

## **Opinion**

**For the competition for occupation of the academic position „Associate professor”  
Higher education area 4. Natural sciences, mathematics and informatics, professional  
field: 4.6 Informatics and Computer Science, specialty: Informatics (Human Computer  
Interaction), declared in the State Gazette No 52/02.07.2019, for the needs of IMI-BAS,  
department of Mathematical Foundations of Informatics  
candidate: Dr. Todorka Gerasimova Alexandrova**

**Member of the scientific Jury: Prof. Dr. Krassen Stefanov Stefanov,  
Sofia University „St. Kl. Ohridski” - FMI**

I am presenting this opinion as a member of the Scientific Jury in the above mentioned competition, on the base of order No 322 from 02.09.2019 of the Director of IMI - BAS, as well as on the ground of Decision of the Scientific Jury (Protocol 1 from 12.09.2019). This opinion fully corresponds to the ZRASRB, Statute of MC for the application of ZRASRB, Statute for the development of the academic staff of BAS.

### **1. General description of presented materials**

I received the following documents as a member of the scientific jury: CV, two copies of different PhD Diplomas, certificate for the length of service, list with scientific publications for participation in the competition, list of all scientific publications, list with citations, resumes of the publications – in Bulgarian and in English language, copies of the 22 publications presented for the participation in the competition, checklist for the fulfilment of the national minimal requirements to become Associate professor, reference for the original scientific results and achievements, declaration for lecture activities, and various declarations for the fulfilment of the requirements.

The candidate fulfils all the requirements stated in the ZRASRB, Statute of its implementation and statutes of BAS. In particular:

1. She achieved the PhD
2. She holds a position of Associate Professor and relevant academic positions in other universities for more than two years
3. She presented 22 scientific publications in specialized scientific issues, different from these for achieving PhD rank, and valued with the needed points according to requirements and minimal national standards for becoming a professor.

The publications presented for the competition fully correspond to the thematic of the competition.

There is no plagiarism detected in relation to the scientific publications of the candidate.

### **2. A general characteristics of the candidate’s research, education and application activities**

The whole number of the publications of dr. Todorka Gerasimova Alexandrova is 51. She presented 22 from them for the participation in this competition. Three publications are in international journals with Impact Factor, five are in the magazines with SJR, 12 are in the proceedings of conferences indexed in Scopus/WoS, and two are in the proceedings of conferences indexed in ACM.

All publications have three or four co-authors. In 1 publication the candidate is the first author.

I can conclude that quantity and quality of presented scientific publications is enough to satisfy all of the stated requirements.

Dr. Todorka Gerasimova Alexandrova has long and successful career as a university lecturer, mainly at Wasada University in Japan. She also has participated as a research and scientific mentor of five successful MSc students. She received several awards for her scientific career including three awards for best papers presented at scientific conferences.

The candidate is presenting a list with 20 Scopus citations of her publications presented for the competition. All her citations are 168 overall, which proves the high visibility of the candidate's scientific publications through scientific community.

Dr. Todorka Gerasimova Alexandrova was leader of one research projects in Wasada University in Japan.

### **3. Analysis of the scientific and applied research results of the candidate**

The main scientific results of Dr. Todorka Gerasimova Alexandrova in the publications, presented for the competition, can be divided into three general research domains:

#### **Higher well-being through virtual reality (publications for the competition 1-4, 7-9, 11-15, 17)**

The human well-being includes five main features: positive emotions, engagement, mutual relations, meaning and achievements. The main direction of research in papers presented for the competition is related to raising human well-being through proper support for human emotions and behaviour. For this specific goal, the candidate has chosen the virtual reality models and technologies, and specifically their application in virtual characters, virtual forums, games and other forms of gamification.

The candidate presents two specific examples how these models and ideas can be realized in real life. The first use case is the extended computer game Augmented Trading Card Game, and the second one is the software platform for mobile crowd sourcing called Micro-Crowdfunding, aiming to motivate people to participate in the achievement of sustainable society, contributing to the social goods sustainable development.

#### **Knowledge searching and sharing through Crowd sourcing (publications 5-6, 16, 18-20)**

The candidate is performing research on how existing social platforms and media can be used to find volunteers to participate in creating, searching and sharing knowledge on demand in real time. One of the key findings is related to the new method how to extract context information from physical reality. She proposed a novel approach to use existing users of social networks and media as sensors (Human as Sensors) for extracting all the relevant information, which is sensitive to place and time, using mobile devices. The software systems, developed to apply such an approach, can extract information, which will be difficult (if possible at all) to be received from hardware sensors. This enables the ability to develop complex and more reliable contextual models of reality.

#### **Secret images sharing schemes (publications 10, 21-22)**

The publications in this group deal with application of secret images sharing schemes and are a natural continuation of her research from her PhD thesis, where she presents theoretical limits for different secret sharing schemes. This area of research has significant applications in various domains related to information security and computer networks. The proposed method can be simply explained as dividing a secret information in  $n$  parts, named secret

parts, and distributing these parts between different users in such a way, that only selected qualified sub-set of user can assemble the whole secret message using their own parts.

The candidate proposed different applications of this general approach in solving anonymity problem in Peer-to-Peer (P2P) networks in her publications 21 and 22.

#### **4. Influence of the publications of the candidate to the research community**

The overall number of the citations in Scopus of the research publications of the candidate is 168, while the number of citations of papers presented for the competition is 20.

I can conclude that the number of citation of research publications selected for the participation in the competition satisfies all the requirements for the position of Associate Professor.

#### **5. Critical remarks and recommendations**

I don't have any critical remarks.

I can recommend to the candidate to increase her efforts in participating in research projects and teaching and working with students in Bulgaria, and to take special attention to work with PhD candidates.

#### **6. Conclusion**

On the ground of all above mentioned facts and conclusions, and taking into account the standards expressed in the laws and statutes, I give positive vote for all presented materials from Dr. Todorka Gerasimova Alexandrova. As the candidate fully satisfy all requirements of ZRASRB and the rest of normative documents, standards and statutes enumerated above, and even exceed most of the quantitative indicators, this gives me the conviction to state, that Dr. Todorka Gerasimova Alexandrova is fully suited to take the position Associate Professor. So, I propose to the Honorable Members of the Scientific Jury to vote for the assignment of Dr. Todorka Gerasimova Alexandrova to the academic position of Associate Professor in the higher education area 4. Natural sciences, mathematics and informatics, professional field: 4.6 Informatics and Computer Science, specialty: Informatics (Human Computer Interaction e).

Date: 29.10.2019

Member of scientific Jury:

/Prof. Dr. Krassen Stefanov/