

STATEMENT

in competition for the academic position "Professor" in the professional field 5.2. Electrical Engineering, Electronics and Automation, specialty "Automated Information Processing and Control Systems", announced in the State Gazette No. 103 of 12.12.2023 for the needs of the Department "Distributed information and control systems",

Member of the scientific jury: Prof. Dr. Pancho Tomov.

1. General applications and bibliographical data

In the announced competition, the only candidate is Assoc. Prof. Dr. Nikolay Stoimenov. In 2013 he graduated from Technical University - Sofia, Faculty of Mechanical Engineering. He defended his doctoral dissertation on "Study of movement and interaction of different shape bodies". Since 2020 he has been an Associate Professor at the Institute of Information and Communication Technologies at the Bulgarian Academy of Sciences (ICT-BAS), department "Distributed Information and Control Systems", and since 2021 he has been the head of the same department.

2. Overall description of the submitted materials

The candidate Assoc. Prof. Dr. Nikolay Stoimenov participated in the announced competition for the academic position "Professor" with a list of 12 scientific papers in publications indexed and refereed in the world-famous database of scientific information - Scopus. The publications are according to indicator B, and the requirements in the Regulations on the specific conditions for the acquisition of scientific degrees and for the occupation of academic positions in the ICT-BAS are not less than 10. Of the submitted publications, 1 is independent, 2 are co-authored with one co-author, 7 are with two co-authors, 2 are with three co-authors, and most of them are on projects led by him.

Outside of these publications, a list of 24 papers that have been refereed and indexed in world-renowned scientific databases Scopus is presented. Of these, 2 are co-authored with one co-author, 13 with two co-authors, 1 with three co-authors, 9 with 4 co-authors, 2 each with 5 and 6 co-authors, and one with 8 co-authors. The remaining 20 papers are in peer-reviewed non-refereed journals or edited collective volumes, 5 of which have a first co-author. The list also contains a chapter of a monograph not submitted as a major habilitation paper.

A list of 37 independent citations in journals refereed and indexed in world-renowned databases of scientific information and a list of 22 citations in non-refereed peer-reviewed journals are presented.

The candidate has also submitted a list of 6 projects to the NSP, OP-SESG, and NSF, 3 of which he is the team leader (NSF). A list of inventions and other scientific and applied results has been submitted, which includes one patent and two utility models.

The table shows the summarised requirements for the national minimum requirements, the requirements of the ICT-BAS, and the indicators declared by the scientists.

The analysis of the table shows that all groups of indicators of the Act of the Development of the Academic Personnel of the Republic of Bulgaria (ADAPRB), the Rules of

the Academic Personnel of the Republic of Bulgaria, the Rules for the conditions, and the procedure for acquiring scientific degrees and for the occupation of academic position in the Institute of Information and Communication Technologies of the BAS are exceeded.

Table 1. Data of the Candidate.

Group	National Requirements	Requirements of the IICT-BAS	Declared number of candidate's points
A	50	50	50
B	100	100	290
Г	200	220	365,3
Д	100	120	414
Е	150	150	243,6

3. General characteristics of the candidate's scientific research applied scientific and pedagogical activities

The candidate has submitted for participation 57 works, including one chapter of a collective monograph on a wide range of thematic areas, the main of which are:

1. Processes of motion and behaviour of grinding bodies and media – papers Group indicators B4 № 2, 4, 6, 7, 8, 11, indicator Г7 № 6.
2. Durability of 3D printed materials including composites – papers Group indicators B4 № 9, и 10, indicators Г7 № 23.
3. 3D Simulation Modeling, 3D Scanning and 3D Printing – papers Group indicators B4 № 1, 3, 5, 12.
4. Developed specialized gripper-dispenser for accurate filling of laboratory ball mill with grinding bodies and holder for sample bodies – papers Group indicators Г7 № 12, 18.
5. Friction coefficients of different 3D printed materials have been experimentally and simulatively determined and their tribological properties have been investigated – papers Group indicators Г7 № 13, 14, 22.
6. Developed 3D objects of buildings, paintings, Braille symbols, and educational materials exploring their properties for tactile suitability by representing visually impaired and blind people – papers Group indicators Г7 № 1, 7, 15, 17.
7. Properties of sintered powders, diamond coatings, internal workpiece structure, and robotic drilling have been investigated by various methods and means including non-contact – papers Group indicators Г7 № 2, 3, 4, 5, 7, 8, 9, 10, 11, 16, 20, 21.
8. An analysis of robotic cleaning systems is made, methodologies and simulation models of robotic cleaning systems are created – papers Group indicators Г7 № 15, 19.

The research papers in indicator groups Г8 and Г9 represent a continuation of the contributions. The scientific papers submitted for the competition are in topical areas of relevance and importance for science and practice. The candidate uses innovative modern methods and means to solve the problems posed and achieve the set objectives.

The candidate Assoc. Prof. Dr. Stoimenov managed one project at the National Science Fund, and was the supervisor of 2 others, in the submitted reference he was involved in 3

other projects at the National Science Fund, OP-SESG, and NSP. He is a member of the "Union of Automation and Informatics" at the Federation of Scientific and Technical Unions in Bulgaria, and actively participates in a number of scientific forums on the subject of the competition, one of which is in the "Days of Science of TU-Sofia", international scientific and technical conference AUTOMATION OF DISCRETE PRODUCTION, where he was awarded with a silver certificate. He has been awarded with a number of diplomas and certificates, the most significant of which are: a diploma and a commemorative statuette from the EURECA Foundation, "Winner of the EURECA Young Researcher Award for 2019", diplomas in 2018 for "High Scientific Achievements", in 2017 "Great Merits for the Development of the Institute" in which he works - Information and Communication Technologies at BAS.

The candidate supervises two PhD students, one part-time and one full-time.

I believe that in terms of the quality and volume of the results achieved in scientific research and scientific and applied activities, the candidate fully satisfies the requirements for holding the academic position of "Professor", meeting the requirements of the Law on the Development of Academic Staff, the Regulations for its implementation and the Regulations of the IICT-BAS.

4. Scientific research and applied contributions of the candidate

In the works presented by the candidate, there are sufficient contributions in terms of importance and number, which are mainly of a scientific and applied nature, some of which have scientific and applied elements. The topicality and significance of the contributions are confirmed by the fact that the majority of them are in publications with impact factor (3 publications), SJR rank (6 publications), and SJR falling into quartiles (7 publications). The contributions are relevant to the scientific specialty and include:

- Determination of required fill volume for ball mills, development of specialized gripper-dispenser for accurate fill dosing.
- Investigate factors such as fill percentage, shape, RPM, and tribological properties of materials affecting the performance of mills through presented methods and tools involving 3D printed materials to determine the behaviour and motion of variable shaped solids.
- Experimental studies determining mill-operating modes aimed at verification of simulation models with application in industry.
- 3D Simulation modelling, 3D scanning, and 3D printing focused on materials from 3D printers to investigate the motion and interaction of grinding bodies and the environment in which they operate, optimising the dimensions and correct modelling of CAD models and their tribological properties. These studies help to set accurate input data when creating 3D simulations with laboratory and production mills.
- Research and development in the area of tactile suitability of Braille models among a group of blind and visually impaired people.

Contributions can be attributed to the groups of proving with new methods and means essential to already existing scientific fields, theories, hypotheses, and problems, creating new classifications, constructions, and technologies in order to obtain verified results.

5. Significance of contributions to science and practice

I believe that the candidate's contributions to science and practice are relevant and

significant to the development of research in the thematic areas in which he develops and works. I am impressed that the candidate's research and contributions are directed towards solving practical problems in the field. The great social significance of the developments in the field of assisting tactile perceptions of visually impaired and blind people is an indisputable fact.

The presented reference with a total of 59 citations, which exceeds more than 3.5 times the requirements of the Act of the Development of the Academic Personnel of the Republic of Bulgaria, the Rules of the Academic Personnel of the Republic of Bulgaria, the Rules for the conditions and the procedure for acquiring scientific degrees and for the occupation of academic position in the Institute of Information and Communication Technologies, shows without a doubt that the candidate's works have received the necessary renown and recognition by the scientific community worldwide.

6. Critical comments and recommendations

From the works submitted for review for participation in the present competition and my personal impressions of the candidate's scientific research and scientific and applied activities, I believe that he is an erudite, highly qualified, demanding scientist who enjoys deserved authority among specialists at home and abroad. Comments can be made on the contributions, in which some enlargements and refinements could be made.

I have no critical remarks with which to dispute the scientific and applied contributions of the candidate.

I would recommend that in future work, the candidate focus on international project submissions and publication activity with more independent papers.

7. Conclusion

The materials submitted for the competition, and the results described in them satisfy all the requirements of the Act of the Development of the Academic Personnel of the Republic of Bulgaria, the Rules of the Academic Personnel of the Republic of Bulgaria, the Rules for the conditions and the procedure for acquiring scientific degrees and for the occupation of academic position in the Institute of Information and Communication Technologies. My **positive** evaluation of the candidate's overall performance entitles me to **confidently recommend Assoc. Prof. Dr. Nikolay Stoimenov to acquire the academic position "Professor" in the professional field 5.2 Electrical Engineering, Electronics and Automation, specialty "Automated Information Processing and Control Systems"** announced for the needs of the Department "Distributed Information and Control Systems at IICT-BAS.

Date:
25.03.2024 г.

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