R E V I E W   R E P O R T

**on Scientific Work for Participation in the Competition
for the Academic Position of 'Associate Professor'
in 5. 'Technical Science' Higher Education Area,
5.3 'Communication and Computer Equipment' Professional Orientation
(Automated Systems for Management and Information Processing),
Published in State Gazette Issue 87 of 09/10/2020
and on 'Konstantin Preslavsky' University of Shumen's Website
for the needs of the Department of Communication and Computer
Technologies, Faculty of Technical Sciences,
with candidate Chief Asst. Professor Valentin Tonev Atanasov, PhD**

**Scientific Jury Member: Prof. Mihail Petkov Iliev D.Eng.Sc,
'Angel Kanchev' University of Ruse**

Chief Asst. Prof. Valentin Atanasov, PhD from 'Konstantin Preslavsky' University of Shumen is the only candidate who has submitted documents for participation in the present competition.

1. Biographical Information

Chief Asst. Prof. Valentin Tonev Atanasov, PhD was born in 1964 in Kaspichan, Shumen District. He graduated 'G. Dimitrov' National Military Artillery School in 1986 ('Artillery, AD and CIS' Faculty at 'Vasil Levski' National Military University at present) with 'Computer Engineer' civilian qualification. In 2017 he defended doctoral thesis and acquired doctoral degree in 5. Technical Sciences higher education area, 5.3 'Communication and Computer Equipment' professional orientation (Automation of Areas in the Intangible Field) at 'Angel Kanchev' University of Ruse.

Valentin Atanasov has extensive experience in the public administration domain where he has built his administrative, organizational and research capacity. The candidate has been employed as a Chief Asst. Prof. with the Department of Communication and Computer Technologies, Faculty of Technical Sciences at 'Konstantin Preslavsky' University of Shumen since 01/12/2017. He has been a Chief Assistant Professor with the Department of Computer Systems and Technology, Faculty of Artillery, Air Defense and CIS at 'Vasil Levski' National Military University since 04/06/2018. Valentin Atanasov lectures, conducts research and undertakes academic work at both universities.

The candidate meets the requirements outlined in Art. 24, Para. 1 and 2 of the Act on Academic Staff Development in the Republic of Bulgaria (AASDRB).

2. Description of the Submitted Materials

The candidate eng. Valentin Tonev Atanasov, PhD participates in the competition with 25 scientific publications. All documents needed for the objective assessment of the academic teaching, scientific research and development activities of the candidate have been submitted as per the requirements of AASDRB.

It is deemed that the submitted 25 scientific publications are in the field of the present competition and I have accepted all of these for review. The scientific work within the competition could be categorized as follows:

Monographs -	1 pcs. (№ 16)
Collective monographs -	1 pcs. (№ 12)
Scientific publications -	14 pcs., inclusive of:
in Bulgarian -	9 pcs. (№ 1, 4, 5, 8, 9, 10, 13, 14, 15)[*]
in English -	5 pcs. (№ 2, 3, 6, 7, 11)
articles -	3 pcs. (№ 7, 8, 11)
conference papers -	11 pcs., inclusive of:
national -	9 pcs. (№ 1, 4, 5, 6, 9, 10, 11, 13, 14)
international -	2 pcs. (№ 2, 3)

Categorization of the publications in terms of the number of authors:	
single-authored -	6 pcs. (№ 1, 4, 5, 7, 8, 10)
collaborative -	8 pcs. (№ 2, 3, 6, 9, 11, 13, 14, 15)
Textbooks and study guides -	7 pcs.
Applied research projects -	2 pcs.

3. Impact of the Candidate`s Publications on Scientific Literature

The author's citation report submitted with the materials for the competition lists 18 citations of the candidate's publications, 3 of which are in editions referenced and indexed by internationally acclaimed scientific databases.

4. General Characteristics of the Candidate's Activity

4.1. Educational and Pedagogical Activity

Valentin Atanasov PhD has been working as a Chief Assistant Professor with the Department of Communication and Computer Technologies, Faculty of Technical Sciences at 'Konstantin Preslavsky' University of Shumen since 01/12/2017 and with the Department of Computer Systems and Technology, Faculty of Artillery, Air Defense and CIS at 'Vasil Levski' National Military University since 04/06/2018. He has delivered courses and lectures in various academic subjects: Computer Networks, Microprocessor Technology, Network Administration, Multimedia Design and Development, Analysis and Synthesis of Communication and Information Systems, Computer Architecture and Computer

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[*] The numbering of the listed scientific publications follows the one introduced in the ‚Publications List' document

Organization, Computer Peripherals, Web Design and Coding - Part 1, Specialized Computer Systems. The candidate has participated in curricula development activities, has supervised graduates in the preparation and defence of their research/ theses and has taken part in commissions for theses defence.

It can be concluded that the teaching work and pedagogical activities of Valentin Atanasov PhD are diverse and meaningful.

4.2 Scientific and Applied Research Activity

Chief Asst. Prof. Valentin Atanasov PhD participates in the competition for the 'Associate Professor' position with 2 monographs (1 single-authored and 1 produced in collaboration), 14 scientific publications, 7 textbooks and study guides in the scientific field of the competition. He has participated in 3 internal university projects (with the 'Artillery, AD and CIS' Faculty of "Vasil Levski" National Military University), as follows:

- Interface research of a smart system for ubiquitous computing ('Smart Home' mobile technology system) Stage 1 – 'Design, Construction and Implementation of a Prototype';
- 'Interactive web-based application for training in 9M111 and 9M113 system design and functioning';
- 'Design and development of the new website of 'Vasil Levsky' National Military University'.

The implementation of the above 'Smart home' mobile technology system project resulted in the development of innovative learning lab facilities.

4.3. Development Activity

Valentin Atanasov's scientific research focuses on development and implementation of new forms of learning applications that are clearly in line with the academic subjects that the candidate teaches. His scientific and applied research in the field of programming model synthesis serves as a basis for learning applications software development in the computer architecture domain. The candidate collaborates with a research team and has developed a small application connected to his research and complementing the educational activity in this direction.

Valentin Atanasov PhD has created a prototype of a smart mobile high-tech learning system with wireless voice-controlled components and IoT category which has been implemented by means of a methodology for practical learning and scientific research work.

5. Contributions (Scientific, Applied Research and Practical)

Having analyzed the materials submitted for review I would summarize Valentin Atanasov's contributions across areas of study and categorize these as follows:
- Synthesis of learning software systems;
- Synthesis of algorithms;
- Conceptualization and synthesis of intelligent educational structures;

- Conceptualization of the engineering educational process;
- Study of interfaces in an intelligent system for ubiquitous computing;
- Processes formalization.

5.1. Contributions in the Monograph Titled '*Interactivity in Web-Based Learning Applications*'

- A framework for measuring and evaluating educational interactivity has been synthesized;
- A methodology for measuring and evaluating educational interactivity is proposed;
- Criteria for measuring and evaluating educational interactivity are defined;
- A taxonomy of interactivity evaluation has been synthesized;
- A namespace and specifications of educational interactivity are defined;
- A classification of interactive objects for measuring and evaluating interactivity is proposed;
- An algorithm for determining the complex index of educational interactivity has been synthesized;
- A didactic model of ICT-based educational process has been synthesized;
- A model of educational interaction has been synthesized;
- Conceptualization of educational interactivity is made;
- A classification of educational interactivity is proposed;
- A conceptual model of a web-based learning application prototype has been synthesized;
- A functional model of a web-based learning application prototype has been synthesized;
- A prototype architecture of a web-based learning application has been synthesized;
- A methodology for design and development of a web-based learning application is proposed;
- A workflow of a learning application has been developed.

5.2. Contributions in the Synthesis of Learning Software Systems

- A framework for measuring interactivity in digital educational resources has been synthesized [2];
- A model of user interaction has been formalized based on the author's theoretical work that has been published [1, 2];
- A classification of interactive objects for measuring and evaluating interactivity in web-based learning applications is made [5];
- A programme mechanism for evaluating the interactivity of web-based learning applications has been proposed [5];
- A namespace for determination of the complex index of educational interactivity in web-based learning applications is defined [5];
- An interface and an abstract class of user programming interaction have been synthesized [6];

- A functional model of a game-based learning application has been synthesized [1, 8];
- A functional model of a smart educational cluster has been synthesized [10];
- A learner model in a web-based platform for learning games has been synthesized [11];
- A model of a CISC processor has been synthesized and a process model for simulation has been developed [13].

5.3. Contributions in the Algorithm Synthesis

- An algorithm for determining a complex index of educational interactivity in web-based learning applications has been synthesized [5];
- An update of the IEEE 1484.12.1-2002 Learning Object Metadata Standard is proposed in the section outlining the interactivity [8];
- An algorithm of a game-based process for testing knowledge has been developed [8].

5.4. Contributions in the Conceptualization and Synthesis of Intelligent Educational Structures

- User interactions are conceptualized in a learning application [2];
- A comprehensive educational paradigm is proposed applicable to a digital learning process [7];
- A conceptual model of an intelligent educational structure is proposed [7];
- A model of a smart educational cluster has been conceptualized [10];
- The 'Flow state' in a computer learning game has been conceptualized [11].

5.5. Contributions in the Conceptualization of the Engineering Educational Process

- Conceptualization for development of web-based learning applications is presented [6].

5.6. Contributions in the Interface Research in an Intelligent System for Ubiquitous Computing

- A conceptual model has been synthesized as part of the physical realization of the 'Smart home' high-tech system - with wireless controllers and human-computer interface integrating a set of voice commands [9];
- A full-featured model of a 'Smart home' high-tech system was built and physically implemented [9].

Upon a complex assessment I would define the applicant's contributions as applied research and practical and would evaluate these as enhancing existing knowledge and technical systems, formulation of new classifications, methods and algorithms, obtaining and proving supporting facts.

6. Evaluation of the Candidate's Personal Contribution

The candidate participates in the present competition with 25 scientific publications, including 2 monographs (1 of which single-authored), 14 articles, 7 textbooks and study guides and 2 applied research projects. 6 of the publications are single-authored, 7 are produced in collaboration with another co-author and 1 with two co-authors. Valentin Atanasov PhD is the lead author in 4 of the collaborative publications. No appendix has been presented for assignment of authorship in the collaborative work and I have therefore assumed equal authorship for all contributors listed. In consideration of the above and having analyzed the scientific publications submitted for review, I have no doubt in the authorship of the contributions of Ch. Assist. Prof. Valentin Tonev Atanasov PhD outlined in point 5 of the present review report. I have not established any proof of plagiarism in the submitted publications.

7. Critical Remarks

Based on the analysis of the work submitted for review within the present competition, I would make the following remarks and recommendations to the prospective work of Valentin Tonev Atanasov PhD:

1. The number of the candidate's scientific publications for participation in this contest is rather small;

2. The number of the candidate's publications in significant scientific editions and events is relatively small;

3. It is recommended that the candidate intensify his work with local and international students, PhD students, and young scientists in order to build a team with the capacity to obtain more meaningful results and to participate in national and international research projects and programmes.

8. Personal Impressions

I have not met the candidate and I have not worked with him but I have worked with his colleagues who have provided positive feedback about him, his teaching and research work. Based on my communication with Valentin Atanasov PhD during the preparation of the present review report, I came under the impression that he is a very well-organized and diligent young person. Based on this, on the compliance of the materials for participation in the competition with the minimum scientometric requirements outlined in the Act on Academic Staff Development in the Republic of Bulgaria, as well as on the opinion of Dr. Atanasov's colleagues at the University of Shumen, I can reasonably conclude that I have formed an adequate and objective opinion about the candidate and his overall work.

It is deemed that the quality of the scientific work and the professional realization of Valentin Tonev Atanasov PhD are in line with the requirements of the Act on Academic Staff Development in the Republic of Bulgaria, its Implementing Regulations and the requirements of 'Konstantin Preslavsky' University of Shumen for taking the academic position of 'Associate Professor'.

9. Conclusion

The materials submitted for review within the present competition are sufficient in terms of quality. The scientific work is compliant with the requirements of the Act on Academic Staff Development in the Republic of Bulgaria and with the minimum scientometric requirements for 'Associate Professor' academic position in 5.3. 'Communication and Computer Equipment' professional orientation. The analysis of the scientific production for participation in the competition indicates that Chief Asst Prof. Valentin Tonev Atanasov, PhD has carried out sufficient and significant research, teaching work and pedagogical activities. He published monographs, articles and papers. The candidate's scientific work has the necessary applied research and practical contributions.

In view of the above, I propose that the Faculty Council of the Faculty of Technical Sciences at 'Konstantin Preslavsky' University of Shumen select Chief Asst. Prof. Valentin Tonev Atanasov PhD for the academic position of 'Associate Professor' in 5. 'Technical Science' higher education field, 5.3 'Communication and Computer Equipment' professional orientation (Automated Systems for Management and Information Processing).

Jan 4th 2021   **Scientific Jury Member:**..................

/Prof. Mihail Iliev D. Eng.Sc/