

STATEMENT

on the materials submitted for participation in the contest for occupation of the academic position "Associate Professor" in the Faculty of Mathematics and Informatics of Sofia University "St. Kliment Ohridski" in Area of Higher Education 4. Natural Sciences, Mathematics and Informatics, Professional Field 4.6 Informatics and computer science (Software and hardware implementation of models and algorithms for manipulator control), announced in State Gazette No 61/02.08.2022.

In the Contest for the academic position "Associate Professor" announced in State Gazette No 61/02.08.2022 and on the web site of Sofia University "St. Kliment Ohridski" (in short, henceforth abbreviated as SU) for the needs of Faculty of Mathematics and Informatics (FMI) participates only one candidate: Assistant Professor Kaloyan Mariyanov Yovchev, Ph.D. – Faculty of Mathematics and Informatics, Sofia University "St. Kliment Ohridski".

Review Author: Professor, Kamen Krastev Delchev, Ph.D. – Faculty of Mathematics and Informatics, Sofia University "St. Kliment Ohridski".

By Order No RD-38-562/28.09.2022 of the Rector of SU I was appointed as a member of the Scientific Jury of the aforementioned Contest. By a decision of this Scientific Jury from 20.05.2022 I was assigned to write a review of the Contest.

I. General description of the procedure and submitted documents

1. General description of the submitted materials

Assistant Professor Kaloyan Mariyanov Yovchev, Ph.D., presented a list of a total of 14 titles for participation in the competition, incl. 14 publications in foreign scientific journals and scientific conferences, of which 2 are related to the candidate's doctoral dissertation, which is why they will not be considered for participation in the competition. There are also 15 other documents (in the form of official notes and certificates from the employer, project manager, funding organization or project assignor, references and feedback, awards and other relevant evidence) supporting the candidate's achievements.

Thus, the accepted set of 12 publications from the list of articles of the candidate submitted for participation in the competition comply with the requirements of the Act on the Development of the Academic Staff in the Republic of Bulgaria (ADASRB), the Rules for Implementation of the ADAS in the Republic of Bulgaria (RI-ADAS in the RB) and the Rules on the Terms and Requirements for Acquisition of Scientific Degrees and Occupation of Academic Positions at Sofia University.

2. Brief biographical data about the candidate.

Assistant Professor Kaloyan Mariyanov Yovchev, Ph.D., graduated successively: "Computer Science" - Bachelor (October 2009 - July 2013), "Mechatronics and Robotics" - Master (October 2013 - April 2015) and PhD in "Informatics and Computer Science" (July 2015 - April 2018) at the Faculty of Mathematics and Informatics in Sofia University "St. Kliment Ohridski".

From 01.10.2019 until now, the candidate holds the position of "Information Technology Planning Specialist" at the Institute of Robotics, Bulgarian Academy of Sciences, and from

01.08.2015 to 30.09.2019 - "Assistant Professor" at the Faculty of Mathematics and Informatics, Sofia University "St. Kliment Ohridski". From 07.07.2017 until now Dr. Kaloyan Mariyanov Yovchev holds the position of "Chief Assistant Professor" at the FMI of Sofia University.

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

The scientific papers accepted for participation in the competition can be referred to the following scientific fields: Iterative Learning Control (2 articles); Robot Control (6 articles); Hardware and Software Design of Robots (2 articles); Application of Service Robots (2 articles).

The scientific works meet the minimum national requirements (under Art. 2b, para. 2 and 3 of ADASRB) and respectively the additional requirements of Sofia University "St. Kliment Ohridski" to hold the academic position of "Associate Professor" in the scientific area and professional field of the competition. They fully cover and exceed the minimum national requirements (for "associate professor"), as for group B.4 the considered articles give 111 points (on demand - 100 points), and for group D.7 - 246 points (on demand - 200 points).

The considered 12 scientific papers submitted by the candidate have not been used to obtain other scientific degrees and academic positions and there is no plagiarism proven in accordance with the law.

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

The assessment of the educational and pedagogical activity of the candidate is definitely positive. According to the submitted report, the candidate has significant teaching activity:

- For the academic year 2019/2020 – classroom employment 270 hours;
- For the academic year 2020/2021 – classroom employment 390 hours;
- For the academic year 2021/2022 – classroom employment 407 hours.

5. Detailed analysis of the scientific and applied achievements of the candidate contained in the materials submitted for participation in the competition

According to the presented reference, the scientific and scientific-applied contributions in the articles considered for the competition are grouped in four groups:

The articles numbered 1 and 2 from the list of articles submitted for participation in the competition were considered for the first group - Iterative Learning Control. The contributions in the articles of the 1st group are scientific and scientific-applied, respectively. The scientific contribution is expressed in the development of a new method for Iterative Learning Control with constraints on output signals, which is a generalization of the Bounded-error Algorithm for Iterative Learning Control. The scientific-applied contribution is expressed in the development of Constrained Output Iterative Learning Control for robots with hard constraints of joint movements (output signals). Hard constrained movements are typical to all industrial robotic manipulators.

The scientometric indicators of the articles in this group are relatively high - IF (1.088 - 2020), Web of Science Quartile: Q3 for article number 1 and Ref Scopus, SJR (0.159 - 2020) for article number 2.

Scientific and applied contributions in articles 7, 9, 11, 13, (list of articles submitted for participation in the competition) and applied contributions in articles 4 and 14 of the 2nd group - robot control are: intelligent remote control and communication system for service robots (Articles 7, 9, 13); an approach by which the gripper of a robotic manipulator can be precisely positioned to a desired object (article 11); a new multi-channel control system for the Robco 19 robot (article 4) and a MATLAB computer simulation of quadcopter control (article 14).

All six articles in this group are with IF/SJR.

The main contributions in the articles numbered 5 and 8 of the third group - hardware and software design of robots, are scientific-applied and are expressed in a cost-effective design of hardware and software for redundant robotic manipulators that perform movements from point to point or trajectory movements.

Both articles in this group are with SJR.

The contributions in the articles numbered 10 and 12 of the fourth group - application of service robots, are applied - the usability of service robots was investigated by performing real experiments and software with a web-based user interface for the designed service robots was implemented.

Both articles in this group are with SJR.

In addition, it should be noted that the candidate Ch. assistant professor Kaloyan Marianov Yovchev, PhD participated as author (in 2 articles), first co-author (in 10 articles) and co-author (in 20 articles) of 32 articles indexed in SCOPUS, which were cited (without self-citations) a total of 50 times in articles indexed in SCOPUS as the candidate has an h-index of 4.

6. Critical remarks and recommendations

The candidate should continue and increase his successful publishing activity.

7. Personal impressions of the candidate

I know the candidate Chief Assistant Professor Dr. Kaloyan Marianov Yovchev since 2013, when he was a student at the Master's program "Mechatronics and Robotics". In addition to being an excellent student, he showed great independence in choosing the topic and developing his Master Thesis, for which I was the supervisor and my participation consisted only in checking and editing the work. Subsequently, together with Prof. E. Krastev, I was also the supervisor of his doctoral studies. He very quickly got into the chosen topic and a year before the PhD thesis defense he published an article in a well-known journal in the relevant scientific field. I would like to point out that in all the articles in which I am a co-author with Dr. Kaloyan Yovchev, he is the first and corresponding author, wrote the articles and carried out their submission and correspondence with the editors. He successfully validated the developed methods on robot models that he personally constructed or participated in their construction. My role was only to discuss the ideas and structure of the articles.

8. Conclusion on the application

The documents submitted for the Contest by Chief Assistant Professor Kaloyan Marianov Yovchev, Ph.D., show that the teaching experience and research competencies of the applicant comply with the requirements of the Act on the Development of the Academic Staff in the Republic of Bulgaria (ADASRB), the Rules for Implementation of the ADAS in the Republic of Bulgaria (RI-ADAS in the RB) and the Rules on the Terms and Requirements for Acquisition of Scientific Degrees and Occupation of Academic Positions at Sofia University for the occupation by the candidate of the academic position “Associate Professor” in Area of Higher Education 4. Natural Sciences, Mathematics and Informatics, Professional Field 4.6 Informatics and computer science (Software and hardware implementation of models and algorithms for manipulator control). I confirm that the scientific achievements meet the minimal national requirements in the Professional Field 4.6 Informatics and computer science and no plagiarism has been detected in the scientific papers submitted for the competition.

II. GENERAL CONCLUSION

Based on the above, **I recommend to the Scientific Jury of the competition to propose to the Faculty Council of the Faculty of Mathematics and Informatics at Sofia University “St. Kliment Ohridski” to elect Chief Assistant Professor Kaloyan Marianov Yovchev, Ph.D., for the academic position “Associate Professor” in Professional Field 4.6 Informatics and computer science (Software and hardware implementation of models and algorithms for manipulator control) to the Department of Mechatronics, Robotics and Mechanics at the Faculty of Mathematics and Informatics at Sofia University “St. Kliment Ohridski”.**

Date: 15.11.2022

Signature:

/Prof. Kamen Krastev Delchev/