R E V I E W

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of the materials submitted for participation in a competition for the academic position of "professor"
in the field of higher education – 5. Technical sciences,
in professional field – 5.3. Communication and Computer Engineering, specialty – "Automated Information Processing and Management Systems" (Internet-based systems, Databases in industrial systems, Technology of cyber-physical systems).

In the competition for a professor, announced in the Official Gazette, issue 48/13.06.2025 and on the website of the Technical University - Gabrovo, for the needs of the Department of "Automatics, Information and Control Engineering" at the Faculty of "Electrical Engineering and Electronics", Assoc. Prof. eng. Aldeniz Enverov Rashidov, PhD participated as a candidate.

1. Brief biographical data

Assoc. Prof. eng. Aldeniz Enverov Rashidov, PhD graduated in 1996 with a degree in Systems and Management from the Technical University of Gabrovo. In 1999, he began his academic career as an assistant professor in the Department of Automation, Information and Control Engineering at the Technical University of Gabrovo. In 2002, he led the team that developed and implemented the University Information System (UMIS) - a key tool for the university's information security, which was subsequently implemented in other higher education institutions in the country. Since 2005, he has held the position of Head of the Information Security Sector at the Technical University of Gabrovo. In 2006, he defended his dissertation on the topic "Intelligent Methods for Data Search and Processing in a University Information System" (in the scientific specialty "Automated Systems for Information Processing and Management") and obtained the educational and scientific degree "PhD". Since 2010, he has been elected as an associate professor in the professional field 5.2 "Electrical Engineering, Electronics and Automation", scientific specialty "Automated Systems for Information Processing and Control (Databases in Industrial Systems)" in the Department of "Automation, Information and Control Engineering" at the Technical University of Gabrovo. Since 2012, he has held the position of director of the Center for Electronic and Distance Learning at the Technical University of Gabrovo, actively working on the implementation of modern electronic platforms and digitalization of the educational process. In 2024, he was elected as a Senior Member of IEEE - recognition of his professionalism and scientific achievements.

2. General description of the materials presented

The candidate Assoc. Prof. eng. Aldeniz Enverov Rashidov, PhD participated in the competition with 55 scientific publications submitted for review, which can be grouped into the following categories:

- 22 scientific publications in journals that are refereed and indexed in world-renowned databases of scientific information (Scopus, WoS), of which 4 articles in journals with an impact factor (IF) (В.4, Г.7);
- 33 scientific publications in non-refereed peer-reviewed journals or in edited collective volumes (Г.8);
- Total of 55 publications, of which 23 independent.

The candidate is the author and co-author of 3 university textbooks (Е.23) and 2 teaching aids (Е.24). He has implemented creative developments, including the University Information System (UMIS). He has participated in 4 national and 3 international projects as a member of the scientific team and has been the leader of 1 national project and 9 university projects (Е.18–Е.21).

The documentation submitted by Assoc. Prof. eng. Aldeniz Enverov Rashidov, PhD for participation in the competition for the academic position "Professor" at TU-Gabrovo fully complies with the minimum national requirements established by the Act on the Development of the Academic Staff in the Republic of Bulgaria (ADASRB) and the requirements of the Regulations for the Acquisition of Scientific Degrees and the Occupancy of Academic Positions (RASDOAP) at TU - Gabrovo.

3. Reflection of scientific publications in scientific literature

I believe that the information provided about the candidate makes him recognizable in scientific circles in our country and abroad, as Assoc. Prof. Rashidov's scientific publications are significantly reflected in the scientific literature. The total number of known citations is 51, distributed as follows:

- 17 citations in scientific publications that are referenced and indexed in world-renowned databases of scientific information (Scopus, WoS) or in collective volumes (Д.12);
- 31 citations in peer-reviewed collective volumes (Д.13);
- 3 citations in non-refereed peer-reviewed journals (Д.14).

There is a presence of the candidate's publications in national and international scientific journals. Particular attention is paid to the references in publications indexed in world databases, which testify to the significance and relevance of his scientific contributions. The citations show that the scientific work of Assoc. Prof. Rashidov finds application in the research of other authors, both in the country and abroad, which is an indicator of their scientific impact.

4. Overview of the content of the presented papers

The candidate's scientific works are structured into three main thematic areas that reflect his research and applied activity. Each area includes a group of publications addressing a certain range of problems and is presented with the corresponding results and contributions.

The publications in the first thematic area **"Applications of Artificial Intelligence for Process Automation and Optimization"** demonstrate how artificial intelligence (AI) can be used for automation, optimization, and strategic management of processes in scientific and other contexts. The developed models and algorithms aim to reduce manual operations, increase efficiency and transparency in decision-making. In [1], the application of AI in scientific research is analyzed, including automation of stages such as trend analysis, hypothesis generation and originality checking. Publications [2], [11] offer algorithms to support peer review through language models, SWOT analysis and weighting factors, ensuring objectivity and thoroughness. In [3], [10], [14], [15], algorithms for selecting scientific topics, automated creation of abstracts and formatting of citations are developed, which support the generation of new ideas and the structuring of scientific publications. More innovative applications are considered in [4], where an architecture for “digital olfaction” is proposed, integrating electronic noses, aroma generators and language models, with applications in industry, medicine and virtual reality. The AISIQ metrics for assessing the intelligence of AI systems [21] provide objective indicators of efficiency, adaptability and reliability, supporting the implementation of AI technologies. In [12], ethical, social and legal challenges related to algorithmic bias and the need for ethical frameworks and an interdisciplinary approach are analyzed. In summary, these studies demonstrate the role of AI as a catalyst for innovation and transformation – a means of automating complex operations, increasing efficiency and creating new opportunities for interaction in real and virtual environments.

Publications in the second thematic area “**Automated information processing and management systems”** are aimed at improving methods for data management, process automation and resource optimization. In [5], [6], [26], [28], [29] traditional architectures are analyzed and solutions for their modernization are proposed, and in [24], [25], [27] a hybrid model for efficient processing of distributed data is proposed. The WDCLF method [16] extends database design through a multi-layered web architecture, and DCLF+ [45] meets the needs of decentralized systems. Security is considered in [31], [36], where technologies for protecting web applications and databases are proposed. The immune method for management decisions [9] eliminates subjectivism, and its applications [8], [34] demonstrate effective automation of management processes. Approaches to economic tasks are described in [34], [42], [43]. Automated lighting and environmental control systems [7], [44], [47] use sensors and IP technologies to improve energy efficiency. Automated scheduling algorithms [13], [20], [22], [53] and financial models [35] optimize

the management of academic resources, while [49], [51], [53] offer solutions for e-learning and distance learning. Specialized applications [38] present a medical information system with online access, and [48] a system for real-time monitoring of production activities. In summary, research in this area highlights the importance of innovations in automation and control, contributing to efficiency, security and sustainability in various industrial and academic environments.

The publications in the third thematic area **"Digitalization of Educational and Administrative Processes"** are aimed at the design and implementation of electronic systems and platforms that automate and digitize educational and administrative activities. The main emphasis is on increasing the efficiency, transparency and accessibility in the academic environment. In [17], [18], [19] an electronic voting system is presented, ensuring security and reliability in electoral processes through modern technologies and protocols. The publications [23], [46], [50] consider methods for analyzing preferences and automated data processing, supporting management decisions and resource optimization. In [32], [52], [54], [55] mobile and distance learning platforms are proposed, integrating mechanisms for automation and personalization of the learning process. An electronic survey system [30] automates the creation and processing of surveys, increasing the accuracy of the results. The studies [37], [41] are devoted to virtual environments for electronic testing, providing automated assessment and remote testing with high objectivity. In [33], [40], systems for automation of academic and administrative activities – student admission, management of scientific activity and allocation of resources are considered. In general, the works in this area emphasize the role of electronic systems and technologies as a factor for transformation and sustainable development of the university infrastructure, ensuring efficiency, accessibility and transparency of processes, as well as higher user satisfaction.

All submitted works are related to research and teaching activities in the scientific field of the competition. A review of the documents shows that their content confirms that the candidate not only meets the requirements, but also significantly exceeds the minimum scientometric indicators.

5. General characteristics of the candidate's activities

5.1. Educational and pedagogical activity (work with students and doctoral students)

The candidate is an established lecturer at the Technical University of Gabrovo, with many years of experience in teaching students of all educational and qualification levels - "bachelor", "master" and "doctor".

He lectures in 11 academic disciplines in bachelor's and master's programs at TU - Gabrovo, including: Internet-based systems, Databases in industrial systems, Industrial networks and interfaces, Programming of mobile devices, Technology of cyber-physical systems, Information systems and databases in technical safety, as well as in specialized master's courses in Industrial information systems, Information systems for personnel management and Internet-based systems in the social sphere. In doctoral programs, he is the holder of 5 disciplines: ICT in research work, Industrial networks and systems, Internet-based information systems, Databases and Programming of mobile devices.

His activities go beyond the framework of TU - Gabrovo. He has lectured in 6 disciplines at universities abroad, as well as in 2 disciplines at other higher education institutions in the country (e.g. Varna Free University "Chernorizets Hrabar"). To ensure the educational process, Assoc. Prof. Rashidov has developed a total of 16 curricula. He has published 3 university textbooks and 2 teaching aids, which are used in the training of students and doctoral students. He is the supervisor of over 65 graduates in the "bachelor" and "master" programs and is the scientific supervisor of 1 successfully defended doctoral student. The candidate's actual academic and pedagogical training and activities fully meet the requirements for this group of indicators.

5.2. Scientific and scientific-applied activities

To participate in the competition, the candidate has submitted a total of 55 scientific publications, including journal articles and conference reports. Of these:

- 22 scientific publications in refereed and indexed journals in world-renowned databases (Scopus, WoS), of which 4 articles in journals with an impact factor (IF);

- 33 publications in non-refereed peer-reviewed journals or in edited collective volumes;
- A total of 23 are independent publications, and the rest are co-authored, with the candidate being the first or lead author in a significant number of them..

The publications are in Bulgarian and English, with a significant part being presented at international scientific forums and in specialized publications with international visibility. In addition to these, 3 university textbooks and 2 teaching aids are also included. The publications do not repeat the works presented when holding the ONS "doctor" and the academic position "associate professor". Assoc. Prof. Rashidov has an active participation in national and international scientific and educational projects. The materials for the competition indicate: participation in 4 national projects, 3 international projects as a member of a scientific team and leadership of 1 national project and 9 university projects.

The submitted documentation includes evidence of compliance with the minimum national requirements according to the ADASRB, as well as the internal requirements of TU - Gabrovo for holding the academic position of "professor".:

Group of indicators	Contents	Minimum required points by groups of indicators for holding the academic position of "Professor"	Declared points by groups of indicators for holding the academic position of "Professor"
А	Indicator 1	50	**50**
Б	Indicator 2	-	-
В	Indicators 3 and 4	100	**630**
Г	Sum of indicators from 5 to 11	200	**696.66**
Д	Sum of indicators from 12 to 15	100	**269**
Е	Sum of indicators from16 to the end	150	**290**

Contents	Minimum requirements of the Technical University of Gabrovo for candidates for the academic position of "Professor"	Declared indicators by the candidate for the academic position "Professor"
Total number of publications (articles and reports)	30, of which at least 5 independent and 3 with IF (WoS)	**55, of which 23 independent and 4 with IF (WoS)**
Number of known citations by other authors	20	**51**
Published textbooks/books	2	**3**
Published teaching aids	-	**2**
Number of successfully defended doctoral dissertations	1	**1**
Project management and/or contracts for borrowed funds	3	**9**

I believe that the information presented regarding the candidate's scientific and scientific - applied activities fully meets and in some indicators exceeds the requirements for holding the

academic position of "professor" and in accordance with the ADASRB, the Regulations for its implementation and the RASDOAP at the Technical University of Gabrovo.

5.3. Implementation activity

The candidate has developed and implemented a number of systems and solutions with high practical value. His most significant achievement is the creation and implementation of the University Information System (UMIS) - an integrated platform for managing academic and administrative processes, initially implemented at the Technical University of Gabrovo, and subsequently in other higher education institutions in the country.

Along with the UIS, Assoc. Prof. Rashidov has developed and implemented two more key systems that are in the process of operation at the Technical University of Gabrovo.:

- "Virtual environment for year-round online exams" that ensures flexibility, objectivity and accessibility of the testing process;
- "Virtual environment for year-round admission of candidate documents", through which the application process in higher education is digitized and optimized.

Through these implementations, Assoc. Prof. Rashidov has a direct impact on increasing the efficiency, transparency and quality of academic processes

6. Contributions (scientific, scientific-applied, applied)

I accept the contributions presented by the author, which I define as scientific, scientific-applied and applied, all of which directly correspond and relate to the scientific interests of the candidate and the topic in the field of the competition:

Scientific contributions:

- A concept for integrating AI into scientific research has been developed, including automated analysis of scientific publications, hypothesis generation, and originality assessment.
- A method for assessing the intelligence of AI systems (AISIQ) has been developed, based on a structured analysis of multiple intellectual factors and a correction factor related to the age of the system.
- A conceptual architecture for digital olfaction has been created, which integrates an electronic nose, an aroma generator, and large language models (LLM) for odor recognition, analysis, and reproduction.
- A WDCLF method for designing web databases has been developed, based on a multi-layer architecture that accelerates design and integration with external systems.
- A DCLF+ method for designing distributed databases has been developed, which meets the requirements of decentralized business structures and improves scalability and efficiency.
- An immune method for making management decisions has been developed, based on the principles of the cellular immune response, which eliminates subjectivity and overcomes the limitations of mathematical modeling.
- Methods for analyzing consumer preferences in educational and administrative environments have been developed that optimize decision-making processes.

Scientific-applied contributions:

- Algorithms for reviewing scientific manuscripts and project proposals via ChatGPT have been developed, including SWOT analysis and weighting factors that increase the objectivity, accuracy and efficiency of the process.
- Algorithms for selecting scientific topics, automated summarizing and formatting citations have been developed, integrating relevance analysis, linguistic processing and scientific validity.
- An analysis of architectures for structuring, storing and processing data in a cloud environment has been performed, which provides a basis for increasing the accessibility and efficiency of databases for a wide range of users.
- Models and algorithms for automated scheduling have been developed, which optimize resource management in higher education.

- A hybrid model for integrating centralized tables and information matrices has been developed, providing more efficient structuring and processing of distributed data in dynamic environments.
- Methods for protecting web applications and preventing unauthorized access are proposed, which increase the security of databases and servers in corporate and academic environments.
- Universal database models and structures for automating management decisions are developed, which demonstrate the applicability of methodologies such as MAPSMET.
- Automated models for managing academic resources are developed, which increase transparency and efficiency.
- An analysis of the advantages and limitations of cloud-based databases compared to traditional approaches is performed.
- A methodology for managing scientific activity is developed, which connects academic research with market requirements.
- A concept for electronic surveying with centralized management, encrypted communication, and real-time analysis is developed.

Applied contributions:

- Strategies have been developed to minimize bias and increase public trust in AI by creating ethical frameworks, regulatory mechanisms and algorithmic adjustments.
- Systems for automated control of lighting and environmental parameters have been developed, which improve energy efficiency in industrial and administrative environments.
- Systems for automated process control based on the immune method have been developed, which provide efficiency and optimization in management decisions.
- A medical information system has been developed, which provides global access to medical information and optimizes time and costs.
- A production execution system for registering and monitoring activities in real time has been developed, which improves management mechanisms in production.
- Solutions for optimizing the learning process have been implemented, which improve access to educational materials and the management of learning activities in higher education institutions.
- An electronic voting system has been developed and implemented, which provides security, transparency and reliability in electoral processes.
- A system for managing scientific activities has been designed and developed based on a proposed methodology, which has been implemented for the optimization of academic processes.
- An electronic survey system has been designed and developed based on the proposed methodology, which automates the survey processes.
- Virtual environments for electronic testing have been created, which automate assessment and provide interactive opportunities for exam management.
- A system for automating student admission and resource allocation has been implemented, which improves administrative efficiency.
- Mobile and distance learning platforms have been developed, which facilitate access to learning resources and increase the efficiency of the learning process.

7. Assessment of the candidate's personal contribution

One of the main indicators of the candidate's merits is his personal participation in the above-mentioned scientific and scientific-applied contributions. I believe that the presented scientific contributions contained in the candidate's works are relevant and significant for the development and enrichment of scientific research in the field of the competition and are of importance for science and practice. Out of a total of 55 publications, 23 are independent, and the rest are co-authored, with the candidate being the first or leading author in a significant part of them.

The nature of his scientific works, the broad thematic scope and the long-term consistency in research testify to high scientific maturity and independence in the formation and implementation of

research ideas. His participation in implementations and real projects is direct and demonstrable - most of the developments, including the University Information System (UMIS) and the virtual environments for online exams and student admission, are the result of his leading concept, architecture and program implementation.

His rich educational, scientific-research and organizational activities prove a high level of professional competence, responsibility and contribution to the development of the academic community. The materials presented in the competition leave no doubt that the candidate's scientific and applied achievements are the result of his personal work and significant creative participation in team research.

8. Critical notes and recommendations

Some formal and substantive notes can be made on the presented materials. It is recommended that the candidate continue his active participation with publications in foreign journals and conferences indexed in Scopus, which would contribute to wider visibility and a greater number of citations of his scientific works. A good direction for development is also participation as a coordinator or lead researcher in larger-scale international projects, which will allow for even more significant practical results and implementations of the developed systems. In view of the wide spectrum of disciplines taught, a more targeted focus on the leading areas - automated information systems, digitalization and artificial intelligence, which most fully reflect the scientific and pedagogical competence of the candidate, can be recommended.

9. Personal impressions

I have known Assoc. Prof. Rashidov for over 20 years and I believe that he is a worthy, modest and correct colleague who conscientiously fulfills his duties as a university lecturer and researcher, demonstrates the necessary academic ethics towards his colleagues and students. Regarding his scientific, teaching and organizational activities, I believe that he has in-depth knowledge in the field of automated information processing and management systems and demonstrates broad scientific and professional interest, encompassing neighboring areas such as digitalization, artificial intelligence and e-learning. He is distinguished by high responsibility, correctness and teamwork skills, as well as proven qualities as an organizer and leader of scientific projects and teams. He enjoys respect and trust among his colleagues and the academic leadership of TU - Gabrovo.

10. Conclusion

Assoc. Prof. Rashidov presents himself with scientific works, developments and creative achievements that convincingly defend his claims in the competition for the academic position of "professor".

The following generalizations influence the conclusion reached:

- The candidate has presented scientific papers and original scientific-applied achievements at a high academic level, which fully cover and exceed the minimum national and internal requirements of TU - Gabrovo for holding the position of "professor".
- Demonstrates the qualities of an established scientist and researcher in the field of automated information processing and management systems, digitalization and e-learning.
- Demonstrates the ability to independently set and solve scientific tasks, to develop innovative methods and systems, as well as to organize and lead scientific teams and projects.

Considering the above,

I propose that Assoc. Prof. eng. Aldeniz Enverov Rashidov, PhD be elected as a "professor" in the field of higher education - 5. Technical Sciences, professional field - 5.3. Communication and Computer Engineering, specialty "Automated Information Processing and Management Systems" (Internet-based systems, Databases in industrial systems, Technology of cyber-physical systems).

20.10.2025 ***Reviewer:*** ……

(*Prof. eng. Stanimir Sadinov, PhD*)