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## DEFENCE INSTITUTE „PROFESSOR TSVETAN LAZAROV“

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### STANDPOINT

by Associate Professor Dr. Eng. Ivan Stefanov Hristozov,

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of the scientific papers submitted in the competition for the academic position of "Professor" for servicemen,  
in scientific field 5. Technical sciences,  
professional field 5.3. Communication and computer technology,  
in the scientific specialty "Information technologies and cyber security",

for the needs of the Defence Institute "Professor Tsvetan Lazarov", published in the State Gazette, 81/11.10.2022 in accordance with Order № OX-916 of 28.09.2022 of the Minister of Defense of the Republic of Bulgaria.

of the candidate Colonel Associate Professor Doctor engineer Nikolai Todorov Stoianov, deputy director of the Defense Institute "Professor Tsvetan Lazarov".

## **1. General characteristics of the research, scientific-applied and pedagogical activity of the candidate.**

In the current competition for the occupation of the academic position of "Professor" for a military serviceman, the only candidate is Colonel Associate Professor Doctor engineer Nikolai Todorov Stoianov.

According to the author's reference provided by Col. Associate Professor Dr. Stoianov, the list of his scientific production contains over 136 titles, of which he participated in the current competition with 48 scientific works (1 monograph, 1 chapter of a collective monograph, 3 published university textbooks, 1 study, (Appendix 2.II.1), and 41 publications in our and international publications (Appendix 2.II.2 and 2.II.3), published in the period 2011 - 2022.

Twenty-three of the publications submitted for review are in English, two in Ukrainian and the rest in Bulgarian.

The monograph is a summary of research related to CIS information security risk analysis and management, and the other papers submitted for review are in the area of information security approaches, models, and architectures; cryptographic methods and systems; cyber security and cyber defense.

The candidate is a participant in: 26 international projects, of which he is the coordinator of 4; in 4 national scientific projects (in one as leader) and a number of departmental projects. He is the supervisor of 7 doctoral students, 2 of whom have successfully defended their dissertation. He was chairman, deputy. chairman and member of organizing committees of a number of international scientific conferences. He participates in the editorial boards of 5 journals, of which he is the editor-in-chief - Journal of Defense & Security Technologies, and another is indexed in world-famous databases (Advances in Military Technology, ISSN1802-2308).

He is a member of a number of organizations such as the Union of Scientists in Bulgaria, the Union of Automation and Informatics, AFCEA Section Sofia, NATO Science and Technology Organization (National Board Member) and a member of the panel on Information technologies and systems, as well as in the European Defense Agency.

The provided materials correspond to the minimum scientometric indicators defined in the Regulations for the implementation of the Law on the development of the academic staff in the Republic of Bulgaria (LDASRB) for professional direction 5.3. Communication and computer technology.

All this allows the candidate to be characterized as a teacher, researcher and innovator in the professional direction of the competition.

## **2. Evaluation of the special preparation and activity of the candidate.**

Colonel Associate Professor Doctor Engineer Nikolai Todorov Stoianov has worked in the military, scientific and military-scientific field since 1997, mainly in specialized units and scientific institutes for the construction and development of information and communication systems and technologies for the needs of defense.

In 2004, Nikolai Stoianov obtained the educational and scientific degree

"Doctor" in the scientific specialty 02.21.07 "Automated systems for information processing and management" after defending a dissertation on the topic: "Models of protected interaction in computer systems for security and defense ". He graduated from the Rakovski National Defence College, majoring in "National Security and Defense", "Organization and Management of CIS in Operational-Tactical Formations" and "Strategic Management of the Defense and Armed Forces".

Since 2003, he has been an instructor at the CISCO Network Academy of the Defense Advanced Research Institute, holds certificates for Microsoft Share Point Portal Server 2003 administrator, information systems auditor and, since 2009, a gold certificate for high professional achievements as a systems engineer, security administrator and designer of the Automated Control System.

Since 2014, he has been an associate professor at the Defense Institute, and currently its deputy director.

I have known Nikolai Stoianov since 1999. The impressions I have of his work as a teacher, researcher and excellent professional give me reason to assert that the candidate has the necessary special training in the field of the competition.

### **3. Main scientific results and contributions.**

I define the essence of the obtained results and contributions of colonel associate professor doctor Stoianov, as enrichment of existing knowledge and application of scientific achievements in practice.

The main contributions in the direction "Approaches, models, architectures, research and good practices in the field of information protection" are:

- approaches for risk management, testing and assessment of information security in computer systems are proposed (monograph II.1.6);
- theoretical statements for protection of information, computer networks and approaches for testing and analysis of the security of computer systems have been developed (textbooks II.1.3, II.1.4, II.1.8 and publication II.3.79);
- the problems were analyzed and the models for information protection in cloud architectures were studied (II.3.71, II.3.88);
- the possibilities for protecting information in the environments of police authorities (II.3.75), of state administration (II.1.5), in systems used by law enforcement authorities (II.3.80, II.3.82) and sensor systems in buildings ( II.3.90, II.3.94) have been analysed;
- a methodology for assessing the vulnerability of computer networks and a comparative assessment of scanners for automated assessment of these vulnerabilities is proposed (II.3.79).

In the direction "Cryptographic methods and mechanisms", the main contributions and results are:

- The directions for the development of post-quantum cryptography are clarified (II.3.70) and research related to the creation of new approaches for generating cryptographic keys that are resistant to calculations with quantum computers is presented (II.3.72, II.3.100, II.3.105).

The main results in the "Cyber Security and Cyber Defense" direction are grouped into several directions:

1) approaches to the design and construction of various cyber security architectures: the main concepts in cyber security architecture, its elements and technological aspects are systematized (II.2.11); cyber security metrics are defined (II.2.12); the technological and functional components of a multi-layer model for cyber security (II.3.76) and its application in critical information infrastructures (II.3.92, II.3.93) are discussed; an architecture for management of research in the field of cyber security in Bulgaria is presented (II.3.95);

2) analysis and assessment of cyber security of critical infrastructure systems: the main types of critical infrastructures are defined from the point of view of cyber security (II.3.85); a model for assessing cyber security of critical infrastructures (II.3.89) and a multi-layered model for their protection (II.3.92) are proposed.

3) systematization of knowledge about the approaches used for: analysis and assessment of cyber security at different levels (strategic, operational and tactical) (II.1.5, II.1.7, II.3.86, II.3.87, II.3.99) and of technological capabilities for conducting cyber operations (II.3.77). Approaches to prioritizing national interests over the European Union (II.3.103) and to assessing the impact of technological innovations on defense strategy (II.3.104) are presented, which could find application in cyber security assessment.

4) Developed approaches for: collective protection of corporate networks by introducing surveillance systems for threats and intelligence activities in the global information space (II.3.96); for mathematical assessment of the state of the system to be protected (II.3.98); to improve the protection of cyber-bio-cognitive-physical systems (II.3.99); for cybersecurity opportunity analysis focused on the development of a new risk assessment and management framework (II.3.101); to assess the cyber risk arising from cross-sector and multi-sector interdependencies (II.3.107); to support the identification and development of cyber attack scenarios (II.3.110). A cyber attack modeling language CySeMol (II.3.84) is described.

5) cyber security research in emerging system concepts and technologies - Internet of Things (II.3.83); Internet of Military Things (II.3.91); Blockchain Based Distributed Intrusion Detecting System (II.3.102) and for cyber defense, by means of situational awareness, regarding the dissemination of malicious information (II.3.106, II.3.109).

The received scientific and scientific-applied contributions have been approved in a number of departmental, national and international projects (Appendix 2, section II.4).

Of the 48 publications submitted for review, of which two are monographs, the candidate is the sole author of three, 17 are co-authored with one co-author, and in 8 he is in first place, which confirms his personal contribution.

In the process of my work as a member of the scientific jury, no non-anonymous and motivated written signal was received to establish plagiarism in

the monographs and other publications of the candidate for the competition.

#### **4. Evaluation of the significance of the contributions for science and practice.**

The analysis of the results and contributions of Col. Associate Professor, Doctor Eng. Nikolai Stoianov shows the professional knowledge of the problems and the appropriate combination of teaching and research activities with implementation activities, which leads to concrete and practical solutions. The candidate demonstrated his high scientific training, knowledge and skills in 26 international (of which 13 under the competition), 4 national and a number of departmental scientific projects.

Seven of the publications are in publications indexed in world-renowned databases.

The candidate has proven a total of 56 citations, in which the results of the materials proposed for review found a place. Of these, 26 are in scientific publications, referenced and indexed in world-renowned databases with scientific information, 30 are in monographs and collective volumes with scientific review.

#### **5. Critical notes on peer-reviewed works.**

I have no particular critical remarks about the scientific works submitted for review. They clearly state the statements, the goals, formulate the tasks and define the framework of the research. Through the results summarized in conclusions, new facts are obtained and proven or existing ones are confirmed.

#### **6. Conclusion.**

Bearing in mind the overall scientific research and implementation activity of the candidate and the positive evaluation of his contributions and results, I consider that the only participant in the competition, Col. Associate professor Dr. Nikolai Todorov Stoianov, fully meets the requirements of LDASRB in the Republic of Bulgaria, the Regulations for its implementation and the Regulations on the terms and conditions for occupying academic positions at the Defense Institute "Professor Tsvetan Lazarov".

I propose to the respected members of the scientific jury to vote for awarding the academic position of "professor" to Col. Associate professor Doctor Eng. Nikolai Todorov Stoianov in the field of higher education 5. Technical sciences, professional direction 5.3. Communication and computer technology, scientific specialty "Information technologies and cyber security"

#### **7. Evaluation of candidates.**

In view of the above, I give a positive assessment to the only candidate in the competition, Col. Associate professor Doctor Eng. Nikolai Todorov Stoianov.

Date  
23.01.2023

Member of the jury  
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*(Associate professor Doctor Eng. Ivan Hristozov)*