

## OPINION

**in a competition for an academic position  
"Associate Professor"  
in a professional direction 4.5. Mathematics (Mathematical Logic),  
for the needs of Sofia University "St. Kliment Ohridski "(Sofia University),  
Faculty of Mathematics and Informatics (FMI),  
Announced in SG issue 105 of 11.12.2020 and on the websites of FMI and Sofia University**

The opinion was prepared by: Prof. Dr. of Mat. Sci. Dimitar Ivanov Vakarelov, pensioner, member of the extended staff of the Department of Mathematical Logic and Applications at the Faculty of Mathematics and Informatics of S.U. St. Kliment Ohridski in his capacity as a member of the scientific jury of the competition according to the Order of the Rector of Sofia University R-38-84 / 10.02.2021.

Only one candidate has submitted documents for participation in the announced competition: Assistant Professor Dr. Stefan Vladimirov Gerdjikov, Department of Mathematical Logic and Applications at FMI.

### **I. General description of the submitted materials**

**1. Details of the application.** The documents submitted by the competition by the candidate comply with the requirements of requirements of the corresponding Bulgarian Law on Scientific Degrees and Titles and the Regulations on the conditions and procedures for acquiring scientific degrees and occupying academic positions at Sofia University "St. Kliment Ohridski ".

To participate in the competition, the candidate has submitted the following materials:

1. Autobiography.
2. Diploma of higher education and application to it.
3. Diploma for educational and scientific degree "Doctor".
4. Diploma for scientific degree "Doctor of Sciences"
5. Document for scientific title or academic position.
6. Certificate of work experience in the specialty.
7. Documents proving the fulfillment of the requirements under art. 105, para. 1, item 2.
8. Medical certificate certifying his mental and physical health \*\*
9. Certificate of criminal record, certifying the absence of a sentence 'Deprivation of the right to pursue a particular profession or activity.
10. List of publications,
  - (a) list of all publications,
  - (b) list of the publications submitted for participation in the competition
11. List of publications, conferences, projects and scientific manuals generated by the "Authors" system.
12. Reference according to a model for fulfillment of the minimum national requirements for the relevant scientific field and the additional requirements of Sofia University "St. Clement Ohridski "to which the necessary evidence is attached.
13. Reference to the citations with a complete bibliographic description of the cited and citing publications.
14. Information on the original scientific contributions to which the respective ones are attached Evidence.
15. Information on the indicators under Art. 112, par. 2 with appropriate evidence.
16. Scientific papers submitted for participation in the competition, structured and numbered

according to the list under item 10 b.

17. Summaries of peer-reviewed publications in Bulgarian and English.

18. Copy of the announcement in the State Gazette.

**2. Details of the candidate.** In 2006, Stefan Vladimirov Gerdjikov graduated with honors in the Faculty of mathematics and informatics from Sofia University "St. Kliment Ohridski" (Bachelor of Informatics) and in 2008 he also graduated with honors with a master's degree in mathematical logic (Logic and algorithms) with a thesis on "Subsequence converters with additional memory. Regular Rules for Substitution" under the guidance of Assoc. Prof. Dr. Stoyan Mihov. Then in 2014, under his guidance, he prepared and then defended a dissertation (doctor) on "Effective search in regular sets." Since 2012 Gerdjikov started working at FMI, passing successively through the positions of mathematician, assistant and head. assistant.

**3. General characteristics of the scientific works and achievements of the candidate.** Gerdjikov's field of work is computational linguistics and in particular the theory of efficient algorithms applicable in this field. This is a topic that he started with his diploma work in the Department of Mathematical Logic. The full list of Gerdjikov's publications contains 16 articles. Of these, 9 articles were submitted for the competition, of which two were independent and the others were co-authored, 4 of the articles were published in international scientific journals and the remaining 5 are published in the proceedings of international conferences. 19 citations of Gerdjikov's works were found. Articles 1 and 4 are devoted to the axiomatization of monoids. Articles 2 and 3 examine efficient constructions for building bimachines. Article 5 solves a problem of computable geometry. Article 6 examines the relationship between monoids and factorizations. Articles 7, 8 and 9 are devoted to efficient approximate search algorithms. These algorithms are then implemented in specific programs used in computational linguistics. The reviewed articles present Gerdjikov as a young and established scientist in his field. Since most of the articles are co-authored, Gerdjikov tries to describe (although he admits that this is very difficult) his personal contribution to individual articles. I believe in Gerdjikov's words, but in my opinion, this should not be done if there is no signed declaration by the respective co-authors concerning the specific contributions of the co-authors, because the articles can be used by them for such a purpose and then some misunderstandings could be possible. As there is no such declaration, I accept (according to generally accepted international practice) that each of the co-authors has an equal contribution. This does not underestimate the results and does not underestimate the role of the participants in obtaining these results, moreover, that for the given scientific field it is typical for the publications to be the result of collective creative work of more authors.

**4. Characteristics and evaluation of the teaching activity of the candidate.** Gerdjikov reads lectures of a number of disciplines at FMI: "Discrete Structures", "Machine Languages, Complexity and Computability", "Languages, Automata and Computability", "Theory of Machine Learning and Some of Its Applications in Neural Networks", "Grammars, Computability and Complexity", "Fast Algorithms on Data Structures". He also leads student seminars on "logical programming", "Discrete Mathematics" and others.

**5. Critical remarks and recommendations.** I do not have critical remarks and recommendations to the submitted works for review.

**6. Personal impressions of the candidate.** I know Gerdjikov as a student in the master's program "Logic and Algorithms" in our Department. He was one of the most distinguished and active excellent students. After joining the Department, Gerdjikov stood out with his activity in creating the master's program in computational linguistics. His readiness to prepare new courses, lectures and seminars makes a strong impression.

**7. Conclusion on the application.** After getting acquainted with the materials and scientific papers presented in the competition and based on the analysis of their significance and the scientific contributions contained in them, I confirm that the scientific achievements meet the requirements of the Law on its implementation St. Kliment Ohridski "for holding the candidate for the academic position" Associate Professor "in the scientific field and professional field of the competition. In particular, the candidate satisfies the minimum national requirements in the professional field and no plagiarism has been established in the scientific papers submitted at the competition.

I give my positive assessment of the candidacy.

## **II. OVERALL CONCLUSION**

Based on the above, I recommend the scientific jury to propose to the competent authority for the selection of the Faculty of Mathematics and Informatics at Sofia University "St. Kliment Ohridski" to elect Assistant Professor Dr. Stefan Vladimirov Gerdjikov to take the academic position of "Associate Professor" in a professional field 4.5. Mathematics (Mathematical logic).

Sofia, 04.04.2021

Prepared the opinion:

/Prof. Dr. of Mat. Sci. Dimitar Vakarelov/