etc. All authors of each publication should be included into the reference list. Titles of scientific journals, conference proceedings etc. should not be abbreviated.

Priority should be given to references in English. In the case of articles in any other language, the original title is to be translated into English and the original language should be indicated in parenthesis, e.g., (in Polish), (in Russian), (in German), (in French), etc.

Examples of references

For journals:

Djeridane A., Yousfi M., Nadjemi B., Boutassouna D., Stocker P., Vidal N. 2006. Antioxidant activity of some Algerian medicinal plants extracts containing phenolic compounds. Food Chemistry, 97: 654-660.

Lunt I.D., Spooner P.G. 2005. Using historical ecology to understand patterns of biodiversity in fragmented agricultural landscapes. Journal of Biogeography, 32: 1859–1873.

For books:

Inovative solutions of soil and agrochemistry science. 2015 / compiled by Staugaitis G., Vaišvila Z. Lithuanian Research Centre for Agriculture and Forestry, 320 p. (in Lithuanian).

For book chapters:

Staszewski Z., Staszewska U. 1994. Thuringian Mallow (*Lavatera Thuringiaca* L.) - an Alternative Crop for Marginal Conditions and Wasted Lands. In: Rognli O.A., Solberg E., Schjelderup I. (ed.) Breeding Fodder Crops for Marginal Conditions. Developments in Plant Breeding, vol 2. Springer, Dordrecht

For proceedings:

Backiel T., Penczak T. 1989. The fish and fisheries in the Vistula River and its tributary, the Pilica River. In: Proceedings of the International Large River Symposium (ed. D.P. Dodge). Canadian Special Publication of Fisheries and Aquatic Sciences 106. Ottawa, Canada: 488-503.

Kheyrodin H., Antoun H. 2008. Tillage manure effect on soil microbial biomass and respiration and on enzyme activities. 5th International Symposium ISMOM 2008. Pucón, Chile, Session 4: 16.

For on-line documents:

U.S. Environmental Protection Agency. 2010. Motor Vehicle Emissions Simulator (MOVES). User Guide for MOVES2010a, Assessment and Standards Division, Office of Transportation and Air Quality, U.S. Environmental Protection Agency. EPA-420-B-10–036. Washington, DC August 2010.

For thesis or dissertation:

Rymarz, M. 2015. Modelling of environmental quality in the language of Bayesian networks. Ph.D. thesis (in Polish). University of Life Sciences, Faculty of Production Engineering, Lublin, Poland p 99.

Units

Units of measurements should be given in the SI system (Système International dí Unités), for example kg ha⁻¹; mol dm⁻³; g kg⁻¹; mg kg⁻¹ (elemental forms should be used).

Nomenclature

Latin names of plant species, genus, pests, micro-organisms also causal agents of diseases should be written with taxon name, in Italic, e.g., *Cucumis sativus* L., *Blumeria graminis* DC. Speer. The terms and names of plants, biology, entomology, phytopathology, pesticides, agrochemistry and soil must meet the most recent requirements of their international nomenclature, names and spelling.

Tables and figures

The size of tables and figures must not exceed the B5 format (125 mm x 195 mm); descriptions of tables with TNR font 10, completion of tables font 10, single space. Large tables should be avoided. If many data are to be presented, an attempt should be made to divide them over two or more tables. The preferred format for tables is MS Word. Tables should be numbered according to their sequence in the text in Bold, e.g., **Table 1**. Each table should have a brief and self-explanatory title. Column headings should be brief, but sufficiently explanatory. Any explanation essential to the understanding of the table should be given as a footnote at the bottom of the table. The columns and rows in the tables should not be separated either by horizontal or vertical lines. Only horizontal lines should be used to separate column headings and the end of the table.

All illustrative material – drawings, graphs, diagrams, photos, pictures, etc. are called by a common name of figures, e.g., **Figure 1**. Figures are published only in black and white. Coloured photos will be represented only in the online version and black and white ones in the paper version. To maintain clear contrast, use line patterns instead of shading and avoid thin, light lines. Graphs should be done using Microsoft Office Excel and provided under the text of the manuscript and by a separate Excel file. If figures are produced not in Excel, they should be in separate graphic .jpg or .tiff format files (in a resolution of at least 300 dpi). Times New Roman, font size 12 should be used in figures (there should be no Bold, no frames around pictures). Figure legends should be concise and should give enough information to make the figure understandable. All symbols reported in the figure must be defined and all abbreviations should be explained.

Statistical data

The data provided in the tables and figures should be statistically processed.

Linguistic consultant: Natalya Shakhovska

Typeset: Tetiana Shestakevych

All the articles are available on the webpage: http://econtechmod.pl/

All the scientific articles received positive evaluations by independent reviewers

ISSN 2084-5715

Editorial

© Copyright by University of Engineering and Economics in Rzeszów 2019 © Copyright by Lviv Polytechnic National University 2019

Editorial Office Address

University of Engineering and Economics in Rzeszow Miłocińska 40, 35-232 Rzeszów, Poland e-mail: econtechmod@wsie.edu.pl

Edition 200+16 vol.

Lviv Polytechnic National University Institutional Repository http://ena.lp.edu.ua