



2018-08-10

To

The Dean of Department of Informatics

The Pomeranian University, ul. Żołnierska 49, Szczecin, Poland

Review of the Doctoral Thesis titled “Metoda identyfikacji wielokryterialnego eksperckiego modelu decyzyjnego z zastosowaniem teorii zbiorów rozmytych” (in Polish) by Wojciech Sałabun

Dear Dr. Pejas,

It is my genuine pleasure to provide assessment for **the doctoral student Mr. Wojciech Sałabun** concerning his application for promotion to the doctor’s degree at the Pomeranian University.

I have found Mr. **Wojciech Sałabun** to be a very well-established and independent researcher with a very good and astonishingly large publication record, well-defined research areas, and a truly comprehensive and highly diversified teaching portfolio. The number of his publications confirms his engagement and skills, which exceeds average requirements to reach the doctor’s degree. The quantities of citations of his works are very high. Mr. **Sałabun** is also a visible and active member of many international conferences, where he reveals professional knowledge concerning his research domains of Artificial Intelligence. The prizes, obtained from the vice-chancellor of the Pomeranian University, only confirm his enormous capacity, unusual for so young age. Apart from an enormous engagement into his research, he is also socially involved in the students’ organizations.

In the thesis, the model of characteristic methods (COMET) is discussed and compared with contra dictionary algorithms of multicriteria decision making.

The author proves that the presented method possesses the unique properties, which are rare in the field of multicriteria decision making. The procedure is resistant for the rank reversal paradox. COMET evaluates alternatives-decisions, basing on characteristic objects, independent of a set of decision variants. The elements of fuzzy set theory, inserted as fuzzy numbers in the COMET algorithm tested, allow correcting the accuracy of results, when comparing to other multicriteria decision making tools like TOPSIS or AHP.

To provide a reader with the description of his new contributions, the doctoral student has prepared the introduction in Polish, which constitutes a very understandable and concise version of his aspect of decision making. Some practical medical examples make the process

of going through the procedure very easy. In this section, the advantages and disadvantages of COMET are honestly clarified. We can even trace some proposals of future works.

Afterwards, he has cited 10 chosen papers, in which, step by step, he builds the methodology of his algorithm. The papers are placed in a good logical continuation order.

The papers, submitted as a part of the application package, are of a very good quality. They present some useful ideas of substantial practical relevance as well as elaborate on some interesting methodological aspects of the theory of fuzzy and multi-criteria decision making. Apart from that, the contribution of own ideas into enclosed publications is very large and novel.

It is also relevant to emphasize that the applicant has successfully connected several areas of research like group decision making, linguistic variables, representation of term-sets of linguistic variables by fuzzy numbers, methods of distances, characteristic object method and many others. The applicant's contributions are well documented through a series of publications in outstanding journals, and well-indexed conference proceedings. Since the papers already were peer-reviewed by experienced scientists, I should not add some extra comments to their contents.

The languages, both Polish and English are used correctly without spelling errors. The graphs are made thoroughly and legibly.

Let me stress that the overall documentation in the doctor's dissertation has been prepared very carefully with substantial attention to all pertinent details.

Thus, in my opinion the novel and independent research and teaching, leadership and organizational accomplishments make Mr. **Wojciech Sałabun** a very suitable candidate for the promotion to the rank of the doctor's title. I truly support his application.

After getting to know the requirements, obligatory for doctoral dissertations due to position 13 of rule 1 of the current Act of the Polish law from March 14, 2003 on academic degrees and academic titles in the field of art (with later changes), I ascertain that the reviewed work meets and clearly exceeds these requirements. Therefore, I strongly recommend its admission to a public defence.

I also ask for awarding the PhD candidate with honourable mention.

Should you require any additional information, do not hesitate to contact me.

With best regards, sincerely yours

Elisabeth Rakus-Andersson

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