

R E V I E W

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of the materials submitted for participation in the competition for the academic position of "Professor" in the field of higher education – 5. Technical Sciences, in the professional field – 5.3. Communication and Computer Engineering, scientific specialty – "Automated Information Processing and Management Systems" (Internet-based Systems, Databases in Industrial Systems, Cyber-Physical Systems Technology).

In the competition for professor, announced in the State Gazette, issue 48/13.06.2025 and on the website of the Technical University – Gabrovo, for the needs of the "Automation, Information and Control Engineering" at the Faculty of Electrical Engineering and Electronics, the candidate is Assoc. Prof. Dr. Eng. Aldeniz Enverov Rashidov

1. Brief biographical information

Assoc. Prof. Dr. Eng. Aldeniz Enverov Rashidov is a graduate of the Technical University of Gabrovo. In 2006, he defended his dissertation on "Intelligent methods for searching and processing data in a university information system." Since 2010, he has been an associate professor in the same scientific field with a thematic focus on "Databases in industrial systems" in the Department of Automation, Information and Control Engineering. In 2005, he was appointed head of the "Information Security" sector, and since 2012 he has been director of the Centre for Electronic and Distance Learning. Assoc. Prof. Rashidov has developed and implemented several information systems with high practical value, including the University Information System (UMIS), the Moodle+ virtual environment, and an online platform for the admission of prospective students, which are used in real operation at the Technical University of Gabrovo.

2. General description of the submitted materials

The materials presented by the candidate include scientific publications, textbooks, teaching guides, citations, participation in projects and implemented developments.

Scientific works and educational publications:

- Total – 60, of which 23 are independent publications;
- First author – 12, second author – 24, third author – 1;
- Publications abroad – 17, in the country – 43;
- Publications in a foreign language – 37, in Bulgarian – 23;
- Textbooks and manuals – 5 (3 independent books, 2 co-authored);
- Articles – 9, of which 4 in publications with Impact Factor (WoS);
- Reports – 46.

Classification by type:

- Articles – 9 (15%);
- Reports – 46 (77%):
 - Abroad – 17 (29%);
 - At international conferences in Bulgaria – 23 (38%);

- At national conferences – 6 (10%).
- Textbooks and teaching aids – 5 (8%).

Projects

- Participation in a total of 26 projects, of which:
 - 1 national project as leader;
 - 9 university projects (leader);
 - 4 national projects (participant);
 - 3 international projects (participant);
 - 9 university projects (participant);

Training of doctoral students and graduates

- Supervision of 6 doctoral students (1 successfully defended, 3 expelled with the right to defend, 1 in training, 1 transferred);
- Supervision of 69 graduates – 43 bachelor's and 26 masters.

Other academic and professional activities:

- Membership in editorial boards and committees – 19 (11 in indexed publications, 5 in international conferences, 3 in national conferences);
- Membership in scientific and professional organisations – IEEE (Senior Member, CS, CIS, RAS, Education Society), SAI;
- Participation in scientific juries – 1;
- Implemented creative achievements – 3 (in actual use).

The submitted reports certify that the total sum of scient metric indicators is 1935.66 points, with a minimum requirement of 600 points, which proves high scientific and publication activity.

The materials presented are formatted in accordance with the requirements of the national quantitative indicators as well as the requirements of the Technical University - Gabrovo.

3. Reflection of scientific publications in scientific literature

The scientific works of Assoc. Prof. Rashidov have been reflected in the scientific community, which testifies to their contribution and significance in the field of automated and Internet-based information systems.

The total number of citations is 51, of which:

- 17 of them are in scientific publications, referenced and indexed in world-renowned databases (WoS, Scopus, IEEE Xplore);
- 31 are in collective volumes with scientific review;
- 3 are in non-referenced peer-reviewed journals.

The candidate's publications are referenced in works by Bulgarian and foreign authors, which is an indicator of their international recognition.

It can be concluded that the scientific activity of Assoc. Prof. Rashidov has a sustained presence in scientific publications in Bulgaria and abroad, with citations confirming the impact and academic recognition achieved in the professional community.

4. Overview of the content of the presented works

The candidate's scientific works are systematised into three main thematic areas. Each of the areas demonstrates completeness, relevance and contribution to the development of engineering and information technologies.

Thematic area 1: "Applications of artificial intelligence for process automation and optimisation":

This thematic area covers research aimed at implementing artificial intelligence for automation, optimisation and strategic management of processes in scientific and

technological contexts. It analyses the role of AI in scientific research and the automation of key stages such as trend analysis and verification of the originality of publications: algorithms are presented to support the review process using SWOT analysis and weighted evaluation coefficients; algorithms are proposed for the automated creation of abstracts, formatting of citations and selection of research topics, emphasising the integration between artificial intelligence and expert human experience. A conceptual architecture for digital smell has been proposed, integrating electronic noses, aroma generators and language models. An objective methodology has been developed to assess the degree of intelligence of the system, analysing the ethical and social aspects of the application of AI.

Thematic area 2: "Automated information processing and management systems":

This area includes research related to the development of innovative data management systems, process automation and resource optimisation. The publications analyse data management architectures and propose solutions for modernisation through the integration of centralised tables and information matrices; presenting methods for database design, including the WDCLF method, as well as DCLF+. This area also examines aspects of web application security and data protection. Concepts and prototypes of systems for the automation of management decisions are also proposed, as well as algorithms for automated scheduling.

This area confirms the candidate's contributions to the development of intelligent and sustainable solutions for information and resource management in various environments.

Thematic area 3: "Digitisation of educational and administrative processes":

Research in this area is devoted to the design and implementation of electronic platforms for the automation of educational and administrative activities. Publications describe electronic voting systems with a high degree of security and transparency; methods for preference analysis and automated data processing for the optimisation of management decisions; platforms for mobile and distance learning; electronic survey systems; virtual environments for electronic testing and the automation of academic and administrative activities.

5. General description of the candidate's activities

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

Assoc. Prof. Rashidov has many years of teaching experience and teaches 11 disciplines, including: "Industrial Information Systems", "Databases in Industrial Systems", "Internet-based Systems", "Mobile Device Programming", "Cyber-Physical Systems Technology," "Information Systems for Personnel Management". The subjects are included in the curricula of the specialties "Automation, Robotics and Computer Control Systems", "Industrial Management", "Technical Safety" and others, both in full-time and part-time forms of study. As a lecturer, he has also taught at foreign universities, including Alanya Alaaddin Keykubat University (2023, 2024), Nevşehir Hacı Bektaş Veli University (2024), Trakya University – Edirne (2011) and Namik Kemal University – Çorlu (2012). The topics of the lectures are related to Internet-based systems, Cyber-Physical Systems, and the Internet of Things (IoT). The candidate has participated in the development of 16 curricula for bachelor's, master's and doctoral programmes. Assoc. Prof. Rashidov has lectured on two disciplines at other higher education institutions in the country.

The candidate's teaching activity is characterised by a high level of responsibility, consistency and an innovative approach, combining theory, practice and the use of modern technologies in education.

5.2. Scientific and applied scientific activity

The scientific and applied scientific activity of Assoc. Prof. Rashidov is characterised by consistency, interdisciplinarity and a high degree of practical orientation. The candidate has presented 55 scientific publications, including articles and conference papers, 22 of which have been published in refereed and indexed journals (Scopus, Web of Science), including 4 articles with impact factor, and 33 publications are in non-refereed journals and collective volumes with peer review. A total of 23 works are independent, and in the rest, Assoc. Prof. Rashidov is the first or leading author, which highlights his personal contribution and active role in research teams. The publications are written in Bulgarian and English, and most of them have been presented at international scientific forums and published in high-visibility specialist publications. In addition, there are three textbooks and two teaching aids that support the training of students and doctoral students. The total number of works presented is 60, and they do not repeat the publications included in previous academic procedures.

The candidate's research presents original methods and algorithms in the fields of artificial intelligence, process automation, database design, and the digitisation of educational and administrative systems.

Assoc. Prof. Rashidov has actively participated in 26 research and educational projects, 10 of which as a leader, including 1 national, 9 university, 4 national and 3 international as a member of a research team.

The information presented confirms full and exceeded fulfilment of the minimum national and institutional requirements for the academic position of "professor".

The candidate's scientific and applied scientific activity demonstrates high productivity, contributory nature and sustained research activity, which contributes to the development of modern automated systems in science, education and industry.

5.3. Implementation activity

The implementation activity of Assoc. Prof. Rashidov has made a significant contribution to the digitisation and modernisation of the university environment. It covers the design, development and implementation of information, administrative and educational systems with a high degree of automation and reliability.

1. Among the most significant developments is the University Information System (UMIS) of the Technical University - Gabrovo, which automates the entire process of administrative, educational and scientific services. The system has been operating successfully for more than two decades and is a key element of the university's digital infrastructure.

2. The web-based electronic survey system, which is used to conduct and process academic surveys.

3. Virtual environments for e-learning and testing, integrating modern IT solutions and supporting distance learning for students. The implemented systems have a proven effect - they increase the efficiency, security and sustainability of information processes in academic practice.

6. Contributions (scientific, applied research contributions, applied)

The candidate's contributions are very well balanced and organised. I accept them as proposed:

A - Scientific contributions:

- A concept for the integration of 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 coefficient related to the age of the system.

- A conceptual architecture for digital smell has been created, integrating an electronic nose, an aroma generator and large language models (LLM) for the recognition, analysis and reproduction of smells.
- A WDCLF method for designing web databases based on a multi-layer architecture has been developed, which speeds up design and integration with external systems.
- The DCLF+ method for designing distributed databases has been developed, which meets the requirements of decentralised business structures and improves scalability and efficiency.
- An immune method for management decision-making has been developed, based on the principles of cellular immune response, which eliminates subjectivity and overcomes the limitations of mathematical modelling.
- Methods for analysing consumer preferences in educational and administrative environments have been developed, which optimise decision-making processes.

B - Applied research contributions:

- Algorithms have been developed for reviewing scientific manuscripts and project proposals through ChatGPT, including SWOT analysis and weighting coefficients that increase the objectivity, accuracy and efficiency of the process.
- Algorithms have been developed for selecting scientific topics, automated summarisation and formatting of citations, integrating analyses of relevance, linguistic processing and scientific validity.
- An analysis of architectures for structuring, storing and processing data in a cloud environment has been carried out, providing a basis for improving the accessibility and efficiency of databases for a wide range of users.
- Models and algorithms for automated scheduling have been developed to optimise resource management in higher education.
- A hybrid model for the integration of centralised tables and information matrices has been developed, ensuring more efficient structuring and processing of distributed data in dynamic environments.
- Methods for protecting web applications and preventing unauthorised access have been proposed, which increase the security of databases and servers in corporate and academic environments.
- Universal models and database structures for the automation of management decisions have been developed, demonstrating the applicability of methodologies such as MAPSMET.
- Automated models for academic resource management have been developed, which increase transparency and efficiency.
- An analysis of the advantages and limitations of cloud-based databases compared to traditional approaches has been performed.
- A methodology for managing scientific activity has been developed that links academic research to market requirements.
- A concept for electronic surveying with centralised management, encrypted communication and real-time analysis has been developed.

B - Applied contributions:

- Strategies have been developed to minimise bias and increase public trust in AI by creating ethical frameworks, regulatory mechanisms and algorithmic corrections.
- Systems for automated control of lighting and environmental parameters have been developed to improve energy efficiency in industrial and administrative environments.

- Systems for automated process control based on the immune method have been developed, ensuring efficiency and optimisation in management decisions.
 - A medical information system has been developed that provides global access to medical information and optimises time and costs.
 - A production execution system for real-time recording and monitoring of activities has been developed, which improves management mechanisms in production.
 - Solutions for optimising the learning process have been implemented, improving access to educational materials and the management of learning activities in higher education institutions.
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- An electronic voting system has been developed and implemented, ensuring security, transparency and reliability in electoral processes.
 - A system for managing scientific activity has been designed and developed based on a proposed methodology, which has been implemented to optimise 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.
 - Platforms for mobile and distance learning 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

The personal contribution of Assoc. Prof. Rashidov to scientific research and applied activities is indisputable. His works are distinguished by the originality of ideas, methodological soundness and a clear focus on practical solutions. The candidate is the author and co-author of several algorithms and methods for process automation and optimisation, implemented in real engineering, administrative and educational environments. The systems he has created demonstrate efficiency, reliability and sustainability, translating the results of scientific research into practice. Through his many years of teaching, Assoc. Prof. Rashidov has established himself as a leading expert in the field of automated systems and the digitisation of academic processes. He is a Senior Member of the Institute of Electrical and Electronics Engineers (IEEE).

8. Critical remarks and recommendations.

1. Recommendations can be made for building on and expanding the results achieved.
2. Deepening experimental analyses and conducting comparative studies with other established approaches related to artificial intelligence and process automation methods.
3. In the future, it would be appropriate to integrate these results into large-scale international projects and partnerships, which will enhance the practical value and applicability of scientific achievements.
4. The research results should be presented more widely in specialised international publications with an impact factor, which will enhance their visibility and sustainable academic impact.

The comments made are entirely constructive in nature and do not diminish the high scientific and professional assessment of the work of Assoc. Prof. Rashidov.

9. Personal impressions

I have direct observations of the professional and academic activities of Assoc. Prof. Rashidov. He is distinguished by his high competence, responsibility and consistency in fulfilling his scientific and teaching commitments. Assoc. Prof. Rashidov shows exceptional

initiative and analytical thinking, combining in-depth theoretical knowledge with practical experience. He is demanding, organised and fair in his work, demonstrating a high level of academic communication and cooperation.

10. Conclusion

Based on the materials presented, I conclude that Assoc. Prof. Rashidov possesses all the professional and scientific qualities necessary to hold the academic position of "professor".

My reasoning is as follows:

- The candidate has demonstrated a high scientific level, original contribution to his research, and sustained research and teaching activity. His works and achievements meet and exceed the requirements of the Law on the Development of Academic Staff in the Republic of Bulgaria and the regulations of the Technical University of Gabrovo.
- He has established himself as a renowned researcher and scientist in the field of automated information processing and management systems, as well as in the digitisation of educational processes.
- He has demonstrated an ability to identify priority scientific areas, propose original solutions and seek practical solutions.

In view of the above, I propose that Assoc. Prof. Dr. Eng. Aldeniz Enverov Rashidov, PhD to be awarded the academic position of "Professor" in the field of higher education - 5. Technical sciences, professional field - 5.3. Communication and Computer Engineering, speciality "Automated Information Processing and Management Systems" (Internet-based Systems, Databases in Industrial Systems, Cyber-Physical Systems Technology).

17.10.2025

Reviewer:
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