

REVIEW

by Prof. Eugenia Kovatcheva, PhD (PF 4.6)

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on the procedure for filling the academic position of "associate professor"

in area 5 Technical Sciences,

Professional field 5.2 Electrical Engineering, Electronics and Automation,

Scientific specialty Application of the principles and methods of cybernetics in various fields of science (Social-assisting robotics with elements of artificial intelligence)

for the needs of the IRSU section

at the Institute of Robotics of the Bulgarian Academy of Sciences

order 130/07.10.2025 of the Director of the Institute of Robotics

In the competition for the academic position of ASSOCIATE PROFESSOR in 5.2 Electrical Engineering, Electronics and Automation, scientific specialty Application of the principles and methods of cybernetics in various fields of science for the needs of the IRSU section at the Institute of Robotics of the Bulgarian Academy of Sciences, announced in the State Gazette issue 66 of 12.08.2025, only one candidate, Ch. Assistant Professor Dr. Paulina Tsvetanova Tsvetkova.

Candidate Senior Assistant Professor Dr. Paulina Tsvetanova Tsvetkova.

1. General description of the submitted materials

The topic Social-Assisting Robotics with Elements of Artificial Intelligence, with which the candidate is applying, is of utmost importance nowadays. Supporting children with special educational needs is an important aspect for their socialization. The relevance is also evident from the number of citations of the articles selected by Eng. Petkova for 5 articles 21 citations for the last 5 years.

2. Application data

The documents submitted by the candidate for the competition comply with the requirements of ZRASRB, PPZRASRB and REGULATIONS on the conditions and

procedure for holding academic positions at the Technical University - Sofia (PURZADTUS).

For participation in the competition, the candidate Dr. Paulina Tsvetkova has submitted a list of a total of 41 titles published in foreign scientific publications and scientific forums. For each indicator, documents (in the form of an abstract, diplomas, references, bibliographic references, official notes) supporting the candidate's achievements are presented.

When considering the Minimum National Requirements presented by the candidate Dr. Tsvetkova according to the Regulations for the Implementation of the Law on the Development of the Academic Staff of the Bulgarian Academy of Sciences and Arts for the Occupation of the Academic Position of Associate Professor in Area 5 Technical Sciences, Professional Direction 5.2 Electrical Engineering, Electronics and Automation, she covers the requirements A, C and D exactly, and for D - exceeds them by more than two times.

The candidate has presented the full text of the publications and a bibliographic reference for indicators C, D. It is necessary to have a link to the citations in the referenced databases for faster verification.

There is no reference to which publications the ONS doctor was acquired. There is no complete list of the candidate's articles and those clearly marked for the acquisition of the ONS doctor.

3. Minimum requirements

Indicator A

In 2022, a dissertation was defended for the award of the ONS Doctor - 50 points (minimum 50) according to the reference in NACID (this information is missing in the submitted documents).

Indicator B

Habilitation work - scientific publications in refereed journals on the topic: Social-assistive robotics with elements of artificial intelligence. Most of the submitted articles (4-10) are on the topic, and the rest develop it (articles 1-3), for which 101 points (minimum 100) are received. Of the 10 submitted publications, she is the first author in only two. The topic is interdisciplinary and it is logical that the scientific publications have a large team.

Indicator D

7. Scientific publication in publications that are referenced and indexed in world-renowned databases of scientific information – 85.01 points

8. Scientific publication in non-refereed journals with scientific review or in edited collective volumes – 115.72 points

The candidate has submitted 21 articles in indicator D8, but I accept only 16 of them, because two of the articles are identical and have the same title, but in different languages:

- articles 14, 17, 18 and 20 are presented with one title in English, Italian, Portuguese and Turkish,
- articles 15, 16, 17 are in English, Italian and Portuguese.

Overall, this indicator scores 200.73 points out of a minimum of 200.

Indicator E

12. Citations or reviews in scientific publications, referenced and indexed in world-renowned databases of scientific information or in monographs and collective volumes – 120 points out of a minimum of 50.

The 5 articles submitted have a total of 12 citations in Scopus (the candidate failed to note this as well as the number of points).

4. Candidate details

The development of candidate Paulina Tsvetkova is interdisciplinary and goes through a bachelor's and doctorate in psychology, a master's degree in English language and methodology, a course in Artificial Intelligence and as described in the CV, she is currently pursuing a master's degree in artificial intelligence

2025 -2027 Master's degree in Artificial Intelligence - BFU, Burgas

2023 Course in Artificial Intelligence - SoftUni, Sofia

2019 - 2022 - Doctor of Psychology

2012 -2014 - Master's degree in English language and methodology - PU "Paisiy Hilendarski", Plovdiv

2008 -2012 - Bachelor's degree in Psychology - PU "Paisiy Hilendarski", Plovdiv

And since November 2020 she has been working at the Institute of Robotics of the Bulgarian Academy of Sciences after 10 years of experience in school.

Over the past five years she has participated in 4 projects, two of which are European under COST, and she is the leader of one of them at the Scientific Research Fund for Young Scientists and Postdoctoral Fellows in 2023 on the topic "Revival of the Suggestopedia method through new neuropsychological knowledge to help teachers".

5. General characteristics of the candidate's achievements and scientific works

The candidate has presented 5 scientific contributions and 5 applied ones. It is evident that she does not know what applied contributions mean. Participation in scientific research, in symposia and work on projects are not included in this number. I do not accept the distribution.

I would suggest:

Scientific

- Development of a modular software architecture for integrating conversational AI into social assistive robots (SAR), including NAO, Pepper and Furhat – demonstrated modularity and adaptability to various cloud NLP services – indicator B [4]
- Expanding the capabilities of the humanoid robot NAO by implementing conversational AI for more natural communication and therapy of children with speech and language disorders – indicator B [6]
- Comparison of different machine learning classifiers for predictive results in data processing – indicator D [2]
- Gaps in accessibility, awareness, training using the Delphi method have been identified regarding the needs and future priorities for social inclusion of people with intellectual disabilities and autism through assistive technologies.
- Strategies for overcoming barriers have been developed – emphasis on accessibility, personalization and changes in technological paradigms – indicator B [9].

- Awareness and provision of valuable guidance on the expectations of various stakeholders – representatives of disability organizations, academia and the practical sphere – was analyzed. Valuable information was offered on emerging trends in assistive technologies powered by artificial intelligence – indicator D [9].

Scientific and applied

- Enrichment of educational programs with interdisciplinary elements and practical skills in image processing – indicator B [8]; indicator D – [1], [8] -Integration of image processing with Python in training through a real case – working with ancient manuscripts (palimpsests), including techniques such as CLAHE, Gamma correction and Gaussian smoothing.
- Optimization has been developed by tuning hyperparameters (GridSearchCV, RandomizedSearchCV) – indicator D [2]
- A methodology has been developed for fatigue analysis in suggestopedia teachers using EEG and psychological questionnaires – a contribution to the study of the cognitive and emotional state of suggestopedia teachers – indicator D [3].
- A new software framework for psychological screening has been developed using the social robot Furhat for automation, adaptation of tests and reduction of barriers for implementation by psychologists – indicator D [4].

6. Notes and recommendations

There is a discrepancy between the number of articles submitted and those in the candidate's biography (only 15, and for participation in the competition there are 41). In some of the articles submitted for the competition it is noted that she is an Associate prof. (for example, publications in non-refereed publications under number 6, 8, 9 and 11)

The bibliographic reference is not accurate in places - for example, article 6 of G8 is missing authors:

6. The role of Generation Z values in building an authentic employer brand: between innovation, sustainability and digital culture 1 - Collection of reports "APPLIED PSYCHOLOGY AND SOCIAL PRACTICE". Summer Scientific Session of the Faculty of Social, Economic and Computer Sciences XXIV International Scientific Conference

"Applied Psychology and Social Practice" Varna, 2025, University Publishing House 2025, pp. 40-47, ISSN 1314-8397 – 6.6 t.

Or presentation of citations D12 with an incomplete list of authors

Irfan, B., Kuoppamäki, S., Hosseini, A. et al. Between reality and delusion: challenges of applying large language models to companion robots for open-domain dialogues with older adults. Auton Robot 49, 9 (2025). <https://doi.org/10.1007/s10514-025-10190-y>

7. Personal impressions of the candidate

I know Dr. Tsvetkova vaguely. Based on the artifacts specified in the competition, I am familiar with her research work.

8. Conclusion on the application

After having familiarized myself with the materials and scientific papers presented in the competition and based on the analysis of their significance and the scientific and scientific-applied contributions contained therein, I confirm that the scientific achievements meet the requirements of the ZRASRB and PPZRASRB for the candidate to occupy the academic position of DOCTOR in the scientific field and professional direction of the competition. In particular, the candidate meets the minimum national requirements in the professional direction and no plagiarism has been established in the scientific papers presented in the competition.

I give my positive assessment of the application.

General Conclusion

Based on the above, I recommend that the scientific jury propose to the competent body for the selection of the Institute of Robotics of the Bulgarian Academy of Sciences to elect a Chief Assistant. Dr. Paulina Tsvetanova Tsvetkova to take up the academic position of ASSOCIATES in Professional Field 5.2 Electrical Engineering, Electronics and Automation, Scientific Speciality Application of the Principles and Methods of Cybernetics in Various Fields of Science (Social-Assisting Robotics with Elements of Artificial Intelligence) for the needs of the IRSU Section at the Institute of Robotics of the Bulgarian Academy of Sciences.

Prepared by:

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