

## STATEMENT

For the competition for occupation of the academic position "associate professor" specialty "Communication Networks and Systems", professional field 5.3. "Communication and computer equipment", declared in the State Gazette №. 45 of 28.05.2021 for the needs of a section "Distributed information and management systems" of IICT-BAS candidate: Dr. Vladimir Nikolaev Ivanov  
Member of the Scientific Jury: Prof. Dr. Dimitar Nedelchev Karastoyanov  
Ground for the opinion: Order of the Director of IICT-BAS No. 178/ 16.07.2021.

### 1. General and biographical data

The only candidate in the competition is Dr. Vladimir Nikolaev Ivanov. He was born on September 11, 1982 in the city of Sofia. He graduated from the University of Chemical Technology - Sofia in 2008 as an engineer (master) in "Automation and Information Technology". He defended his doctoral dissertation in 2015 at the Institute of Information and Communication Technologies - BAS on the topic "Development of software for modeling multifunctional electronic circuits.". From 2015 until now is assistant prof. at IICT-BAS. The professional and organizational activity of the candidate is determined by the fact that from 2015 until now Dr. Ivanov has co-authored 1 monograph and 23 publications on the topic of the competition, of which 7 are SCOPUS referenced and 6 of the publications are with SJR. There are 11 citations in referenced publications and 5 in non-referenced ones. He has participated in 7 research projects (1 European and 6 national), of which he has led 2. The competition for "Associate Professor" was announced by the Scientific Council of IICT-BAS, for the needs of the Section "Distributed Information and Management Systems" - State Gazette, issue. 45 of 28.05.2021

### 2. General description of the presented materials

In the competition for "associate professor" Dr. Vladimir Nikolaev Ivanov participates with a list of 1 scientific work of a monographic nature. The work is in the field of "Management of transport systems and processes", Avangard Prima Publishing House, Sofia, 2021, pp. 210, ISBN 978619239527-8.

A list of 23 publications other than the one with a monographic character is also presented. 7 of them are articles in publications that are referenced and indexed in the world-famous database of scientific information - Scopus. 2 of them have 2 co-authors, 1 has 3 co-authors and in 2 he is single author. The remaining 16 are presented as in unrefereed journals or in edited collective volumes. 6 of the publications with the participation of Dr. Ivanov are with SJR.

A list with a total of 11 citations of a total of 3 articles is given. The citations are in editions, referenced and indexed in a world-famous database with scientific information - Scopus. 5 citations in unrefereed publications are also given.

The applicant has also submitted a list of 7 projects in won competitions with his participation as a member of the team: 1 under the European project ACOMIN, 2 contracts with NSF, 2 contracts with BAS, 1 under Operational Program and 1 contract with Sozopol municipality, in 2 of which Dr. Ivanov is the leader.

**The structural characterization of scientific publications justifies the following conclusions and assessments:**

- *The candidate participates in the competition for associate professor with sufficient number of publications, fulfilling the requirements of the law and additional requirements of IICT-BAS.*

- *The submitted works are devoted to scientific and applied problems in the field of the announced competition.*
- *There are both independent and co-written scientific papers, which show the ability to work in a team as well as independently.*

### **3. A general characteristic of the applicant's research and scientific and applied activities**

From the presented publication with a monographic character and 7 + 16 other articles / reports Dr. Vladimir Ivanov is an independent author in the monographic work, in 2 of the referenced publications and in 10 of the non-referenced ones. The publications are on the topic of the competition. The articles and reports address the following groups of issues:

1. The presented monographic work is scientific and thematic in the field of Management of transport systems and processes.
2. The presented outside the monographic work a total of 7 refereed publications are divided thematically similarly into the following more important scientific directions:
  - Traffic management, intelligent transport systems - № G1, G3, G6;
  - Hardware devices, detectors and regulators - № G2, G7;
  - Video systems - № G5.
3. The unreferred 16 publications are in the fields of hardware and software modules, embedded microprocessor systems, research and management of transport traffic.

### **4. Scientific-research and applied contributions of the applicant**

I find several groups of contributions in different fields to be well-founded, substantiated and confirmed by the scientific works (monograph, articles and reports) with which the candidate participates in the competition for "associate professor".

#### **A. Monographic work (+ partially in G7.5, G7.7 and G8.7, G8.12):**

1. Proposed approaches for creation of new methods and means for data and signal processing with applications in management of transport systems and flows.
2. An algorithm has been developed for detection of mobile objects and assessment of their parameters through video surveillance, as well as an approach for optimization of transport traffic in order to reduce environmental pollution in urban conditions by optimizing traffic lights.
3. A methodology for building modern high-performance information systems and devices for calculating the moving average, PID controller and signal processing from pulsars, implemented on a modern FPGA element base, is presented.

#### **B. Referenced publications outside the monograph:**

1. Proposed method for optimization of transport flow for urban traffic management based on optimization formal description of the control through two-stage optimization - G7.3.
2. Developed traffic light based on PicoBlaze microprocessor, built into FPGA Spartan 6, for the purposes of traffic flow management - G7.1.
3. Optimized time shifts for the "green" signal, leading to improved traffic performance - queues, speed and travel time - G7.6.
4. Proposed innovative approach for processing of loud noise signals from pulsars - G7.7.
5. Simulation and hardware implementations of the methods for calculating the moving average and PID controller, based on the module for digital signal processing DSP48A1, built into the structure of the FPGA from the Spartan 6 series of Xilinx - G7.2, G7.4.

#### **C. Unreferenced publications outside the monograph:**

1. The coordination and optimal management of transport flows on the road network - G8.4, G8.6, G8.7, D8.8, G8.9 and G8.11.
2. Design and implementation of devices related to the construction of transport management systems - G8.1, G8.2, G8.3, G8.5, G8.10, G8.12 - G8.16.

I consider the contributions to be mainly of a scientific - applied nature. There are scientific and / or applied elements in separate contributions.  
I evaluate the candidate's contributions positively and as corresponding to the requirements of the normative documents under this item.

#### **5. Significance of contributions to science and practice**

The presented scientific and applied contributions of the candidate have a great social significance. The developed, researched and simulated hardware and software for traffic monitoring and management are important for the development and enrichment of the theory and practice of transport systems.

In addition to the monographic book, Dr. Vladimir Ivanov presented 7 + 16 other articles / reports. Lists of 16 citations are presented. That is why it can be considered that the contributions of Dr. Vladimir Ivanov have gained the necessary fame in the scientific community at home and abroad.

#### **6. Critical remarks and recommendations**

I have no critical remarks with which to challenge the main scientific and applied contributions of the candidate. The high level of some of the obtained results has enabled their publication and citation in SJR publications.

Critical remarks can be made about some omissions in the design of several publications, as well as in the design of the entire material.

In summary, the most significant gaps in the materials for participation in the competition are:

- The problems and the results of the list of projects by won competitions with the participation of Dr. Ivanov as a member and leader of the teams are not described in detail,
- It would be good to protect some of the scientific and applied solutions and results achieved with patent applications,

Despite the critical remarks and omissions (which are not essential for the overall assessment), I believe that the formulated decisions and contributions are proof that the candidate is fully prepared for the academic position of "associate professor".

### **CONCLUSION**

I believe that in terms of volume and quality, the applicant's research and application activities **satisfy the requirements of the Law and Regulations ZRASRB and PPRASRB**. The quantitative indicators of the IICT-BAS Regulations for the occupation of the academic position of Associate Professor are covered, most of which are exceeded. Therefore, I give my positive vote for the academic position of "Associate Professor" by Dr. Vladimir Nikolaev Ivanov.

**The application complies with the requirements of the ZRASRB, RAPRASRB and other internal normative documents. This gives me the conviction to propose to the Honorable Members of the Scientific Jury to vote for the assignment of Dr. Vladimir Nikolaev Ivanov to the academic position of Associate Professor in the specialty "Communication networks and systems", professional field 5.3. Communication and computer equipment.**

19<sup>th</sup> August, 2021  
Sofia

Member of the Scientific Jury: .....  
(Prof. Dr. *Dimitar Karastoyanov*)

