STATEMENT

on the procedure for occupation of the academic position **"Professor"**

Professional Field: 4.6. Informatics and Computer Science,
Scientific Specialty: Informatics
Published in SG : No. 49 from 21.06.2019 for the needs of the department
„Mathematical Methods for Sensor Information Processing "
in Institute of Information and Communication Technologies
Bulgarian Academy of Sciences

Candidate: **Assoc. Prof. Petya Koprinkova, PhD**

Member of the Scientific Jury: **Prof. Michail Petrov, PhD**
Technical University Sofia, Plovdiv branch

1. Overall characterization of the provided materials.

According to art. 9. (1) of the Rules for specific conditions in gaining scientific degrees and for academic positions of IICT-BAS, the candidate in the procedure for gaining academic position "Professor" - Assoc. Prof. Petya Koprinkova has been presented all neccessary documents: CV in EU standart, PhD diplom copy, associate professor's certificate; work experience documentation; list of scientific publications, list of evidence of scientific and applied results; list with citations, abstracts of application publications on English and Bulgarian; copies of the publications; reference for the fulfillment of the minimum national requirements under Art. 2b, para. 2 and 3 and the requirements of the IICT under Art. 2b, para. 5, drawn up on the basis of documents submitted for the competition; reference to original scientific and scientifically-applied contributions; declaration that they have not been proven by law to plagiarize scientific works.

The refference of requirements for gaining academic degree "Professor" in IICT-BAS show that all requirements in the specific groups are overfilled: group A - 50 points; group B -302 points; group C - 606 points; group D - 792 points and group E - 422 points.

The analysis of the provided materials shows, that all state requirements and the Rules for specific conditions in gaining scientific degrees and for academic positions of IICT-BAS are fullfiled.

2. Evaluation of the scientific works of the candidate.

Assoc. Prof. Petya Koprinkova participate in the procedure with 46 scientific publications, outside other procedures. Out of them, 15 publications were selected for a habilitation work. Most of her works are published in famous international organisations – IEEE, Lecture Notes in Computer Science, INISTA etc. It should be noted that all publications are submitted and referred in Scopus and Web of Science database.

The submitted publications for the procedure are in actual areas — information technology, artificial intelligence systems, heuristic dynamic programming using neural networks, neural-fuzzy approaches, fuzzy sets, genetic algorithms etc. For solving the problems and tasks in these areas, the candidate uses modern methods and approaches. The achieved results undoubtely show, that assoc. prof. Koprinkova has a high profesional qualification, deep knowledge and experience in the field of artificial intelligence and information technologies.

3. Scientific and applied contributions of the publications.

Candidate's works have many important scientific and applied contributions. They relate to the scientific specialty of the procedure and include developing and research of approaches and algorithms of artificial intelligence systems, heuristic dynamic programming using neural networks, neural-fuzzy approaches, fuzzy sets, genetic algorithms etc.

In general, the contributions to the habilitation work set could be summarized in the following main groups:

The contributions presented in the publications in this group are in the field of heuristic dynamic programming using neural networks, in particular the so-called Adaptive Critic Design (ACD) using a special, new type of recurrent neural networks, called Echo State Networks (ESN) and called the “echo” state as well.

In general, the contributions to the other works outside the habilitation work set can be summarized in the following groups:

Creating Spike Timing Neural (STN) models to simulate human eye movements;
Neural networks and neural-fuzzy approaches and their applications;
Fuzzy set theory and its applications;
Genetic algorithms and their applications;
Modeling of biotechnological processes.

4. The importance of the contributions to science and practice.

The major part of the scientific and applied research, which is reflected in the publications, is initiated by practical needs and is directly aimed at control of technological processes in plants of biotechnological systems. The selection of publications grouped as a habilitation set is a comprehensive study that has developed a complete approach for heuristic dynamic programming using neural networks.

All citations of the candidate's works - 132 issues, presented in the reference, are in the works of foreign authors in prestigious publications. Many of them are indexed and referenced in the Scopus scientific database. Therefore, associate professor Koprinkova is well known among the international scientific community and her developments provoke interest and recognition among the researchers in the field of artificial intelligence and informatics.

It should be noted that the quantitative and qualitative indicators of the criteria for occupying the academic position of "professor" are fulfilled by the candidate.

In general, with her scientific works and contributions, the candidate has a great authority among the scientific community at home and abroad.

5. General characteristics of the activity of candidate

The candidate Assoc. Prof. Koprinkova has a total work experience of 30 years, 16 of which as an associate professor. During this period, she worked as a specialist and research associate at the Institute of Control and Systems Research - BAS, associate professor at the Institute of Systems Engineering and Robotics - BAS and associate professor at the Institute of Information and Communication Technologies. Assoc. prof. Koprinkova has been working on a number of national and international projects funded by various organizations. She has been the deputy head of one and the head of two national projects funded by the NSF. She has supervised three bilateral international cooperation projects. She is member of the Executive Committee of the European Neural Network Society, member of the IFAC Technical Committee and member of the editorial boards of 3 journals.

All developments are from the nomenclature scientific specialty of the announced competition. She has teaching experience with the students of the Faculty of Electronics and Automation at the Technical University - Sofia. Assoc. Prof. Koprinkova is a co-author of an university textbook. Candidate's pedagogical work and abilities to teach are appropriate for the desired scientific degree.

I think, that the volume and the quality of the candidate's scientific, scientifically-applied, pedagogical activity aligns with the state requirements for this procedure.

6. Comments, recommendations and remarks.

I have no significant critical comments on the publications submitted.

The suggested reference for the contributions to the works of Assoc. Prof. Koprinkova is somewhat extensive. Closer systematization and generalization is possible. In this case, this is a natural result, given the diversity of subject matter in the applicant's scientific publications and the development team. This note is essentially recommendatory and do not detract from the results achieved by the applicant in the scientific and applied activities.

CONCLUSION

Based on the procedure materials, the actuality and the importance of the gained scientific and scientifically-applied contributions and the positive evaluation of the candidate's overall activity, I find appropriate to propose to the honorable Scientific Jury to vote a proposal to the Scientific Council of the IICT-BAS, Assoc.Prof. Petya Koprinkova to gain academic position "Professor" in the professional field: 4.6. Informatics and Computer Science, (scientific specialty "Informatics").

Date,
14.10.2019

SCIENTIFIC JURY MEMBER:

/Prof. Dr. Michail Petrov/