

OPINION

УНИВЕРСИТЕТ
„Проф. Д-р Асен Златаров“
8010 Бургас, бул. „Проф. Якимов“ №1

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By Prof. Tania Koleva Pencheva, PhD

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For the concourse for promotion to the academic position “Associate Professor”,
announced in **State Gazette, issue 70 from 20.08.2024**

Area of Higher Education: **5. Technical Sciences**

Professional Field: **5.3. Communication and Computer Technology**

Scientific Specialty: **Systems with Intelligent Behaviour**

Candidate: **Senior Assist. Prof. Eng. Todor Petkov Petkov, PhD**

Review of the presented materials

With Ordinance No. 359/25.10.2024 of the Rector of the University “Prof. D-r Assen Zlatarov” – Burgas, I have been appointed as a member of the Scientific Jury in a **concourse for the academic position “Associate Professor”** where the only candidate is **Senior Assist. Prof. Eng. Todor Petkov Petkov, PhD**.

As a member of the Scientific Jury, I have received:

1. Documents regarding the candidate's participation in the concourse.
2. Copies of the publications submitted for participation in the concourse.

In the presented form, the documents of Todor Petkov meet to a great extent the requirements stipulated in the Act on Development of the Academic Staff in the Republic of Bulgaria (ADASRB), as well as the regulations for its implementation, approved by the Council of Ministers and the University “Prof. D-r Assen Zlatarov” – Burgas, **with the exception of unprovided lists of publications for participation in the concourse and of the publications used in the dissertation for the acquisition of the educational and scientific degree “doctor” (PhD)** that present evidence that the publications submitted for participation in this concourse **do not repeat** those submitted for the acquisition of the educational and scientific degree “doctor”. A synopsis of the defended dissertation **has not been presented** either. By coincidence, I had the honour of being a member of the Scientific Jury of Todor Petkov for the **acquisition of the educational and scientific degree “doctor”**, which gives me a reason to be convinced that the publications submitted in this concourse **do not repeat** those used in his **dissertation for the acquisition of the educational and scientific degree “doctor”**.

Short biographic notes

Todor Petkov graduated as M.Sc. of “Communication and Computer Technology” at the University “Prof. D-r Assen Zlatarov” – Burgas in 2012. He began his scientific career as a PhD student at the University “Prof. D-r Assen Zlatarov” – Burgas (2013-2015) in the scientific specialty “Communication and Computer Technology”. In 2016, he defended a PhD thesis on the topic “Generalized Net Models of Neural Networks”. In 2018, Todor Petkov was elected to the academic position of Senior Assistant Professor in the “Communication and Computer Technology” Department at the University “Prof. D-r Assen Zlatarov” – Burgas. The scientific interests of Todor Petkov are in the fields of the field of application of neural networks and other intelligent methods in modelling of real processes, as well as in the application of modern technologies in student education.

Publication and lecturing activities, project participation

For participation in the concourse for promotion to the academic position “Associate Professor”, Todor Petkov has presented **32 scientific publications**, of which **28 papers in international journals and 4 journals in Bulgaria**. In the document “*Reference for minimal requirements*”, which is the only one that presents a list of publications for participation in the concourse, classified by the candidate in the relevant groups of indicators, **no data is provided** regarding the **impact factor** or **impact rank** of the publications.

According to a reference I made, the number of articles with an **impact factor** is 3, and those with an **impact rank** – 8.

I would also like to point out a few inaccuracies in the number of points in the provided "*Reference for minimal requirements*": 1) In **Group of Indicators B**, **publication 5** should bring 7.5 instead of 8.57 points, **publication 6** – 6.66 instead of 7.5 points, and **publication 9** – 6 instead of 5.45 points. With these corrections, the total number of points under **Group of Indicators B** should be **reduced by 1.36 points to 100.72 points**, which is still **above the minimum of 100 points required** under this group of indicators. 2) The correct amount under **Group of Indicators D** is **310.14 points**, not **309.84 points** as presented in the *Reference for minimal requirements*. 3) The candidate in the concourse did not take into account the fact that **publications 28 and 32** are in the journal *Notes on Intuitionistic Fuzzy Sets*, which is already indexed in Scopus. Due to this fact, these 2 publications should be classified in the category above and be assigned 10 and 13.3 points, respectively (instead of 5 and 6.66, respectively). After this correction, the total number of points under **Group of indicators D** should be **321.78**, which is also above the **minimum of 300 points required** under this group of indicators.

I would also like to point out the fact that in **3** of the 32 publications presented for the concourse **Todor Petkov is the single author**, and in **10** of the collective works **he is the first author**. This fact irrefutably shows the **personal input of the candidate** in his research developments. I recognize all publications by Todor Petkov presented for the concourse as fully compliant with the requirements for proven excellence of the scientific publications, as well as strictly relevant to the thematic scope of the concourse.

In "*Reference for minimal requirements*" Todor Petkov also presents a list of **89 citations**, whereby with **890 points** he exceeds many times the **minimum of 100 points required** under **Group of Indicators E**.

Todor Petkov has provided a list of participation in **2 national** and **5 international projects**, whereby with **120 points** he covers and exceeds the **minimum of 100 points required** under **Group of indicators F**. In addition, in the "*Projects List*", a report of Todor Petkov's participation in 6 intra-university projects has been provided, in 1 of which he was also **the principal investigator**.

According to the "*CV Europass Todor Petkov*" and "*Workload Report*", from 2020 to the present, Todor Petkov has led **lectures and tutorials** in a number of disciplines in bachelor's and master's programmes at the University "Prof. D-r Assen Zlatarov" – Burgas, including Programming of Mobile Devices; Digital Circuit Engineering; Computer Architectures; Computer Systems; Specialization Practice; Neural Networks; Computer Vision. Todor Petkov is also a co-author of "*Handbook on Digital Circuit Engineering*" (2016). To date, Todor Petkov has been the supervisor of **11 graduate students**, which is sufficient evidence to confidently believe that he has all the necessary qualities to supervise PhD students.

All of the above presents the candidate in the concourse for promotion to the academic position "Associate Professor" Todor Petkov as a fully competent specialist in the field of application of neural networks and other intelligent methods in modelling of real processes, as well as in the application of modern technologies in student education.

Analysis of the main fundamental and applied research contributions

Todor Petkov has presented an Author's Reference with defined **14 contributions** in **4 separate groups**, briefly presented as follows:

1. "Modelling and application of neural networks": In this area, Todor Petkov has formulated **4 contributions of a scientific and scientific-applied nature**, related to the development and application of a new method for hierarchical data clustering, to the development of a design of a modular neural network with the approach of intercriteria analysis, to the determination of intuitionistic fuzzy evaluations and testing of different types of neural networks with and without self-learning, as well as to the application of neural networks in electronics and to the development of generalized network models of different types of neural networks.
2. "Prediction of properties of chemical compounds": In this area, Todor Petkov has formulated **3 contributions of a scientific-applied and purely applied nature**, related to the prediction of the explosive properties of compounds through their thermodynamic and kinetic characteristics, applying purposefully developed software for simulation and visualization, as well as the development of

a flowchart for predicting acute oral toxicity of chemical compounds, which has been validated and verified in a specialized programming environment.

3. "Application and modelling of intelligent methods for real processes": In this area, Todor Petkov has formulated **3 contributions of a scientific-applied and purely applied nature**, related to the development of generalized nets models of the classification process and of a biometric system for human authentication through fingerprinting and eye behaviour tracking, the development of an approach for recognizing facial features with intuitionistic fuzzy estimates, modelling of logistic regression with the MapReduce algorithm, programme implementation and visual simulation of the K-Means algorithm, as well as the application of the intercriteria analysis approach for decision-making in various areas.
4. "Application of modern technologies in education": In this area, Todor Petkov has formulated **4 contributions of a scientific-applied and purely applied nature**, related to the application of virtual reality for educational purposes through the development of 3D models of human anatomical parts and chemical compounds and a comparative analysis of individual applications of virtual reality and the identification of its key components, as well as the application of the theory of generalized nets and intuitionistic fuzzy logic for quality assessment of universities and scientific organizations.

I consider the so formulated contributions of Todor Petkov as original and reflecting his overall scientific research activity. I am convinced in my opinion that his contributions are of essential importance for the development of the field of research on the application of modern informatics approaches for the purposes of modelling and investigating various objects. The relatively high number of citations of the research works of Todor Petkov is yet another independent testimony for the quality of the excellent research results achieved with his active participation.

Personal impressions

I have known Todor Petkov personally since the defence of his dissertation for the acquisition of the educational and scientific degree "doctor", and subsequently through his scientific research activities and his presentations at a number of scientific forums. Over the years, Todor Petkov has established himself as a **responsible, conscientious, hard-working and diligent colleague**. All of these personal qualities are demonstrated in the materials presented by Todor Petkov for participation in the present concourse for the academic position "Associate Professor".

Conclusion

In the formation of the final assessment of the candidate Todor Petkov for promotion to the academic position "Associate Professor", the requirements of the ADASRB have to be taken into consideration, as well as the regulations for its implementations approved by the Council of Ministers, and the University "Prof. D-r Assen Zlatarov" – Burgas. According to the presented documents and their analysis, **Senior Assist. Prof. Todor Petkov meets, and even surpasses, the requirements for the academic position "Associate Professor"**.

On the basis of the presented concourse documents and the candidate's publications, which provide visibility of the obtained results, as well as on the basis of the notability of the scientific contributions included thereof, I take the liberty to recommend to the respected members of the Scientific Jury to propose to the respected members of the Faculty Council of the Faculty of Technical Sciences at the University "Prof. D-r Assen Zlatarov" – Burgas to vote for the promotion of **Senior Assist. Prof. Eng. Todor Petkov Petkov, PhD** to the academic position "**Associate Professor**" in Professional Field **5.3. Communication and Computer Technology**, Scientific Specialty **Systems with Intelligent Behaviour**.

14 January 2025
Sofia

Signature:
(Prof. Tania Pencheva, PhD)