

REVIEW

by **Corr. Member Lyubka Atanasova Doukovska, PhD, DSc**
from the Institute of Information and Communication Technologies,
at the Bulgarian Academy of Sciences,
on the Competition for the academic position “**Professor**”,
under the Scientific Field: 4. Natural Sciences, Mathematics and Informatics,
the Professional Area: 4.6. Informatics and Computer Sciences,
the Scientific Specialty: Informatics,
for the needs of the Information Processes and Decision Support Systems Department
of the Institute of Information and Communication Technologies - BAS,
announced in Darjaven Vestnik No. 87 of 15.10.2024
with a participant - **Associate Professor Leoneed Mihaylov Kirilov, PhD**

In accordance with Order No. 311 of 13.12.2024 of the Director of the Institute of Information and Communication Technologies - BAS, I was included in the Scientific Jury of the competition for occupation of the academic position “Professor” in the Scientific Field 4. Natural Sciences, Mathematics and Informatics, the Professional Area 4.6 Informatics and Computer Science, the Scientific Specialty “Informatics”, announced in the Darjaven Vestnik, Issue 87 of 15.10.2024, for the needs of the Information Processes and Decision Support Systems Department at the Institute of Information and Communication Technologies - BAS, with the sole participant in the competition - **Associate Professor Leoneed Mihaylov Kirilov, PhD.**

Leoneed Mihaylov Kirilov was born on July 9, 1961 in the town of Pirdop. He received his Master's Degree in Mathematics in 1984 from the Sofia University St. Kliment Ohridski. From February 1, 1988 he was enrolled as a PhD student in the Institute of Technical Cybernetics and Robotics at the Bulgarian Academy of Sciences. He obtained the degree of Candidate of Technical Sciences (PhD) in 1993 by decision of the Higher Attestation Commission with Protocol No. 5 of 24.04.1993. Since 1987, he

has been appointed to a scientific position at the Bulgarian Academy of Sciences, having been consecutively in the composition of the following institutes - Institute of Cybernetics and Robotics (ITCR-BAS), Institute of Informatics (II-BAS), Institute of Information Technologies (IIT-BAS) and Institute of Information and Communication Technologies (IICT-BAS). In 1998 he was appointed Associate Professor at the Institute of Information Technology (IIT-BAS) and since 2010 he has held the same position at the Institute of Information and Communication Technologies (IICT-BAS).

As a member of the Scientific Jury I have received the following documents:

1. Order No. 311 of 13.12.2024 of the Director of the Institute of Information and Communication Technologies;
2. Application for participation in the competition by Associate Professor Leoneed Mihaylov Kirilov;
3. A European Curriculum Vitae of Associate Professor Leoneed Mihaylov Kirilov;
4. Copy of the diploma for educational and scientific PhD degree of Associate Professor Leoneed Mihaylov Kirilov;
5. Copy of the certificate of awarding the academic position “Associate Professor” to Associate Professor Leoneed Mihaylov Kirilov;
6. Certificate of work experience in the specialty of Associate Professor Leoneed Mihaylov Kirilov;
7. List of scientific publications, with which the applicant participates in the competition, which do not repeat the ones submitted for the acquisition of the educational and scientific PhD degree and for the occupation of the academic position “Associate professor”;
8. List of Associate Professor Leoneed Mihaylov Kirilov noted quotations;
9. Summaries of the scientific publications with which the applicant participates in the competition - in Bulgarian and English;
10. Copies of all scientific publications with which the applicant participates in the competition;

11. Information for fulfillment of the minimum national requirements under Art. 2b, # 2 and # 3 and the requirements of the Institute of Information and Communication Technologies - BAS under Art. 2b, # 5, prepared, based on documents submitted for the competition provided by Associate Professor Leoneed Mihaylov Kirilov;

12. Reference for the original scientific and applied scientific contributions of Associate Professor Leoneed Mihaylov Kirilov;

13. Statement for no proven plagiarism in the scientific works of Associate Professor Leoneed Mihaylov Kirilov.

According to the requirements of the *Development of Academic Staff Act in the Republic of Bulgaria* and the specific requirements in the Act's Institutional Regulation, the candidates for occupying the academic position of "Professor" must meet the following conditions, regulated in Art. 29. (Darjaven Vestnik issue 81 of 2010 - Decision No. 11 of 05.10.2010 of the Constitutional Court of the Republic of Bulgaria under cadastral plot No. 13/2010; amend in full, issue 101 of 2010; amend. and supplement, issue 30 of 2018, effective 05.05.2018) (1):

1. Have acquired the educational and scientific PhD degree;

2. Have held the academic position of "Associate Professor" at the same or another higher education institution or scientific organization for at least two academic years or at least five years;

3. Have submitted published monographs or equivalent publications in specialized scientific editions that do not repeat the ones submitted for the PhD degree and for the academic position of "Associate Professor";

4. Have submitted other original research papers, publications, inventions and other scientific and applied developments that are evaluated as aggregate;

5. To comply with the minimum national requirements under Art. 2b, # 2 and # 3, respectively, of the requirements of art. 2b, # 5;

6. Not to have plagiarism proven in the statutory order in scientific works.

(3) Applicants shall submit a report on the fulfillment of the minimum national requirements under Art. 2b, # 2 and # 3, respectively, of the requirements of art. 2b, # 5,

and a reference to the original scientific contributions, to which the relevant evidence set out in this Act, in the regulation for its implementation, and the regulations of higher schools and scientific organizations.

Associate Professor Leoneed Mihaylov Kirilov fulfills the requirement of Art. 29 (1) item 1 of the *Development of Academic Staff Act in the Republic of Bulgaria*, because by a decision of the Presidium of the Higher Attestation Commission at the Council of Ministers of the Republic of Bulgaria, based on a PhD Thesis's on the topic "Interactive Methods for Solving Multiple Objective Mathematical Programming Problems", a diploma No. 28987/30.06.1993 was issued, for the scientific degree Candidate of Technical Sciences (PhD).

Associate Professor Leoneed Mihaylov Kirilov also meets the requirement of Art. 29 (1) item 2 of the *Development of Academic Staff Act in the Republic of Bulgaria*, because the official note with Ex. No. 763/20.11.2024, signed by the Director of the Institute of Information and Communication Technologies, certifying that **Associate Professor Leoneed Mihaylov Kirilov** has a total work experience in the specialty of 40 years and 9 months at date of competition.

Associate Professor Leoneed Mihaylov Kirilov also fulfills the requirement of Art. 29 (1) item 3, as a published collective monographic work is presented:

Bournaski, E., R. Iliev, L. Kirilov, *Computer modeling of hydrological processes and river basins management*, Prof. Marin Drinov Publishing House of Bulgarian Academy of Sciences, ISBN 978-619-245-192-9, 340 pages, Sofia, 2021. (in Bulgarian).

For his participation in this competition for academic position, **Associate Professor Leoneed Mihaylov Kirilov** fulfills the requirement of Art. 29 (1) item 4, because he has presented a list of 18 more titles, of which 1 book chapter, 15 papers in journals and series, and 2 papers included in international conference proceedings.

From the analysis of the competition papers submitted by the applicant we can conclude that the peer-reviewed publications "do not repeat the ones submitted for the acquisition of the educational and scientific PhD degree and for the occupation of the

academic position Associate Professor”, in accordance with the requirements of Art. 29 (1), item 3 of the *Development of Academic Staff Act in the Republic of Bulgaria*.

For participation in the competition, **Associate Professor Leoneed Mihaylov Kirilov** has presented a list of 41 citations. It is important to note that publications have been noted, which have been indexed and referenced in Scopus and/or Web of Science editions, which also fulfills the specific conditions for acquiring academic degrees and occupying academic positions “Professor” in the Institute of Information and Communication Technologies - BAS.

Contributions to peer-reviewed works on the assumption of equal participation of the co-authors can be briefly presented in two groups, by accepting summary estimates according to the author's reference, classified in the following thematic scientific fields:

1. Modeling, development of optimization and decision-making algorithms for real processes and systems, [5, 8, 9, 13, 14, 15, 16, 17, 18, 19].
2. Modeling, development of optimization and decision-making algorithms for some classes of abstract tasks, [1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12].

The reviewer believes that it is definitely worth focusing on some of the contributions formulated by the applicant, such as:

1. A multi-criteria model with a finite number of alternatives for water quality management is proposed and a flood risk assessment model is made. It is built on the basis of logical rules (set by experts) and derivation of relevant alternatives for decision-making, [1].

2. The layer-by-layer growth process of a bimetallic Au-Ag (Gold-Silver) nanoparticle having a face-centered cubic and decahedral structure was investigated with a Monte Carlo method combined with a molecular dynamics approach. It was found that the order of addition of atoms (simultaneous or layered) affects the physicochemical arrangement in the studied gold-silver equiatomic nanoalloys, [4].

3. A combined method for the optimization of metallic nanostructures is proposed. The core of the method is a lattice Monte Carlo method with different grids combined with a molecular dynamics approach. Simulations have been made to study the size-,

composition- and temperature-dependent surface segregation behavior as well as the structural atomic instability of Au-Ag nanowires [12].

4. An engineering robust design approach using a multi-criteria approach in the decision phase is proposed. The approach is demonstrated by solving a real problem for a conceptual design of a bulk carrier, [8].

5. A generalized model for scalarization in solving multicriteria problems with continuous and/or integer variables is proposed. Thirteen well-known scalarization approaches (start point approach, reference direction approach, classification approach, etc.) are included in the (GENS) model [16].

6. A population-based interactive evolutionary algorithm (EVALIMCO) was proposed for solving multi-criteria optimization convex integer problems, [17].

7. A Web-based decision support system (WebOptim) was developed for solving multi-criteria optimization problems with continuous and/or integer variables, [19].

I accept the contributions formulated by the applicant in the works with which **Associate Professor Leoneed Mihaylov Kirilov** fulfills the requirement of Art. 29 (3), because he participates in the competition, the results being scientific, scientifically applied and applied in nature and can be defined as enrichment of an existing scientific field with new knowledge.

Associate Professor Leoneed Mihaylov Kirilov was a member of a team of 28 research and applied projects, and he was a leader of 5.

Associate Professor Leoneed Mihaylov Kirilov is a supervisor of one PhD student in the Institute of Information and Communication Technologies - BAS, which is successfully defended.

According to the information provided for the fulfillment of the minimum national requirements and the minimum requirements of Institute of Information and Communication Technologies - BAS by **Associate Professor Leoneed Mihaylov Kirilov**, he fully covers the minimum requirements for indicators A, C, D, E and E for the Scientific Field 4. Natural Sciences, Mathematics and Informatics, the Professional Area 4.6. Informatics and Computer Sciences, the Scientific Specialty Informatics.

I accept the Declaration submitted by the applicant that there is no legally proven plagiarism in the scientific works presented for this competition by **Associate Professor Leoneed Mihaylov Kirilov**, which fulfills the requirement of Art. 29 (1) item 6.

In conclusion, I agree that the requirements of the Law for the *Development of Academic Staff Act in the Republic of Bulgaria* and the specific requirements in the Act's Institutional Regulations for its implementation, the Rules for the conditions and the order for acquiring academic degrees and for the occupation of academic positions in the BAS and the Rules for the specific conditions for acquisition of academic degrees and occupation of academic positions at the Institute of Information and Communication Technologies - BAS are accomplished. After getting acquainted with the materials submitted by the applicant for the competition, I give my positive estimation about the choice of **Associate Professor Leoneed Mihaylov Kirilov** in the competition for the academic position of “**Professor**” for the needs of the Information Processes and Decision Support Systems Department at the Institute of Information and Communication Technologies - BAS, in the Scientific Field 4. Natural Sciences, Mathematics and Informatics, the Professional Area 4.6. Informatics and Computer Sciences, the Scientific Specialty Informatics.

I propose that the Scientific Jury unanimously vote for a proposal to the Scientific Council of the Institute of Information and Communication Technologies - BAS, to elect **Associate Professor Leoneed Mihaylov Kirilov** for the academic position of “**Professor**” in the Scientific Field 4. Natural Sciences, Mathematics and Informatics, the Professional Area 4.6. Informatics and Computer Sciences, the Scientific Specialty Informatics.

15.01.2025

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/Corr. Memb. Lyubka Doukovska, DSc/