

STATEMENT

on the competition for the academic position

“Associate Professor”

in professional field 4.6 Informatics and Computer Science (Programming),

at Sofia University “St. Kliment Ohridski” (SU),

Faculty of Mathematics and Informatics (FMI),

announced in State Gazette No.21/15.03.2022 and the internet sites of FMI and SU

This statement is written and submitted by Assoc. Prof. Trifon Anchev Trifonov — FMI, professional field 4.6 Informatics and Computer Science, appointed to the academic jury for this competition by the Rector of SU in accordance with Order ПД 38–232/11.05.2022.

A **single candidate** has submitted an application for this competition:

- Assist. Prof. Ivan Georgiev Hristov, PhD, FMI

I. General Description of the Submitted Documents:

1. Application Details

The documents submitted by the candidate are in full compliance with the requirements of the Academic Staff Development Act (ZRASRB), the Regulations Act for the Implementation of ZRASRB (PPZRASRB), and the Regulations Act about the Terms and Conditions for Acquisition of Academic Degrees and Occupation of Academic Positions at SU (PURPNSZADSU).

For the purposes of the competition Assist. Prof. Ivan Georgiev Hristov, PhD has presented a total of 12 titles, including 12 publications in domestic and international scientific issues and conferences.

The candidate has submitted a total of 6 additional documents supporting the professional achievements.

The additional documents are financing orders, summaries, and reports for projects lead by the candidate, which were issued by the Joint Institute for Nuclear Research (JINR) at Dubna, Russia.

The submitted documents are diligently prepared and well-structured, which aids their evaluation. All papers and citations are accompanied by links to Scopus, which makes them easy to cross-reference.

2. Short Biographical Data

Assist. Prof. Ivan Georgiev Hristov, PhD successfully completed his Bachelor’s degree in Applied Mathematics in 2004, and Master’s degree in Mathematics in the Master’s programme “Computational mathematics”, both of which at FMI. His academic career began the same year, when he started as an Assistant Professor at the chair of Numerical Methods and Algorithms at FMI. In 2010 and 2011 he was promoted to Senior and Chief Assistant Professor, respectively. In 2014 he successfully defended his doctoral thesis in Mathematical modeling and application of mathematics. In 2015 he visited JINR at Dubna for a three-month post-doctoral study, which he repeated the following year for an extended period of fifteen months. In 2017 and 2018 he was entrusted with leading the Bulgarian side of joint research projects with the participation of SU and JINR. In 2018 he transferred to the chair of Computer Informatics, where he works at this moment. Every year he reports on his research on national and international conferences.

3. General Evaluation of Scientific Work and Professional Achievements

The research efforts of Assist. Prof. Ivan Georgiev Hristov, PhD are primarily in the areas of numerical methods and parallel computations, bordering between applied mathematics and programming. His first results date back to 2009 and he continues to work actively in this direction. He has published an impressive amount of papers — 37 in total, all of them in the same scientific field.

The candidate's research is focused in the following areas:

- parallel and efficient computational simulations of dynamic systems;
- simulations of static and dynamic modes in Josephson junctions.

After a detailed review of the submitted scientific publications I confirm that:

- a) the submitted publications are in full compliance with the minimal national requirements under Art. 2B (2) and (3) of ZRASRB, as well as with the additional requirements of SU for the academic position "Associate Professor" in the professional field of this competition;
- b) none of the submitted publications have been submitted in a preceding procedure for acquiring a scientific title or an academic position;
- c) there is no lawful evidence for plagiarism in the submitted publications.

4. Description and Evaluation of Teaching Activities

After starting at the chair of Computer Informatics, Ivan Hristov has been teaching lectures and exercises in Introduction to Programming and Data Structures and Programming to students in Applied Mathematics, Mathematics, and Statistics. He was a lecturer in four instances of these courses. My personal opinion is that he is an especially good fit for teaching these two courses, since he has the ability to present programming topics from the point of view of an applied mathematician. Despite no mention in the presented documents, in a personal conversation the candidate shared that while working at the chair of Numerical Methods and Algorithms he has taught exercises in numerous courses to students of Applied Mathematics and Informatics, including: Numerical Methods, Numerical Methods for Differential Equations, Numerical Methods in Linear Algebra, Numerical Methods in Analysis. The provided report shows that Ivan Hristov regularly fulfills his teaching minimum of auditory and total teaching hours. One master student successfully graduated under his supervision.

5. Analysis of the Content of the Theoretical and Applied Contributions Described in the Submitted Publications

A total of 12 publications were presented, all of them referenced in the scientific database Scopus, including:

- 9 in conference proceedings with SJR [1,2,3,4,6,7,8,9,12];
- 3 in journals with SJR [5,10,11].

All papers are co-authored with Bulgarian and Russian scientists, which is a testament to the candidate's successful collaboration in joint research teams. It should be noted that the papers presented in group Γ of the minimal national criteria exceed the required 200 pts. by 40 pts.

Ivan Hristov provided a short summary of each of the papers grouped in two themes. In all cases he described his individual contribution somewhat tersely as programmatic implementation of parallel algorithms for numerical methods and analysis of the obtained results. Provided I am a specialist in neither of the two research fields

of the candidate, I find it somewhat difficult to evaluate all qualities of his research and applied work. With the above in mind, my review of the presented publications clearly confirmed:

- a fluent and skillful application of libraries and frameworks for parallel and scientific computations (MPI, OpenMP, GMP);
- application of techniques for efficient parallelizing of existing algorithms, which lead to improvement of existing results;
- analysis of the asymptotic complexity of the obtained results;
- close familiarity with the details and peculiarities of a variety of architectures for parallel and distributed computations, as well as overcoming of technical hurdles for achieving a high performance and efficient utilization of computational resources;
- conducting of numerical experiments and comparative analysis of the obtained results under varying different parameters of the simulation;
- analysis of the computational error in the experiments.

Quite logically, the papers of Ivan Hristov before 2015 (second thematic group) are focused on numerical methods, while his subsequent papers (first thematic group) the focus was shifted to efficient parallel computations. The unifying factor is the candidate's contribution to the programmatic implementation, which leads me to conclude that all presented publications are relevant to the topic of this competition.

6. Critical Remarks and Recommendations

My only remark concerning the presented materials is that most of the papers do not provide a reference to a digital resource with the relevant program code, which is a significant part of the candidate's scientific contribution. The last papers reference a Github repository, which is a good practice I fully endorse.

I have the following recommendations towards Ivan Hristov concerning his future work:

- continue working with young scientists and act as a scientific advisor not only to master students, but also to doctoral students;
- continue his active research by publishing papers in which he is the single author.

7. Personal Impressions

I know Ivan Hristov as a colleague at FMI even before he transferred to the chair of Computer Informatics. He always struck me as an exceptionally humble, hard-working, calm person, who is keeping to his principles. During our conversations I noticed his ability to present his opinion on various topics clearly and concisely. I was impressed that he was the only colleague who attended my lectures in order to collect ideas and impressions for his teaching work, a fact, which, I believe, clearly speaks to his dedication.

8. Conclusion

Based on the review of the documents and scientific publications submitted for this competition, as well as on the analysis of their significance and the theoretical and applied contributions, I hereby confirm that the scientific achievements of the candidate meet and exceed the requirements of ZRASRB, PPZRASRB, and PURPNSZADSU for acquiring the academic position "Associate Professor" in the scientific and professional field of this competition. More specifically, the candidate satisfies the minimal national requirements of the professional field and no plagiarism has been detected in the submitted scientific publications submitted.

I hereby state my **positive** assessment of the application of Assist. Prof. Ivan Georgiev Hristov, PhD.

II. GENERAL CONCLUSION

Based on the above, I hereby **recommend** to the scientific jury to propose to the competent authority of the Faculty of Mathematics and Informatics at Sofia University “St. Kliment Ohridski” to elect Assist. Prof. Ivan Georgiev Hristov, PhD to the academic position “Associate Professor” in professional field 4.6 Informatics and Computer Science (Programming).

June 28, 2022

Prepared by: _____
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