OPPINION

by Roumen Zlanev Iankov, Professor at the Institute of Mechanics - BAS

of materials submitted for participation in the competition

for holding the academic position of "Professor" at IICT-BAS

in a professional field 4.5. Mathematics, scientific specialty "Computational Mathematics"

By order № 132 of 13.05.2022. of the Director of IICT-BAS I have been confirmed as a member of the scientific jury in a competition for professor, announced in SG No. 21 of 15.03.2022. Documents for participation in the competition were submitted by Assoc. Prof. Dr. Stanislav Nikolaev Harizanov from IICT-BAS, section "Scientific calculations with a laboratory for 3D digitalization and microstructural analysis"

1. Brief biographical data

Prof. Stanislav Harizanov graduated from FMI of SU "St. Kliment Ohridski" with OCS "Bachelor" in 2005. He continued his education at Jacobs University Bremen (Germany) where in 2008 he graduated as "Master of Mathematics", and later in 2011 at the same university he defended his dissertation for awarding the scientific and educational degree "Doctor of Mathematics". From 2011 to 2013, he was a post-doctoral fellow at the University of Kaiserslautern & Fraunhofer ITWM, Kaiserslautern (Germany). In the period from 2014 to 2018, he successively held the position of "assistant" in the "Scientific Calculations" section of IIKT-BAS and the "Mathematical Modeling and Numerical Analysis" section of IMI-BAS and "chief assistant" in the same scientific units. In 2018, he was elected as an associate professor at IIKT-BAS, section "Scientific calculations with a laboratory for 3D digitization and microstructural analysis".

2. General description of the presented materials

The materials presented by Assoc. Prof. Stanislav Harizanov have been prepared in accordance with the Development of Academic Staff in Bulgaria Act (DASRBA), as well as with the specific requirements of the regulations of BAS and IICT-BAS. The following materials for participation in the competition are presented: CV; a copy of the diploma for educational and scientific degree "Doctor"; certificate of internship in the specialty; list of scientific publications for participation in the competition; list of citations; summaries of scientific publications; copies of scientific publications for participation in the competition;

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reference to the minimum requirements of IICT; reference to the original scientific and applied scientific contributions; a declaration that there is no legally proven plagiarism in scientific works; electronic carrier of the competition materials.

For participation in the competition Assoc. Prof. Stanislav Harizanov has presented 15 scientific publications covering the period 2019-2022. 13 of them have been published, 2 have been accepted for publication. 1 chapter of a book and 1 textbook are presented. All publications are in English and are from the period after the acquisition of the academic position of "Associate Professor". 6 of the scientific publications are impact factor (5 in Q1 and one in Q3, according to the Web of Science), 9 of the scientific publications are impact grade.

3.   General characteristics of the candidate's activity

Prof. Stanislav Harizanov is an established scientist in the field of numerical analysis, theory of approximations and the development of complex computational algorithms designed for modern computer systems. He has made a serious contribution to the promotion of mathematical knowledge as the leading leader of the national mathematics team of the Republic of Bulgaria. He is a leading participant in numerous scientific projects of fundamental importance.

4.   Scientific and applied scientific contributions

The contributions of Assoc. Prof. Stanislav Harizanov are in accordance with the professional field 4.5. Mathematics, scientific specialty "Computational Mathematics". I accept the classification for scientific contributions from the author's reference of the candidate. I. Effective numerical methods for solving problems with abnormal diffusion II. Start optimal numerical algorithms for solving large problems with abnormal diffusion III. Application of mathematics in biology IV. Process optimization In the first scientific field the main results are published in [2, 5, 7, 14]. New quasi-optimal methods and algorithms for numerical solution of problems with fractional degree of the diffusion operator and homogeneous Dirichlet boundary conditions have been developed. The proposed method is based on the best uniform rational approximation (BURA). The results of the second scientific field are published in [1, 3, 4, 11, 17]. A comparative analysis of the effectiveness of the algorithms proposed by the candidate compared to other 3 alternative numerical approaches. All have been shown to lead to one-dimensional rational approximations, with the BURA approach being the most effective. The main achievements in the third direction are published in [9, 10, 15]. A mathematical model of the dynamics of COVID-19 distribution on the territory of the Republic of Bulgaria is proposed. The assumptions in the model and the parameters of the model such as - infection rate, incubation period, recovery period, etc. allow to obtain adequate results for the spread of the virus up to two weeks. The model also takes into account the contribution of vaccination. The fourth area groups results related to significant practical problems requiring significant computational resources such as solving related

tasks, optimizing energy management of buildings, etc .. The results published in [6, 8, 12, 13] are related to a number of numerical experiments and evaluations which support some theoretical results of the candidate.

5. Reflection of the candidate's scientific publications

Assoc. Prof. Stanislav Harizanov presented a reference to the independent citations of his scientific publications in the period after 2018. A total of 40 citations of 4 publications in prestigious specialized scientific journals are given. In the presented report for fulfillment of the minimum requirements the candidate has 240 points with a minimum number of required 140 points.

6. Teaching and participation in projects

From 2018 the candidate is a guest lecturer at FMI-SU. From 2019 is the leader of the national team in mathematics of the Republic of Bulgaria for students. In the period 09 / 2005–12 / 2008 as an assistant in the teaching department at the Department of Mathematics, Jacobs University Bremen, Germany he led exercises in the courses: Numerical Methods, Analysis 1, Linear Algebra and Stochastic Processes. The applicant has submitted declarations from the project managers in which he has participated and is currently a participant. These are projects funded by:

- Research Fund - 7 projects

- HORIZON 2020 - 4 projects • MES - 1 project

- National Innovation Fund - 9 sessions - 1 project

- EU Cost Action - 1 project

- 7th Framework Program of the European Commission - 1 project

7. Assessment of the personal contribution of the candidate

I accept that in the joint articles the candidate has an equal role. In 53% of the leading publications for the competition, the candidate is the first author.

8. Critical remarks and recommendations

I have no critical comments on the submitted materials for the competition. The preparation and guidance of doctoral students by Prof. Stanislav Harizanov will be a good contribution to the development of the potential of IICT.

9.   Personal impressions

I know Assoc. Prof. Stanislav Harizanov from presenting the results of his research and his work in scientific projects at scientific seminars and reports at scientific conferences. The skillful use of the mathematical apparatus in both basic research and a number of applied results is impressive..

10. Conclusion

The candidate in the announced competition Assoc. Prof. Dr. Stanislav Nikolaev Harizanov fully meets the requirements of ZRASRB, the Regulations for implementation of ZRASRB, the Regulations on the terms and conditions for obtaining scientific degrees and holding academic positions in BAS and the Regulations on specific conditions for acquiring scientific degrees and holding academic positions at IICT-BAS. The achieved scientific and scientifically applied results as well as the personal qualities of Assoc. Prof. Stanislav Harizanov give me grounds to propose to be elected to the academic position "Professor" at IICT-BAS in a professional field 4.5. Mathematics, scientific specialty "Computational Mathematics".

11.07.2022 г.

Sofia

На основание

← ЗЗЛД

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