

OPINION

on concourse for achieving academic position “Associate Professor”,
professional direction 5.2. Electrical Engineering, Electronics and Automation,
Specialty “Automated systems for information processing and control”,
published in the State Gazette No. 85 from 29.10. for the needs of department “Embedded
Intelligent Technologies” of IICT-BAS

Candidate:

Chief. Assist. Prof. eng. Nikolay Ivanov Stoimenov, PhD
Department “Embedded Intelligent Technologies”
Institute of Information and Communication Technologies,
Bulgarian Academy of Sciences.

Member of the Scientific Jury:

Prof. eng. Lubomir Vankov Dimitrov, PhD
Department: “Machine elements and non-metallic structures”,
Faculty of Mechanical Engineering of TU-Sofia,
Nominated with Order No. 347/30.12.2019 of the Director of IICT-BAS

1. General characteristics of the candidate's scientific and applied activities.

Scientific interests and professional realization of Chief Assist. Prof. Nikolay Ivanov Stoimenov, PhD are in the field of innovative methods and tools for digitization of cultural and historical heritage, health and quality of life, new materials and technologies, ICT, temperature processes and high-speed processes, automation of discrete production with applications in the preservation and digitization of cultural and historical heritage; innovative technologies in the process of grinding and manufacturing of details; non-destructive analysis and control, and automation of the production.

The candidate participates in the competition with 10 scientific papers of a monographic nature in publications that are referenced and indexed in world-famous databases of scientific information (Web of Science and Scopus), according to Art. 25 para. 1 item 3 of the Act of the Development of the Academic Personnel of the Republic of Bulgaria. No unifying title is specified. Of these, 4 have 3 co-authors, 1 with 4 co-authors, 1 with 5 co-authors, 2 with 6 co-authors, 1 with 7 co-authors, and 1 with 8 co-authors.

The candidate has also submitted a list of 28 scientific publications, other than the publications of monographic nature. Of these, 7 are in peer-reviewed journals, 4 independent publications and a published chapter of a collective monograph in English and Italian, published in 2015 by Pavia University Press, Pavia, Italy.

The 28 scientific publications submitted to the competition could be conditionally divided as follows:

- 6 pcs are published in proceedings and journals from scientific forums abroad;
- 18 pcs are published in Bulgarian proceedings and periodicals;
- Independent publications are 4 pcs;

The candidate has 16 noted citations, 5 of which are visible in the Scopus worldwide database, 2 in dissertation in Bulgaria, 1 in the dissertation abroad, and 8 of them in Bulgarian journals and proceedings.

According to the enclosed reference Chief. Assist. Prof. eng. Nikolay Stoimenov, PhD, has participated in 2 research projects, and he is head of the project in one of them.

The candidate has also submitted a reference for 1 published Patent Application of the Republic of Bulgaria, Thermometer, Reg. No. 112368, priority from 05.08.2016.

The analysis of the scientific research and applied developments presented by the candidate shows that the scientometric requirements according to the law for the conditions and the order of occupation of the academic position “Associate Professor” and the additional requirements of IICT-BAS are covered.

2. General scientific, scientific-applied and applied contributions.

Chief. Assist. Prof. Nikolay Stoimenov has enclosed a detailed author's reference on the contributions in the 10 publications of a monographic nature, as well as on the contributions of his other publications. The candidate's contributions are of a scientific and applied nature. Of the presented contributions, for more significant I consider:

2.1 Scientific-applied contributions.

1. In the field of preservation and digitalization of cultural and historical heritage: New methods are proposed for the preservation and digitalization of cultural and historical heritage sites aiming to help and improve the quality of life of disadvantaged people (blind or visually impaired). Methods have been developed for 3D digitalization and 3D modeling of objects of cultural and historical heritage, as well as their advantages. Using methods that can be classified among hybrid solutions, an example of tactile plates for the blind is given.
2. In the field of innovative technologies in grinding processes: An innovative shape of grinding media is proposed, which is used in the production of cement, mining and others. The factors involved in ensuring the productivity and efficiency of grinding of the material in the drum mill have been identified. Examples are given of increasing the productivity and efficiency of grinding in mills. High-temperature processes for the production of milling materials, in particular for lifters, are discussed. A grinding media testing method is proposed which scans the inner part of mills, thereby determining the wear of the grinding media in the mills. Grinding media studies have been carried out, as well as a comparative analysis between standard grinding media and innovative grinding media proposed by the author, protected by a patent application.
3. In the field of non-destructive analysis and control: Laser ablation studies of dental specimens have been performed by 3D computerized tomography. The micro cavitation depth of extracted dental specimens was determined. The impact of different dental ablation laser modes in different operating modes is determined by computed tomography. A methodology for conducting the study has been developed. Laser nano particle sizer studies and analyzes have been used to determine the separation of carbon nanoparticles of different size and shape from nanocomposites.
4. In the field of production automation: a theoretical analysis has been made, the need for packaging has been considered, and options for automation of assembly operations in the production of mattress frames have been considered.

3.2. Applied contributions.

On the basis of the author's developments and as a result of his scientific-applied contributions, tactile tiles for the blind have been developed, and the internal structure of road surfaces has been studied, that I could attribute to his applied contributions:

1. By using the methods and tools described in the scientific contributions to preserve and digitize the cultural and historical heritage, 7 tactile tapestry plates were developed with scenes from the Battle of Pavia 1525. Tactile plates are exhibited at the international event EXPO 2015, Milan, Italy.
2. Another development finds application in the Brera Gallery, Milan. There, along with the original masterpiece "Jesus Christ and the Samaritan woman at the well" by Anibal Karachi (1555), is placed a tactile tile for the blind, developed according to the methods described.

3. Significance of the contributions to science and practice.

In my opinion, the volume and quality of the research work carried out by the applicant and the corresponding contributions from it completely cover the requirements of the Law on the Development of Academic Staff in the Republic of Bulgaria.

The scientific-applied contributions presented in the publications developed by Chief Assist. Prof. Nikolay Stoimenov, PhD, undoubtedly have the necessary importance for the development and enrichment of the scientific field of the competition – “Automated systems for information processing and control”

4. Critical notes and recommendations.

In the presented publications by the applicant, I did not find any fundamental gaps. There are also no significant errors and inaccuracies in the developed methodologies, algorithms, theoretical and experimental studies.

I would like to recommend to the applicant to continue his successful scientific career by focusing on the publication of scientific studies with impact factor A or publication in the Scopus database.

6. Personal impressions.

I know the applicant personally and I have very good impressions of him and his work as a researcher.

Conclusion

On the basis of my acquaintance with the presented materials on the competition, my personal impressions, taking into account the relevance and importance of the scientific, scientific-applied, applied and methodological contributions contained in scientific works, the achieved implementation in practice, I find it quite reasonable to recommend to the distinguished Scientific jury to positively evaluate the scientific works on the competition and to propose to the Scientific Council of IICT-BAS, Chief. Assist. Prof. Nikolay Ivanov Stoimenov, PhD, to be elected to the academic position of "Associate Professor" in the field 5. “Technical Sciences”, professional field 5.2. “Electrical Engineering, Electronics and Automation”, specialty in “Automated systems for information processing and control”.

Sofia,
16 January, 2020.

Member of the Scientific Jury:.....
Prof. eng. Lubomir Vankov Dimitrov, PhD

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