REPORT

on a competition for academic position of Associate Professor

in professional field 4.6 Informatics and Computer Science (Software and hardware

implementation of models and algorithms for controlling the movement of manipulators),

for the needs of the Sofia University "St. Kliment Ohridski" (SU),

Faculty of Mathematics and Informatics (FMI),

announced in SG, issue 61/02.08.2022   and on the websites of FMI and SU

The present report has been prepared by: **Prof. Dr. Zlatinka Svetoslavova Kovacheva, Institute of Mathematics and Informatics, Bulgarian Academy of Sciences, professional field 4.6 Informatics and Computer Science,** in my capacity as a member of the scientific jury for the competition, according to Order No. RD / 38-562/28.09.2022 of the Rector of Sofia University.

Only one candidate submitted documents for participation in the announced competition:

Chief Assistant Prof. Kaloyan Marianov Yovchev, Sofia University "St. Kliment Ohridski", Faculty of Mathematics and Informatics

I. General description of the presented materials

1. **Application data**

The documents submitted by the candidate for the competition correspond to the requirements of the Law for the Development of the Academic Staff in Republic of Bulgaria (LDASRB), the Regulations for its Application (RALDASRB) and the Regulations on the terms and conditions for acquiring scientific degrees and occupying academic positions at SU "St. Kliment Ohridski" (RTCASDOAP).

To participate in the competition, the candidate hief assistant prof. Dr. Kaloyan Marianov Yovchev has presented a list of a total of 14 papers in foreign scientific publications and scientific forums, their copies and summaries in Bulgarian and English. The following documents supporting the applicant's achievements are also presented: curriculum vitae, diplomas for higher education and scientific degree "doctor", certificate of work experience as a Chief Assistant Professor, author's reference for scientific contributions, reference for the fulfillment of the minimum national requirements under Art. 2b of LDASRB for scientific field 4. Natural sciences, mathematics and informatics, professional field 4.6. Informatics and Computer Science, a list of participations in conferences and projects, a list of noticed citations, a reference for teaching and classroom employment and a copy of the State Gazette, where the competition was announced.

The diligent, comprehensive and professional layout of the presented materials, which fully satisfy the necessary requirements for participation in the competition, is impressive.

2. Applicant data

The candidate graduated in 2015 from a master's program in Informatics, majoring in "Mechatronics and Robotics" at the Faculty of Mathematics and Informatics of the Sofia University "St. Kliment Ohridski" with full excellent rating. In 2018, he acquired a PhD in Informatics and Computer Science (Information Technologies), again at the Faculty of Mathematics and Informatics of SU "St. Kliment Ohridski" From October 1-st, 2019 until now, he has been working as a Chief Assistant Prof. in the Department of "Mechatronics, Robotics and Mechanics" of the Faculty of Mathematics and Informatics of the University of St. Kliment Ohridski", as well as a specialist in information technology planning at the Institute of Robotics of the Bulgarian Academy of Sciences. He has an excellent command of the English language.

3. General characteristics of the scientific works and achievements of the candidate

The candidate has developed iterative self-learning control methods for robots, a remote control and communication system for service robots, learning mobile service robots, as well as computer simulation of manipulative robots. Regarding the presented scientific works, the following conclusions can be drawn:

a) the scientific works exceed the minimum national requirements (according to Article 2b, Paragraphs 2 and 3 of LDASRB) and, accordingly, the additional requirements of SU "St. Kliment Ohridski" for occupying the academic position of "associate professor" in professional field 4.6. Informatics and Computer Science (Software and hardware implementation of models and algorithms for controlling the movement of manipulators);

b) the scientific works presented by the candidate do not repeat those from previous procedures for acquiring a scientific title and academic position;

c) no plagiarism has been proven in the scientific works presented in the competition according to the law.

4. Characteristics and assessment of the candidate's teaching activity

From the attached Reference on the reported general teaching and classroom employment of Dr. Kaloyan Yovchev at the Faculty of Mathematics and Informatics at Sofia University "Kliment Ohridski" during the last 3 academic years, his active educational and pedagogical activity is visible.

5. Content analysis of the applicant's scientific and applied scientific achievements contained in the materials for participation in the competition

The main scientific contribution of the candidate is the presented new control method with iterative self-learning (Iterative Learning Control, ILC) with constrained output (Constrained Output ILC, COILC). Its convergence is proved.

His scientific and applied contributions include the development of: computer simulation of manipulative robots for experimental verification of proposed control methods with iterative self-learning of robots, an approach for implementing iterative self-learning control in the presence of obstacles in the workspace of manipulative robots, an intelligent remote control and communication system for service robots, hardware and software design for the control of anthropomorphic and robots with additional degrees of freedom, etc.

The applicant's applied contributions include the development of: learning anthropomorphic and cost-oriented mobile service robots, web-based user interface software for the designed robots, MATLAB computer simulation of quadrotor control that allows tracking the deviation from the desired flight path in conditions of turbulence, etc.

Dr. Kaloyan Yovchev submitted for participation in the competition 3 publications with an impact factor in Web of Science, of which 2 in Q3 and 1 in Q4, 9 publications with SJR in Scopus and 2 publications indexed in Scopus and IEEE Xplore.

Fifty two of the candidate's total number of articles were cited, which shows a very good reflection of the obtained results in the works of other authors. For participation in the competition, he submitted 8 citations, which are indexed in Scopus.

The following table presents the total number of points of the candidate and the required minimum number of points for the groups of scientometric indicators, according to Art. 1a (1) and (2) of RALDASRB and the Regulations for the conditions and procedures for acquiring scientific degrees and occupying academic positions at SU "St. Kliment Ohridski"

Summary table for the number of points for area 4. Natural sciences, mathematics and informatics for the academic position "associate professor"

for Chief Assistant Professor Kaloyan Yovchev, Ph.D

Group of indicators	Minimum number of points	Number of points of the applicant
А	50	50
Б	-	-
В	100	156
Г	200	276
Д	50	64
Е	-	-
Total	**400**	**546**

6. Critical remarks and recommendations

I have no critical remarks and questions for the applicant.

7. Personal impressions of the candidate

I do not know the candidate personally.

8. Conclusion on the application

After having familiarized myself with the materials and scientific works presented in the competition and based on the analysis of their significance and the scientific and scientific-applied contributions contained in them, I confirm that the scientific achievements meet the requirements of LDASRB, the Regulations for its application and the relevant Regulations of SU "St. Kliment Ohridski" for the candidate to occupy the academic position of "associate professor" in the scientific area and professional field of the competition. In particular, the candidate satisfies the minimum national requirements in the professional field and no plagiarism has been found in the scientific works submitted for the competition. I give my positive assessment to the application.

II. GENERAL CONCLUSION

Based on the above, I recommend the scientific jury to propose to the competent authority for the selection of the Faculty of Mathematics and Informatics at SU "St. Kliment Ohridski" to select Dr. Kaloyan Marianov Yovchev to occupy the academic position of "associate professor" in professional field 4.6. Informatics and Computer Science (Software and hardware implementation of models and algorithms for controlling the movement of manipulators).

21.11.2022 г.   Prepared the report: ....

(Prof. Dr. Zlatinka Kovacheva)