

OPINION

in connection with the competition for the academic position "Professor" for the needs of the section "Bioinformatics and Mathematical Modeling" at IBFBME - BAS - field of higher education "4. Natural Sciences, Mathematics and Informatics", professional field "4.6. Informatics and Computer Science", scientific specialty "Informatics" (announced in SG No. №98 / 17.11.2020), with a sole candidate Assoc. Prof. Dr. Eng. Olimpia Roeva

1. Brief biographical data

Assoc. Prof. Dr. Eng. Olimpia Roeva was born on February 16, 1974. In 1998 she graduated from the Technical University - Sofia, majoring in "Bioelectric Engineering". In the period 2001–2004 she was a doctoral student at the Bulgarian Academy of Sciences, Central Laboratory of Biomedical Engineering (CLBME) and in 2007 she defended her doctoral thesis on "Modeling of functional states in the cultivation of Escherichia Coli using genetic algorithms." Her professional career began at the Institute of Microbiology-BAS, as a specialist in the period 1998-2001 and continued at CLBME (since 2010 Institute of Biophysics and Biomedical Engineering - IBFBME). In the period 2001 - 2004 she was a doctoral student, after she has been a research associate from 2004 to 2009 and from 2009 until now - Associate Professor in specialty 02.21.12 "Bioautomatics" in the section "Bioinformatics and Mathematical Modeling" at IBFBME - BAS. Her research interests are in the fields of modeling, optimization and management of bioprocesses, approaches for modeling of functional states, optimization approaches and algorithms, metaheuristic algorithms, apparatus of generalized networks, optimal management.

2. Scientific publications and research projects. Awards. Expert activity. Teaching activity.

The candidate Assoc. Prof. Roeva presented her publications in this competition in three sections, the first of which covers articles published in journals with IF - 15 in number, the second - articles in journals with SJR - 12 in number, the third - chapters from books referred in Scopus - 2 in number. The total number of publications is 29 (4 are individual, and the remaining 25 are collective works, in 20 of which she is the first author) and I accept all of them for review. I do not question the significant personal contribution of the candidate. Additionally, there is given a list of reports at international and national conferences, published in full text - 43 in international and 6 in national, but with these publications Assoc. Prof. Roeva does not participate in the competition. I also take into account the general list of all scientific publications so far (223) only as a general characteristic of her research work. Starting from 1999 until now, the publishing activity of Assoc. Prof. Roeva has been evenly distributed over the years, i.e. there are no years of "publication lull". Commenting on this indicator, I also consider her publications outside those of the competition. The most active years are from 2010 until now.

The publications in the competition have been cited 136 times (according to Scopus), and her publications (all, not only those in this competition) have been cited a total of 402 times, according to Scopus, h-index-11; 189 times, according to Web of Science, h-index-9; 1527 times, according to Google Scholar, h-index-20.

In the last 10 years, after the habilitation, Assoc. Prof. Roeva has participated in 10 research projects, of which: 2 projects under FP7 of the EU; 6 projects funded by NFSR (in 1 project she is project leader); 1 international, funded by DFG, Germany, 1 international EERP project (with Poland).

She has received 5 prestigious awards in Bulgaria. Assoc. Prof. Roeva has reviewed over 100 articles for international and Bulgarian journals and has participated in a number of scientific juries, program and

organizational committees of international and national scientific forums. She is a member of the editorial boards of two scientific journals. She has led exercises in two disciplines and she has led a successfully defended doctoral student.

3. Main scientific, scientific-applied and applied contributions related to the publications with which she participates in the competition for "professor"

The candidate's research is generally in the field of artificial intelligence methods for mathematical modeling, control and process optimization. She has a number of scientific, scientific-applied and applied contributions in the following subfields: metaheuristic algorithms and techniques; hybrid algorithms between metaheuristic techniques and between metaheuristic and some classical optimization methods; application of intercriteria analysis in parametric identification; application of the apparatus of generalized networks. As the most significant, generalized contributions I would highlight:

- Five hybrid metaheuristic algorithms have been developed and implemented, which improve the accuracy of solutions and reduce computational resources in the parametric identification of nonlinear models.
- Different (seven in number) metaheuristic algorithms have been adapted and applied in parametric identification of nonlinear models of *E. coli* fermentation processes.
- The proposed algorithms and techniques are programmatically implemented in MATLAB environment.

4. Critical remarks and recommendations

I would like to make a general remark to Assoc. Prof. Roeva for insufficient activity regarding the management of doctoral students and graduates. Her possibilities in this direction are greater and so far still not fully used.

5. Personal impressions of the candidate

I have known Assoc. Prof. Roeva for more than 15 years. During this period I have repeatedly had the opportunity to be convinced of her ability to generate new ideas and implement them, as well as her high professionalism in the field in which she works.

6. Conclusion

From the works on the competition for professor in the scientific specialty "Informatics", announced for the needs of the section "Bioinformatics and Mathematical Modeling" at IBFBME - BAS, it can be seen that Assoc. Prof. Dr. Olimpia Roeva is an in-depth and established researcher who has a number of scientific, scientific-applied and applied contributions. Due to all the above, I strongly suggest to the respected members of the Scientific Jury to vote for the election of Assoc. Prof. Dr. Olimpia Roeva as "Professor".

Sofia, February 22, 2021

JURY MEMBER:

(Corr.-member Prof. Stefan Hadjitodorov)