Opinion

of Prof. Dr. Maria Nisheva – FMI, Sofia University St. Kliment Ohridski

on Doctoral Thesis in Professional Area 4.6 Informatics and Computer Science

Thesis Title: "Personality and decision-making models in Internet"

Professional Area: 4.6 Informatics and Computer Science

Author: Rumen Rumenov Ketipov

Doctoral Thesis: Content, Results and Contributions

The doctoral thesis of Rumen Ketipov is devoted to research in the field of modeling user behavior. Its main goal is to create behavioral models for predicting user preferences in decision-making in the area of e-commerce.

The dissertation consists of 259 pages of text, including a list of abbreviations and notations used, a list of tables, a list of figures, an introduction, three chapters, conclusion, declaration of originality of the results, a list of references and two appendices.

The introduction presents in brief the field of research, discusses the relevance and significance of the topic and formulates the purpose and objectives of the dissertation.

The first chapter is devoted to an analysis of the state of research in the interdisciplinary field chosen by the author. The possibilities for application of machine learning methods in predicting consumer behavior in an online environment are discussed.

In the second chapter the methodology of organization and conducting of the planned empirical research proposed by the author is presented.

In the third chapter the results of the practical experiments conducted by the author on the topic of the dissertation and the corresponding software tools created for this purpose are discussed.

In the conclusion, a summary of the results of the author's research on the topic of his doctoral thesis is made and some opportunities for their further development are presented.

The dissertation has mainly ***applied scientific contributions***, which can be summarized as follows:

- A set of basic functionalities of e-shops have been formulated and a categorization of these functionalities has been proposed;
- Models of consumer behavior in decision-making in e-commerce are proposed, which can find real practical application;

- An optimized version of the widely used in practice random forest method for machine learning has been implemented.

The results achieved by the author are original and fully correspond to the declared goals of the doctoral thesis.

Publications on the Doctoral Thesis. Reflection on the Works of Other Authors

The author has worked on nine papers related to parts of his doctoral thesis. From them:

- three publications are in scientific journals with SJR for the year of publication;
- one publication is in a volume, referenced and indexed in the ACM Digital Library;
- four publications are in unreferred books of proceedings of international scientific forums held in Bulgaria;
- one publication is in a book of proceedings of an annual scientific conference of a higher school in the country.

Therefore, the minimum national requirements and the additional requirements under Art. 1a, para. 2 of the Regulations for the implementation of the Act on Development of the Academic Staff in the Republic of Bulgaria for acquiring the educational and scientific degree "Doctor" in professional area 4.6 Informatics and Computer Science are fully covered and exceeded by the candidate.

All publications on the doctoral thesis are co-authored. I take into account the fact that serious studies in the chosen interdisciplinary area are, as a rule, a collective work, and I have no doubt about the personal contribution of Rumen Ketipov in the publications related to his thesis, but I recommend him to aspire also to some single-authored publications in his future work.

Information about three citations of publications on parts of the doctoral thesis of Rumen Ketipov is provided by the author.

Critical Remarks and Recommendations

In general, the presentation of the doctoral thesis is too narrative and insufficiently analytical. There is no substantial argumentation for the choice of machine learning methods. The contributions of the dissertation are not explicitly formulated. I recommend the author to adhere to the use of the established terms in Bulgarian and in particular to use the correct term "машинно самообучение" instead of "машинно обучение".

Abstract

The abstract corresponds to the content and the contributions of the dissertation, but its volume is too large and at the same time the presentation of some parts of it is too superficial.

Summary

Summing up, I consider that the doctoral thesis of Rumen Ketipov satisfies the requirements of the national regulations and the specific conditions and requirements of the Institute of Information and Communication Technologies at the Bulgarian Academy of Sciences. Its author has achieved original research results that can find real practical application. Therefore, **I give a positive assessment of the doctoral thesis and advise the honorable scientific jury to award to Rumen Rumenov Ketipov the educational and scientific degree "Doctor" in professional area 4.6 Informatics and Computer Science.**

Sofia, June 22, 2021

Prof. Dr. Maria Nisheva