

## **REVIEW**

by Professor Todor Stoyanov Djamiykov, Eng., PhD, Technical University - Sofia of the materials submitted for participation in the competition for the academic position of "Professor" of Plovdiv University "Paisii Hilendarski" in the field of higher education 5. Technical sciences professional field 5.1. Mechanical engineering (Automation of engineering work and automated design systems), in the competition for the post of 'professor' announced in the State Gazette, no. 96 of 17.11.2023 and in the Internet page of Plovdiv University "Paisii Hilendarski" for the needs of the Department of Mechanical Engineering and Transport at the Faculty of Physics and Technology, as a candidate participated Assoc. Prof. Dr. Slavi Yassenov Lyubomirov from Plovdiv University "Paisii Hilendarski".

### **1. General description of the materials presented**

By Order No. RD-21-385 of 16.02.2024 of the Rector of Plovdiv University "Paisii Hilendarski" (PU) I have been appointed as a member of the scientific jury of the competition for the academic position "Professor" in PU in the field of higher education 5. 5.1. Mechanical Engineering (Automation of Engineering Work and Automated Design Systems), announced for the needs of the Department of Mechanical Engineering and Transport at the Faculty of Physics and Technology. For participation in the announced competition documents were submitted by a single candidate: Assoc. Prof. Dr. Slavi Yassenov Lyubomirov from Plovdiv University "Paisii Hilendarski".

The paper submitted by Assoc. Dr. Slavi Yassenov Lyubomirov's set of materials on paper is in accordance with the Regulations for the Development of the Academic Staff of PU, and includes the following documents: application form to the Rector for admission to the competition; curriculum vitae in European format; copy of the diploma of higher education with the degree of Master; copy of the diploma of the degree of Doctor of Education and Science; a copy of the certificate of the academic position "Docent"; a list of scientific works; scientific works (copies of publications); a statement of compliance with the minimum national requirements; a declaration of originality and authenticity of the attached documents; annotations of the materials under Art. 76. of the PRASPU (in Bulgarian and English); self-assessment of contributions; list of citations; document of work experience; documents for

teaching work; documents for research activity; documents for participation in research projects and other documents such as certificates; attestations, etc.

The candidate Assoc. Prof. Dr. Slavi Yasenov Lyubomirov has attached a total of 93 scientific papers, 1 monograph, 1 book, 7 textbooks and teaching aids and a list of 14 research papers. 1 habilitation work - monograph, 52 scientific works which are outside the dissertation and are counted in the final evaluation, 1 textbook, 1 textbook and participation in 14 scientific research projects are accepted for review. Not reviewed from the list; the dissertation for the acquisition of the scientific and educational degree - PhD, 7 scientific works on the dissertation, textbooks and teaching aids - 5 pieces, 1 book on the basis of a defended dissertation for the award of the educational and scientific degree "PhD" and 33 scientific works for the occupation of the academic position of associate professor. The distribution of the scientific works under the relevant headings, at home and abroad, is as follows 25 are presented abroad and 27 are presented at home. A list of 41 noted citations beyond those used for the post of Associate Professor is presented. Documents (in the form of service notes) for a published patent or utility model application are also submitted. He holds a registered utility model with Reg. No 4664.

## **2. Information about the candidate**

Assoc. Prof. Dr. Slavi Lyubomirov was born in 1970. Since 1999 he is a Master Engineer in Computer Systems with specialization in Information Technology, from Technical University of Sofia - Plovdiv Branch. In 2013, he defended his dissertation on "Research of hardware and software for digital relay protection" and obtained the degree of Doctor of Education and Science in the scientific specialty 5.2. Electronics, Electrical Engineering and Automation from the Technical University - Sofia. He started his professional activity in 2002 as an assistant professor at the Technical College - Smolyan at Plovdiv University "Paisii Hilendarski". Since 2015 he has held the academic position of Associate Professor at Paisii Hilendarski University of Plovdiv.

The professional biography of Assoc. Prof. Dr. Slavi Yasenov Lyubomirov gives me reason to believe that he possesses great experience, accumulated knowledge and skills in the field of academic technical and teaching areas.

## **3. General characteristics of the candidate's activity**

From the materials submitted for participation in the competition for the academic position "Professor" of Assoc. Prof. Dr. Slavi Lyubomirov it is evident that

he has published 1 habilitation work - a monograph "Digital tools and systems for automated design in mechanical engineering". He is the author of 1 textbook and 1 textbook. The 10 design-based electronic courses developed by him are used for the training of students at the Faculty of Physics and Technology of Paisii Hilendarski University. Assoc. Prof. Dr. Slavi Lyubomi-rov has provided a report on work with students and PhD students, which shows that he has defended 26 diploma students and 27 reviews of diploma theses. There are 38 publications with the participation of students and PhD students. He is a scientific supervisor of 4 PhD students, of which 2 have successfully defended.

The presented materials eloquently show his active out-of-classroom and in-classroom teaching activities in working with students.

Assoc. Prof. Dr. Slavi Lyubomirov presents 1 habilitation thesis - monograph, which is devoted to the current topic of digital tools and systems for automated design in mechanical engineering. The monographic work has a volume of 218 pages.

The distribution of the scientific works by relevant headings, in the country and abroad, is as follows: 11 scientific publications in journals that are refereed and indexed in world-known databases of scientific information and are published in Web of Science and Scopus. from group D7.1. to D7.11. 41 scientific publications in non-refereed peer-reviewed journals or in edited collective volumes have been submitted.

The candidate's submitted scientific works do not overlap his/her participation in other procedures.

All publications were made at conferences and scientific publications in Bulgaria and abroad. 7 publications are independent, with two co-authors - 20 issues; with three or more co-authors - 25 issues). 6 articles; 46 papers; awarded publications - 1 issue. By place of publication (articles in refereed international journals - 6 issues, papers in proceedings of international scientific conferences abroad - 19 issues; papers in proceedings of international scientific conferences in Bulgaria - 16 issues; papers in proceedings of national scientific conferences, sessions and seminars - 5 issues; papers in proceedings of universities - 6 issues; by language in which they were written; in English - 41 issues, in Bulgarian - 11 issues. They have scientific and applied significance directly related to the present competition for "professor" at PU in the field of higher education 5. Technical sciences, professional field, 5.1. Mechanical engineering (Automation of

engineering work and automated design systems) I accept the publication activity as fully sufficient in volume, at a high level and sufficiently promoted in national and international scientific plan.

All scientific publications submitted are in the field of the competition. They are subject to analysis in the very detailed self-assessment of the contributions by groups of indicators and by thematic areas compiled by Dr Slavi Lyubomirov. Regardless of their general focus in the field of the competition, they can be divided and analysed in the following areas:

***Scientific and applied contributions***

1. Electronic systems and an experimental methodology for improving the harmful emissions of automotive vehicles and investigating various malfunctions of internal combustion engines of the vehicle have been developed, put into practice and tested, [D8.15], [D8.16], [D8.24], [D8.26], [D8.27] and [D8.29].

2 Design and investigate material properties for additive manufacturing in 3D printing [D8.39]. A comprehensive analysis of scanning techniques [D7.8], [D7.9], [D7.11] and [D8.4] has been performed, a 3D virtualised three-dimensional object has been generated from an existing building using Blender software and successfully linked to virtual reality tools [D8.38]. Implementation of 3D printing in the automotive industry, through the process of projecting and fabricating a functional part of the vehicle [D8.37], etc.

***Applied contributions***

1. The principles and capabilities of Controllino PLC as a means of control and management of automated processes are investigated, as well as prototypes for industrial purposes [D8.10].

2. A practical approach to the recovery of a gerotor pump used in the hydraulic boosters of a car is developed and illustrated. A methodology for the recovery of a gerotor pump on automotive hydraulic boosters is presented [D8.35].

3. A methodology for automated pro-design of fixtures in the conditions of CAD environments used in the training of students of mechanical engineering specialties was developed and put into practice, prototypes of the models were created using a 3D printer Creat Bot PEEK - 300 [D8.40] and [D8.41], etc.

The candidate has submitted a list of noted citations - 41 in number, out-of those used for the academic position of Associate Professor. From the list of citations provided, it is noticeable that 21 citations are from foreign authors. The information

on citations in scientific journals referenced and indexed in world-renowned databases of scientific information Web of Science and Scopus by year is as follows: for 2020: 5 citations; for 2021: 12 citations; for 2022: 8 citations and for 2023: 2 citations. A total of 27 citations in Web of Science and Scopus for the last 4 years. The remaining 14 citations are in peer-reviewed collective volumes and in non-peer-reviewed journals. 3 Impact Factor citations were noted. In the number of citations listed, I did not see any author citations, which is a good testimonial.

An application from the patent office of the Republic of Bulgaria for registration of a utility model has been submitted.

It is quite reasonable to summarize, on the basis of the scientific publications presented and the reference of contributions compiled by Dr. Slavi Lyubomirov, that the main contributions are scientific and applied. They are closely related to the presented applied contributions and are also the basis for their application in the teaching process and in the development of scientific projects (list of scientific research projects presented).

The importance of the contributions in the scientific publications is confirmed by the 41 citations from other scientists from Bulgaria and abroad. The comparison between the table "Minimum national requirements" for the procedure for the academic position of professor in professional fields and the table presented by the candidate Assoc. Slavi Lyubomirov (8. Reference to the minimum national requirements - Annex 1), shows the fulfilment of the criteria in all groups of indicators, with those of "D, E and F" almost twice as many points.

#### **4. Evaluation of the personal contribution of the candidate**

I believe that the personal contribution of Dr Slavi Lyubomirov in the publications presented to the scientific community is undeniable and substantial. I have consulted "SCOPUS" for 17 documents, h-factor - 2, 12 co-authors and 43 citations. In the mentioned number of citations, there are no author citations, which is commendable. The statistics on the number of co-authors in the publications shows: independent - 1, with one co-author - 20, the remaining 12 publications have more than two co-authors. In the majority is at the top of the list of authors, which indicates the significant share in shaping and presentation of publications. No distribution protocol has been presented, but there is no reason to doubt the active

participation of Assoc. Prof. Dr. Slavi Lyubomirov in the publications presented by him.

I believe that the personal contribution of Assoc. Prof. Dr. Slavi Lyubomirov in the publications presented to the scientific community is undeniable and substantial. I am convinced that the scientific, scientific-applied and applied contributions in the candidate's works fully meet the requirements for the academic position of Professor.

#### **5. Critical comments and recommendations**

I have the following remarks to the evaluated materials presented in the competition, which do not diminish the significance of the obtained results, but rather can be considered as recommendations to the future creative activity of Dr. Slavi Lyubomirov.

1. The summaries and judgments on the results of the publications could be made more exactly, which would lead to a more accurate and representative presentation of the contributions.
2. I would recommend to focus and devote time to an extensive and detailed summary of the use of modern hardware and software solutions for automated design, 3D prototyping and testing and their implementation in the training process of students, which to publish actively in prestigious foreign publications of high rank.

#### **6. Personal impressions**

I have known Assoc. Prof. Dr. Slavi Lyubomirov since approximately 2015, from the time of his PhD studies at FETT of TU-Sofia. I can note that he has a very good theoretical and practical background in the field of competition. He has an affinity for in-depth theoretical and methodological research with, the use of modern research methods. As a professor, he should concentrate his efforts on finding one area in the broad field of interest that can become leading edge and have some independence. I think he is an excellent professor with good research potential. I have no publications in common with him and I am not a related person within the meaning of the law.

#### **Conclusion**

The documents and materials submitted by Assoc. Prof. Dr. Slavi Yassenov Lyubomirov meet all the requirements of the Law for the Development of Academic Staff in the Republic of Bulgaria (LADAB), the Regulations for the Implementation of the LADAB and the relevant Regulations of Paisii Hilendarski University. The

candidate in the competition has submitted a sufficient number of scientific works published after the materials used in the defence of the PhD and scientific works for the academic position of Associate Professor. The candidate's works contain original scientific and applied contributions that have received international recognition, a representative part of which have been published in journals and scientific collections published by international academic publishers. His theoretical developments have practical applicability, as some of them are directly oriented to teaching work. The scientific and teaching qualifications of Assoc. Prof. Dr. Slavi Lyubomirov cannot be questioned. The results achieved by Assoc. Prof. Dr. Slavi Yassenov Lyubomirov in teaching and research activities fully comply with the minimum national and additional requirements of the Faculty of Physics and Technology, adopted in conjunction with the Regulations of the PU for the application of the Law on Physics and Technology. After familiarization with the materials and scientific works presented in the competition, analysis of their significance and scientific, scientific-applied and applied contributions contained therein, I find it justified to give my **positive** assessment and recommend the Scientific Jury to prepare a report-proposal to the Faculty Council of the Faculty of Physics and Technology at Paisii Hilendarski University of Plovdiv for the election of Assoc. Dr. Slavi Yassenov Lyubomirov to the academic position of "Professor" at Paisii Hilendarski University of Physics and Technology in the following fields of higher education 5. Technical sciences, professional field 5.1. Mechanical engineering (Automation of engineering work and automated design systems).

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Reviewer: .....  
(Prof. Todor Stoyanov Djamiykov, Eng., PhD)