Appendix 12d

REPORT

to occupy the academic position:

"Professor"	X
"Associate Professor"	
	one of the academic positions indicated shall be marked with the sign "X"

Candidates to occupy the position:

1	Associated Professor	Dr. Eng.	Atanas	Velkov	Atanassov	UCTM
№	academic position	scientific degree	name	middle name	last name	workplace

Scientific area:

5	Technical Sciences
code	name

Professional area:

5.2	Electrical engineering, electronics and automation
code	name

Scientific specialty:

Automated systems for information processing and control

The competition has been announced:

108	22.12.2020	Informatics	Faculty of Chemical and System Engineering
in SG issue	date	for the needs of the Department	Faculty

The report was written by:

Prof.	Dr. Eng.	Elena	Georgieva	Koleva	UCTM
academic position	scientific degree	name	middle name	last name	workplace

1. Report for the candidate:

Associated Professor	Dr. Eng.	Atanas	Velkov	Atanassov
academic position	scientific degree	name	middle name	last name

1.1. Meeting the minimum requirements under the Regulations:

A) The candidate meets the minimum requirements	20 points	X
B) The candidate doesn't meet the minimum requirements	0 points	
		one of the answers given is marked with the sign "X"

It must be filled in if answer B is marked. The publication activity of the candidate is analyzed. The response of the results achieved (quoted) is analyzed.
The scientific-metric data of Assoc. Prof. Dr. Eng. Atanas Atanassov exceed the minimum national requirements for the academic position of "professor" in the scientific area 5 Technical sciences, professional area 5.2 Electrical engineering, electronics and automation according to the Law for development of the academic staff in the Republic of Bulgaria, the Regulations for its implementation and the Regulations for giving scientific degrees and occupation of academic positions at UCTM. The total number of points of the candidate is: 1509 with a minimum of 600 points required per group of indicators for the academic position "professor" in the field of Technical Sciences. A total of 64 scientific papers were presented for the competition: • 11 scientific publications (habilitation work), indexed in Scopus and / or in WoS, two of them with SJR (380 points) • 53 scientific publications in journals and conferences with scientific review (635 points); • 1 textbook and 1 lecture notes e-book; In 19 of the publications the candidate is an independent author, in 19 - he is the first author, in 21 - he is second author, and he is single author of the textbook and the lecture notes e-book (80 points). All presented scientific papers are in the scientific field of Automated Systems for Information Processing and Management. The total number of points from the presented 52 citations is 226 while the required are 100. Assoc. Prof. Dr. Eng. Atanas Atanassov has included 99 publications in the register of academic staff of National Academic Center for Information and Documentation, and after his habilitation in 2012 - 68, led or participated in 12 projects - from which 3 national projects are included in the current the procedure (40 points), he is supervisor or co-supervisor of 4 doctoral students (140 points), and he wrote 4 reviews (8 points) With the presented scientific publications, citations, monograph, textbook and lecture notes e-book, doctoral students' supervision and participation in projects, the candidate Assoc.

Prof. Dr. Atanas Atanassov fully meets the minimum national requirements for the academic position of "professor" in Technical Sciences.

1.2. Relevance of scientific and / or applied research:

A) The research is relevant. Part of the research is pioneering (no results are known on the topic by other authors)	8 points	
B) Research is relevant. Results from other authors are known for each of the topics and / or applications studied.	6 points	X
C) Most of the research is relevant, but also some results are presented that have no scientific and / or applied value	4 points	
D) The smaller part of the research is relevant	2 points	
E) Research is not relevant	0 points	
		one of the answers given is marked with the sign "X"

The evaluation of the relevance of the research must be substantiated.
The research and publication activity of the candidate Assoc. Prof. Dr. Eng. Atanas Atanassov is focused in the following areas: predictive maintenance of technological equipment; big data recommender systems; application of artificial intelligence methods (Case-Based Reasoning, Sentiment Analysis, Machine and Deep Learning) intended to adaptive and personalized student learning; metrics for proximity and similarity of scalar and vector functions in an absolute and a relative sense; requirements management systems for software project development; development of flexible, process-oriented software architectures and real-time systems, etc. The policy for implementation of information and communication technologies and digitalization of the economy is a sectoral policy with horizontal impact on all social and economic sectors. In the time of the Fourth Industrial Revolution, when the rapid growth of new technologies lead to unprecedented automation and digitization of real production and business processes, and information and data come from many different sources, thanks to the improvement of computer systems and low information storage costs, the need and importance of working with and analyzing big data is growing. This determines the exceptional relevance of the field of work of the candidate Assoc. Prof. Atanas Atanassov. The new approaches presented by him in solving a number of engineering problems and the results obtained in the field of automated systems for information processing and management through advanced research tools, as well as the implementation development of these approaches are of essential importance for engineering and scientific practice.

1.3. Objectives of the research:

A) Realistic and of scientific and / or applied interest	8 points	X
B) Realistic, but not of scientific and / or applied interest	4 points	
C) Unattainable (unrealistic)	0 points	
		one of the answers given is marked with the sign "X"

Objectives must be specified. The type of the set objectives must be justified
The goals set in the research presented in the scientific publications до Assoc. Prof. Atanas Atanassov are realistic and of scientific and scientific-applied interest and are grouped in several areas: 1. Predictive maintenance of technological objects and plants. Research and analysis on the topic are directed toward the development of a comprehensive system for predictive maintenance aiming the extending of the life-cycle of the technical equipment and systems and at the same time optimizing their repair costs. 2. Intelligent electronic learning systems based on artificial intelligence methods. These systems aim to personalize student learning based on adaptive learning, differentiated learning based on analysis of their cognitive abilities. 3. Metrics for proximity and similarity of scalar and vector functions in absolute and relative sense. The research is focused on methodologies for approximating functions that perform linear, boundary or integral conditions based on given functional dependencies and conditions obtained from experimental results, predictions of a mathematical model, theoretical requirements, etc. 4. Big data recommender systems. Research is aimed at developing approaches for the implementation of information on previous purchases (history) and customer satisfaction in order to provide high quality personalized customer recommendations by filtering big data and product spaces that accompany the work of companies, enterprises and businesses in e-commerce. 5. Requirements management systems for software project development. The research is aims the development of algorithms for improvement in the processes of analysis and management of the user and system requirements, as well as the requirement management duting the development, testing and maintenance of software for distributed real-time systems, as well as defining specific requirements for the developed management system, oriented toward a certain class of software projects. 6. Development of flexible, process-oriented software architectures and real-time systems. The aim is to develop a process-oriented approach for designing parallel algorithms for controlling continuous and discrete systems. The work on the set goals is related to the realization of several research projects in the listed fields, as well as the training and the supervision of several doctoral students.

1.4. Candidate research contributions:

A) With lasting scientific and / or applied response, they form the basis for new research and applications	20 points	
B) They are of significant scientific and / or applied interest, complete and / or summarize previous research	16 points	X
C) They are of scientific and / or applied interest	12 points	
D) Lack of significant contributions	8 points	
E) Lack of contributions	0 points	
		one of the answers given is marked with the sign "X"

Contributions must be specified. The type of results achieved must be justified.
I generally accept the summary of the main results and the scientific and scientific-applied contributions presented by the candidate. His scientific, scientific-applied and applied contributions can be assessed as enriching the existing knowledge in the field of automated information processing and management systems. The scientific and scientific-applied contributions of Assoc. Prof. Atanas Atanassov can be summarized as follows: • The characteristics and features of the predictive support of Peirce-Smith converters are analyzed, a database containing data from measurements and data based on knowledge is created, methods and algorithms for pre-processing and for predicting the state are developed, two software modules are developed, implementing various functionalities of the precedent method, a stochastic algorithm has been developed, simulating the wear of the wall of Peirce-Smith converters and a complete integrated software platform has been built in MicroStrategy Analytics software platform for Peirce-Smith predictive support. • Systems for personal registration and registration of emotions have been developed, algorithms for extraction and analysis of opinions from labeled data sets have been developed and a platform for adaptive testing of students' knowledge has been developed. • Four metrics for proximity and similarity of scalar and vector functions in absolute and relative sense are proposed, their applicability is considered and they are applied to find a similar function of a given objective function in the presence of boundary conditions and integral conditions of normalization or normalization with weight. • New collaborative filtering algorithms have been developed to generate recommendations from Big data based on cascade hybridization, as well as algorithms for opinion analysis for text analysis and trend prediction from large labeled data sets based on mixed hybridization. They are combined in a software platform - a cloud-based hybrid recommender system, on which an experimental assessment of the possibilities for prediction and classification on selected sets of labeled data has been made. • Requirements management system is developed for software project development, including eight modules: input / output module, modules are organized in a subsystem for managing different types of requirements (user, system, software and component) and

their organization into projects, a module for traceability and for baselines, a module for managing requests for changes in requirements and for assessing the impact of changes and a module for working with the database.
• A process-oriented design approach has been developed and implemented for the development of flexible, process-oriented software architectures and real-time systems based on parallel algorithms for controlling continuous and discrete systems.
The investigations, conclusions and scientific and scientific-applied ones of the candidate have been presented in international scientific journals and forums, including such that are indexed in Scopus, which together with the presented citations and the implemented applied solutions is a guarantee for the significance of the achieved results and contributions.

1.5. Participation of the candidate in the achievement of the presented results:

A) The candidate has at least an equal participation in the submitted papers	8 points	X
B) The candidate has at least an equal participation in most of the submitted papers	7 points	
C) The candidate has a secondary participation in most of the submitted papers	4 points	
D) The candidate participation is unnoticeable	0 points	
		one of the answers given is marked with the sign "X"

From all 64 scientific papers submitted at the current competition, in 19 of the publications the candidate is an independent author, in 19 - he is the first author, in 21 he is the second, and the textbook and the lecture-notes e-book are independent, i.e. the candidate has leading or at least equal participation in the submitted papers.

1.6 Pedagogical activity:

A) The candidate has effective and sufficient pedagogical activity at the university. The textbooks issued are modern and useful (they meet the requirements of the Regulations). The work with undergraduate and doctoral students is at a high professional level.	8 points	X
B) The candidate has sufficient pedagogical activity at the university. The textbooks issued satisfy the requirements of the Regulations.	6 points	

C) The pedagogical activity and / or textbooks issued are insufficient (do not meet the requirements of the Regulations)	0 points	
		one of the answers given is marked with the sign "X"

Critical notes must be provided if one of the items B or C is marked.
The candidate in the competition Assoc. Prof. Dr. Atanas Velkov Atanassov has been a lecturer at UCTM since 1985 and in the last five years he has been leading seven lecture courses for Bachelor's degree, one - for Master's degree and one doctoral course. He has supervised 5 doctoral students, four of them have defended their PhD. He is the author of a textbook in English and a lecture notes e-book on microprocessor technology.

1.7. Critical notes:

A) Lack of critical notes	8 points	X
B) Critical notes of a technical nature	7 points	
C) Critical notes that would partially improve the results achieved in a small part of the research	5 points	
D) Critical notes that would partially improve the results achieved in most of the research	3 points	
E) Significant critical notes	0 points	
		one of the answers given is marked with the sign "X"

Critical notes must be provided if one of the answers C, D or E is marked.
I have no critical notes for the candidate in the competition, Assoc. Prof. Dr. Atanas Velkov Atanasov.

1.8. Conclusion

A) The evaluation of the candidate's activity is **POSITIVE**	This evaluation is assigned to a total number of at least 50 points	X
B) The evaluation of the candidate's activity is **NEGATIVE**	This evaluation is assigned to a total number below 50 points	
		one of the answers given is marked with the sign "X"

To be filled in if requested by the member of the scientific jury
The overall scientific and teaching activity of the candidate gives me grounds to propose Assoc. Prof. Dr. Eng. Atanas Velkov Atanassov to be elected for the academic position "professor" in the scientific area of higher education - 5. Technical sciences, professional area - 5.2. Electrical engineering, electronics and automation, scientific specialty - "Automated systems for information processing and control" at UCTM.

21.4.2021 г.	The report was written by:	
date	**Prof. Dr. Eng. Elena Georgieva Koleva**	signature