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DEFENCE INSTITUTE „PROFESSOR TSVETAN LAZAROV“

STANDPOINT

by Associate Professor Eng. Ivan Stefanov Hristozov, PhD

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of the scientific papers submitted in the competition for the academic position of

"Associate Professor" for a military serviceman,

in scientific field 5. Technical sciences,

professional field 5.3. Communication and computer technology,

in the scientific specialty "Radio transmitting and receiving equipment"

for the needs of the Research Department "Communication Networks and
Systems" of the Directorate "Development of C4I Systems" at the Defence
Institute "Professor Tsvetan Lazarov", published in the State Gazette, issue
29/04.04.2025 in compliance with Order № 293 of 25.03.2025 of the
Minister of Defense of the Republic of Bulgaria.

of the candidate Colonel Eng. Ivan Penchev Ivanov, PhD, Director of the "C4I
Systems Development" Directorate at the "Professor Tsvetan Lazarov"
Defense Institute.

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

In the current competition for the academic position of "Associate professor" for a military serviceman, the only candidate is Colonel Eng Ivan Penchev Ivanov, PhD.

According to the author's reference provided by Colonel Penchev, PhD the list of his scientific production contains over 39 titles, of which he participated in the current competition with 25 scientific papers (1 monograph (Appendix II.1.1) and 24 articles/reports in domestic and international publications, published in the period 2008 - 2025.

The scientific research activity of Col. Ivan P. Ivanov, PhD is in the professional field and scientific specialty in which the competition is held.

The monograph (II.1.1) is a summary of the research related to the concept of a software-defined radio station (SDR). In it, based on the functional block diagram of a radio communication system (RCS) and subsequent modeling and simulation of the individual blocks, a complete model of such a system is reached using the SDR concept. Practical technical implementations of software-defined elements of radio communication systems have been proposed and tested.

The remaining scientific works examine problems related to field communication and information systems, modern communication systems and technologies, military cellular networks and systems, software-defined radio stations, sensor networks, etc.

The candidate is a participant in 2 international (II.3.1 and II.3.2), one national and many departmental projects related to the construction of radio communication networks and systems, automated information systems and control systems.

In the period 2012 - 2023, he is a national representative in the "System Concepts and Integration" panel of the NATO Science and Technology Organization.

As can be seen from the submitted reference/self-assessment for fulfilling the minimum national requirements for a competition announced in the "State Gazette" (issue 29/04.04.2025) for the academic position of "Associate professor", the materials provided exceed the minimum scientometric indicators set out in the Regulations for the Implementation of the LDASRB for professional field 5.3. Communication and Computer Engineering (with a required 400, he has 703 points).

All this allows the candidate to be characterized as a researcher and implementer in the professional field of the competition.

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

Colonel Eng. Ivan Penchev Ivanov, PhD has been working in the military, scientific and military-scientific field since 1993, mainly in specialized units and

scientific institutes for the construction and development of communication systems and technologies for the needs of defense.

In 2004, Ivan Penchev Ivanov obtained the educational and scientific degree "Doctor" in the scientific specialty 02.07.04 "Radio transmitting and receiving equipment" after defending a dissertation on the topic: "Research of a radio communication system for high-speed data transmission in mobile networks with military purposes". He graduated from the "G.S. Rakovski" Military Academy, specialty "Organization and management of CIS in operational-tactical formations".

He held positions as a research associate at the Military Scientific and Technical Institute, assistant head of a department in the Office of the General Designer of the CAS, head of the "Communication Networks and Systems" department at the Defense Institute. He provided scientific support in the management of the life cycle of products and systems - radio relay station "Hemus", data transmission equipment for ASUOADN "Vulkan-S", data transmission equipment for ASU "Range", radio station for aviation "Brashlyan", chemical situation information exchange system "Kamchia", etc. He is a participant in program teams for the implementation of projects for the modernization of BA - "PIKIS of the 61st mechanized brigade", "Automated network for communication with mobile objects according to the TETRA standard", etc.

Currently (2025) he holds the position of Director of the "Development of C4I Systems" Directorate at the "Professor Tsvetan Lazarov" Defense Institute.

I have known Ivan P. Ivanov, PhD since 1999. The impressions I have of his work as a researcher and excellent professional give me reason to assert that the candidate possesses 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 Col. Ivan P. Ivanov, PhD as enrichment of existing knowledge and application of scientific achievements in practice in three main directions.

The main contributions in the direction "**Architectures, models, design and prototyping of software-defined, cognitive radio stations and radio systems**" are:

- the paradigms for SDR and cognitive radio station [II.1.1, II.2.2] are analyzed and improved architectures for their implementation are proposed, using cognitive machines [II.2.2], cloud technologies [II.2.11, II.2.17, II.2.19], polyphase filtration/synthesis [II.2.18] and a controllable communication environment [II.2.21];

- the proposed architectures have been tested through modeling, design and prototyping [II.1.1, II.2.2, II.2.4, II.2.18, II.2.21, II.2.23, II.2.31]. Experimental data on the quality of the radio channel have been obtained [II.2.31]

- A multifunctional radio-technical system for communication and electronic

warfare based on SDR has been proposed [II.2.23].

In the direction **"Prospects, architectures, prototypes in improving communication and information systems and technologies"** the main contributions and results are:

- an analysis of promising technologies for communication and information systems for security and defense purposes has been made [II.2.3, II.2.6, II.2.8];
- hybrid architectural solutions of cloud technologies applicable for military purposes have been proposed [II.2.10, II.2.12, II.2.14];
- results of using a departmental cellular system according to the TETRA standard are presented and a proposal for its future development is made [II.2.1].
- a solution for using the "augmented reality" technology in visualization of cellular network coverage is proposed and prototyped [II.2.5].
- a model of data structures and an algorithm for generating an information frame when registering flight information of aircraft are developed [II.2.13].
- current cyber risks at sea are analyzed [II.2.15], with a specific focus on cruise ships.

The main results in the direction **"Prospects, architectures and improvement of software-defined active and passive radar systems"** are grouped into several directions:

- an analysis of promising technologies for building radar systems is presented [II.2.15] and the role of software-defined radio platforms in the development of promising radars is revealed [II.2.9];
- passive single-band and dual-band radar architectures using DVB-T and LTE signals have been proposed and the possibilities for monitoring and security of the dual-band architecture using the software-defined platform USRP [II.2.16 II.2.20] have been studied.

The received scientific and applied scientific contributions have been tested in a number of departmental projects, the national project "Security and Defense" and two international projects (II.3.1 and II.3.2).

Three of the publications submitted for review are in English, the rest are in Bulgarian. In 10 of the publications, the candidate is the sole author, the rest are co-authored, and in three of them 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 has been received for the establishment of plagiarism in the monograph and other publications of the candidate in the competition.

4. Assessment of the significance of contributions to science and practice.

The analysis of the results and contributions of Col. Eng. Ivan P. Ivanov, PhD shows the professional knowledge of the problems and the appropriate combination of scientific research and implementation activities, which leads to

concrete and useful solutions for practice.

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

The candidate has proven a total of 38 citations, in which results from the materials proposed for review have found a place. Of these, 12 are in scientific publications, referenced and indexed in world-renowned databases with scientific information, 26 are in monographs and collective volumes with scientific review.

5. Critical remarks on peer-reviewed papers.

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

6. Conclusion.

Considering the overall scientific research and implementation activity of the candidate and the positive assessment of his contributions and results, I believe that the only participant in the competition, Col. Ivan Penchev Ivanov, PhD fully meets the requirements of the LDAS in the Republic of Bulgaria, the Regulations for its implementation and the Regulations for the terms and procedures for holding academic positions at the Institute of Defense "Professor Tsvetan Lazarov".

I propose to the esteemed members of the scientific jury to vote for awarding the academic position of "Associate professor" to Col. Eng. Ivan Penchev Ivanov, PhD in the field of higher education 5. Technical sciences, professional field 5.3. Communication and computer technology, scientific specialty "Radio transmitting and receiving equipment"

7. Evaluation of the candidates.

In view of the above, I give a **positive assessment** to the only candidate in the competition, Col. Eng. Ivan Penchev Ivanov, PhD.

Date
18.06.2025 г.

Member of the jury

(Assoc. Prof. Dr. Eng Ivan Hristozov)