

## REVIEW

**By Prof. Magdalena Zlatkova Garvanova, PhD**

University of Library Studies and Information Technologies

PF 4.6 “Informatics and Computer Sciences”

### About:

contest for a **professor** in the field of higher education 4. Natural Sciences, Mathematics and Informatics, professional field 4.6 “Informatics and Computer Sciences”, scientific specialty “Informatics”, announced by the University of Economics – Varna

### 1. Information about the contest

The contest was announced in SG No. 2 dated 05.01.2024 for the needs of the “Informatics” Department at the “Informatics” Faculty of the University of Economics – Varna. I participate in the composition of the scientific jury for the contest according to Order No. RD-06-33/27.02.2024 of the Rector of the University of Economics – Varna. At the first meeting of the scientific jury, held on 13.03.2024, I was chosen to prepare a review. As a result of the contest, I received a complete set of documents electronically.

### 2. Contest candidate

The only candidate, who submitted documents for participation in the contest, was **Assoc. Prof. DSc. Pavel Stoyanov Petrov**, who is a Doctor of Sciences in PF 4.6 “Informatics and Computer Sciences” from 22.03.2022, certified by a diploma issued by the University of Library Studies and Information Technologies with number 0529. Since 17.06.2011 he is an Associate Professor in PF 4.6 “Informatics and Computer Sciences” with a decision of the FC of the FI of

the University of Economics – Varna, possessing a certificate for Associate Professor No. D005/16.12.2011. Assoc. Prof. DSc Pavel Petrov has proven all his scientific degrees and positions in the NACID system. It can be seen from NACID that he obtained the educational and scientific degree “Doctor” in PF 3.8 Economics, specialty “Application of Computing Technology in the Economy” with a diploma issued by VAK with No. 28474 dated 19.05.2003.

### **3. Personal characteristics of the candidate**

Personal characteristics of the candidate Assoc. Prof. DSc Pavel Stoyanov Petrov has been working at the University of Economics – Varna since 2001, when he was appointed to the position of “Assistant” and at the same time he is a doctoral student at the same university. After the defence of his PhD thesis, he became a “Chief Assistant” at the University, and this continued for seven years until 2011, when he acquired the academic position “Associate Professor” in PF 4.6 “Informatics and Computer Sciences”.

I have the pleasure of knowing Assoc. Prof. DSc Pavel Petrov for about 10 years. We have no joint publications. During this period, I have repeatedly had the opportunity to convince myself of his ability to generate new ideas and implement them in practice. He possesses high professionalism in the field in which he works and is a well-known and respected scientist both in the country and abroad.

### **4. Fulfilment of the requirements for occupying the academic position**

The candidate Assoc. Prof. DSc Pavel Petrov fulfils the minimum national requirements for occupying the academic position “Professor” in professional field 4.6 “Informatics and Computer Sciences”, according to the Law on the Development of the Academic Staff of the Republic of Bulgaria (LDASRB) and the Regulations for its Application (RALDASRB).

The candidate under the procedure holds “Doctor” and “Doctor of Sciences”, thereby fulfilling Art. 29 (1) point 1 of the LDASRB and covers indicator A of the

RALDASRB.

Assoc. Prof. DSc Pavel Petrov meets all requirements to Art. 29 (1) point 2, as he held the academic position of “Associate Professor” in the same higher education institution from 2011 to the present, which is much more than the required two years in the law.

It corresponds to Art. 29 (1) point 3, since he presented a monographic work on the topic: “Algorithmic Approaches in Coding Geospatial Data”, with a volume of 199 pages, which fulfils the requirements of indicator C.

The candidate complies with Art. 29 (1) point 4, as he has also provided other original scientific research works, thereby fulfilling the requirements of indicator D. He provided 25 scientific publications that are referenced and indexed in Web of Science and Scopus, as well as 6 chapters of 3 books.

The scientific works presented in the contest were not used by the candidate in previous procedures for acquiring the ESD “Doctor”, SD “Doctor of Sciences” and for obtaining the AP “Associate Professor”.

Assoc. Prof. DSc Pavel Petrov responds to Art. 29 (1) point 5, as it fulfils the minimum national requirements under Art. 2b, para. 2 and 3, respectively, to the requirements under Art. 2b, para. 5.

The candidate complies with Art. 29 (1) point 6, since there is no proven plagiarism or unreliability of the scientific data presented in the scientific works. As a confirmation of this statement, a reference was prepared for 55 citations of 15 scientific publications, which fulfils an indicator from group D.

Indicators from group E are covered by provided references for the acquired scientific degree “Doctor of Sciences”, an advisor of a successfully defended doctoral student, 8 participations in national scientific research projects, 7 coordinations of national scientific or educational projects, 4 textbooks and 2 teaching manuals.

The contest candidate fulfils the minimum national requirements for “Professor” in the Field 4. Natural Sciences, Mathematics and Informatics, PF 4.6 “Informatics and Computer Sciences”, as shown in the table below:

<b>A group of metrics</b>	<b>Content</b>	<b>Professor</b>	<b>Assoc. Prof. DSc Eng. Pavel Stoyanov Petrov</b>
<b>A</b>	Indicator 1	50	<b>50</b>
	Indicator 2	--	--
<b>B</b>	Indicators 3 or 4	100	<b>100</b>
<b>G</b>	Sum of indicators from 5 to 10	200	<b>840</b>
<b>D</b>	Sum of points in indicator 11	100	<b>440</b>
<b>E</b>	Sum of the indicators from 12 to the end	100 for PF 4.6	<b>460</b>
<b>Total:</b>		550	<b>1890</b>

A reference from Scopus, Web of Science, Google Scholar and ResearchGate up to 04/15/2024 shows the following scientometric indicators:

**Scopus:** H-index 6, articles 41, citations 142

**Web of Science:** H-index 3, articles 16, citations 22

**Google Scholar:** H-index 11, citations 379

**ResearchGate:** H-index 8, citations 201

The analysis shows that Assoc. Prof. DSc Pavel Petrov fulfils the minimum national requirements for “Professor” in PF 4.6 “Informatics and Computer Sciences”.

## **5. Evaluation of teaching-educational activities**

The candidate reads lectures at the University of Economics – Varna in 13 disciplines, as follows: bachelor's degree – Informatics, Object-Oriented Programming, Visual Programming with Java, Computer Graphics, Server Programming. In master's degree – Electronic Business, Server MVC Programming, Web Applications with Node.js, Real-Time Web Technologies, Object-Oriented Programming (English), Server Programming (English), Visual Programming with Java (English). For Erasmus students, he reads Foundations of Object-Oriented Programming. The candidate participated in two Erasmus+ mobilities: University of Limerick, Ireland (April 2017) and Altonbas University, Turkey (May 2019).

He is the supervisor of 1 successfully defended doctoral student, as well as 2 dismissed ones with the right to defend and 2 in the process of learning. He is the supervisor of 18 successfully completed students in bachelor's and master's degrees. He is a member of the Union of Scientists in Varna, chairman of the Control Board with a mandate of 2021-2025, previously: STU, UMB, vice-chairman of the "Economic Sciences" section of the Union of Scientists – Varna, mandate of 2016-2023. He is a member of the Faculty Council of the Faculty of Informatics at UE – Varna. He is a member of the attestation commission at the Faculty of Informatics at UE – Varna. He is a member of the State Examination Commission at the "Informatics" Department. He is a member of organizing committees of Bulgarian and foreign scientific conferences. Participant in scientific juries for dissertation defences and for holding academic positions. Participant in working groups for the preparation of project proposals. He is a member of editorial boards of Bulgarian and international journals. He was the head of the "Information Technologies and Services" Department, UE – Varna in 2010-2011. He participated in an international ecological expedition "Save the Arctic" in Alaska, USA at the invitation of Greenpeace Intl. in the period May-August 2012.

He participated in an international humanitarian mission in the city of Tamatave, Republic of Madagascar at the invitation of US MercyShips in the period April-June 2015. He participated as an evaluator for the “Scientific Research” Fund and many others.

## **6. Characteristics of the presented scientific works**

The candidate’s scientific works are in the field of the announced contest, but the wide range of scientific interests in which he actively participates makes a very good impression. His knowledge of mathematics and informatics is fundamental and can be seen in all the scientific publications applied to the contest.

In the habilitation work (monograph No. 1), the main geocoding systems used in practice were analysed. The wide variety of devices generating geospatial data in these systems allows extracting valuable information, but this in turn requires serious technological resources to store, transfer and process large arrays of signals and data. The monograph examines new algorithmic approaches to improve the widely used Geohash system. A simplified unit testing approach using input bounds is developed to investigate outliers in geohash code computation. A thorough empirical study was conducted and it was concluded that only a small fraction of the tested implementations written in JavaScript, which are publicly available and highly popular on github.org, return the expected geocodes matching exactly or with greater accuracy from the references. This makes it necessary to conduct unit testing before using such program libraries in real projects. The monograph developed a new approach to find only one symbol of the geohash code without having to calculate the remaining bits or symbols and called the “rasterizing algorithm”. By using it, it is possible to quickly find both an arbitrary symbol of the geocode and only a part of the symbols. In this way, a combination of textual location description and geohash suffix can be effectively implemented,

omitting the first few characters of the geohash string, similar to shortcodes in other geocoding systems.

The monograph also develops a new approach for applying isoplanar tessellation to geohash, making it easier to compare data between cells of different latitudes; simplifying the process of data visualization on an online map when creating the so-called “heat maps”; facilitating statistical analysis of data, etc. Software modules have been developed for encoding and decoding geohash codes using the rasterization algorithm, to be implemented in relational database management systems, as well as to be used to accelerate the processing of Big data and in web applications. Some of these studies have also been published in [11, 38, 46, 62, 69, 72, 75].

In articles [22, 24, 25, 32, 37, 55, 57, 58, 64, 65], problems related to the activity of start-up companies with the subject of activity of the development of a new software product were studied.

In publications [6, 12, 17, 35, 42, 43, 45], the possibilities of application of new protocols and approaches in the creation of server web applications operating in real-time mode and in the field of storage have been investigated and analysed data.

In articles [20, 33, 53, 59, 60, 61, 63, 67, 68], the possibilities of decoding and classification of brain signals were studied to implement a direct one-way connection (interface) between the human brain and the computer.

In publications [5, 10, 31, 34, 36, 56], the processes of digitization of educational services have been studied and analysed. Methodologies for determining the level of digitization reached, infrastructure capacity planning, administration of database management systems are proposed.

In publications [2, 8, 19, 21, 39, 40, 44, 50, 52, 54, 73], the trends and regularities in the technologies used for digitization of the banking sector, as well

as some problems related to information security, have been studied.

Publications [4, 7, 23, 26, 27, 28, 74] have analysed the possibilities of applying innovative technologies in processing Big data in construction, logistics and maritime transport. Basic principles for building applications using the so-called “free software” for Big data processing.

Publications [3, 9, 13, 16, 48, 49] defined the scope of the term “social business analytics” with significance in the field of marketing and proposed approaches suitable for application in the so-called “social media”. Approaches have been developed for full-text search, classification, faceted search, which can be used in various information systems to help find relevant information on given topics.

To improve the quality of students’ education and its provision with study materials, textbooks, study aids, guides and support materials that can be used in the disciplines of Server Programming [41, 79] have been developed and published; Real-time web technologies [14, 15, 77]; Object-oriented programming [76, 78, 80]; Informatics [81].

## **7. Evaluation of the candidate’s contributions**

The candidate’s contributions have a scientific and scientific-applied nature, confirming some known facts, enriching the existing scientific field with new knowledge and offering opportunities to implement the obtained results in practice.

The contributions are in the field of geocoding systems and more specifically in the encoding and decoding of geohash codes, the activities of start-up companies with a subject of activity the development of a new software product, the application of new protocols and approaches in the creation of server web applications, in educational services, in digitalization of the banking sector, as well as innovative technologies for the processing of Big data. In these prospective



scientific directions, the candidate has a contribution to the development and research of methods, algorithms, and programs.

### 8. Remarks and recommendations

I have no critical remarks, but rather a recommendation to Assoc. Prof. DSc Pavel Petrov to continue to publish the results of his research activities in prestigious publications indexed in the world databases with scientific information Scopus and Web of Science. I take the liberty of recommending him to be the supervisor of more doctoral students, to pass on his rich scientific and teaching experience to the next generation of Bulgarian lecturers and researchers.

### 9. Conclusion

On the basis of the outstanding scientific contributions of the candidate, I believe that all the requirements and criteria of the Law on the Development of the Academic Staff of the Republic of Bulgaria, the Regulations for its Application and the specific criteria of the University of Economics – Varna have been met and I give a fully convinced *positive assessment* for the selection of Assoc. Prof. DSc Pavel Stoyanov Petrov for the academic position of “Professor” in professional field 4.6 “Informatics and Computer Sciences”.

I propose to the respected scientific jury to support the candidate and vote a proposal to the Faculty Council of the Faculty of Informatics of the University of Economics – Varna to elect **Assoc. Prof. DSc Pavel Stoyanov Petrov** for the academic position of “Professor” in professional field 4.6 “Informatics and Computer Sciences” (Informatics) for the needs of the University of Economics – Varna.

22.04.2024

Sofia

Signature:

Заличена информация съгласно  
ЗЗЛД и регламент (ЕС) 2016/ 679

/Prof. Magdalena Garvanova, PhD/



ИКОНОМИЧЕСКИ УНИВЕРСИТЕТ ВАРНА

Вх. № 220-580 / 18.04.2024

## REVIEW

**on a competition for professor** in the field of higher education 4. Natural sciences, mathematics and informatics; professional field 4.6 Informatics and Computer Science; scientific specialty "Informatics"; announced in State Gazette issue 2 / 05.01.2024 for the needs of the University of Economics – Varna, Department of Informatics with single candidate Assoc. Prof. Pavel Stoyanov Petrov, D. Sc..

**Reviewer: Prof. Vladimir Sulov, PhD,**  
from the University of Economics – Varna,  
member of the scientific jury of the competition according to order RD 06-33 / 27.02.2024 of the Vice-Rector of the University of Economics – Varna and elected as a reviewer at a jury meeting held on 13.03.2024.

### I. Personal characteristics of the applicant

The candidate in the competition Pavel Stoyanov Petrov was born in Varna. He graduated from the Second High School of Mathematics – Varna in 1988, and in 1996-1997 graduated with a bachelor's and master's degree at the University of Economics – Varna, majoring in Economic Informatics.

In the period 1994 – 2001 he worked in various positions in the field of publishing. In 1998 he was enrolled in doctoral studies and in 2001 he entered as an assistant professor at the Department of Informatics at the University of Economics – Varna. In 2003 he defended his dissertation for PhD on "Complex



Information Systems for Management of Production Enterprises". In 2004 he was elected Chief Assistant Professor and in 2011 he won a competition for Associate Professor. In 2022, he defended his dissertation for "Doctor of Science" on "Security and Productivity in the Digitalization of Financial Services".

## II. Research and contributions of the applicant

In the competition for professor Assoc. Prof. Pavel Petrov, D.Sc. presents himself with a total of 75 scientific publications, including:

- 1 single author monograph (habilitation work), another single author monograph and participation in 3 collective;
- 6 studies, of which 2 single author;
- 27 articles, of which 4 single author;
- 37 reports, of which 13 single author.

In addition to scientific publications, the candidate has participated in 6 textbooks and teaching aids.

*The main monographic work* of Assoc. Prof. Pavel Petrov, D.Sc. "Algorithmic Approaches in Geospatial Data Coding" has a volume of 196 pages, including an introduction, 5 chapters, conclusion, annexes, a list of used literature from 152 sources and a list of abbreviations (at the beginning of the work).

In general, the work is devoted to different methods, systems and algorithms for coding geospatial data – coordinates, spaces and subspaces with different peculiarities, advantages and disadvantages in terms of different tasks, requirements and performance.

The thesis of the monograph is "the need to change and improve existing geocoding systems in order to support their use in different situations and to contribute to the faster processing of geospatial data in new ways in the



conditions of constant increase in data volumes and the need for timely processing."

The aim of the work is "in the conditions of extremely rapid growth of the volumes of geospatial data from different devices to propose new algorithmic approaches to the widely used geocoding system Geohash, which will allow acceleration of computational operations and application of new approaches to the use of geospatial data." 5 tasks are defined.

The object of study is "certain geocoding systems that are of fundamental importance in the processing of geospatial data" and the subject is "the possibilities for applying new algorithmic approaches in geocoding".

The first chapter is entitled "Geospatial Data and Geocoding" and is in a volume of 20 pages. The essence of geocode and geocoding, some systems and applications in practice are discussed.

The second chapter is entitled "Basic characteristics of established in practice geocoding systems" and has a volume of 24 pages. The author explores several basic similar systems used of different types – with one level, with equiangular and equi-area tessellation. The chapter concludes that one of the commonly used systems – Geohash – can and should be improved, which is mainly what the following chapters are dealing with.

The third chapter is entitled "Rasterizing algorithm for finding an arbitrary piece of geohash code" and is in volume of 19 pages. The chapter presents some existing algorithms and proposes authoritative in order to improve efficiency in certain situations.

The fourth chapter is entitled "Equiarea tessellation in geohash coding" and is in volume of 19 pages. The author discusses the problems of disparity in equiangular tessellation and proposes changing the geohash system so that all cells of one level of accuracy have the same area.



The fifth chapter is entitled "Application of the algorithmic approach to rasterization" and is in a volume of 34 pages. The chapter is devoted to some peculiarities in the potential application of the algorithm proposed by the author in the third chapter.

The conclusion of the work summarizes it and indicates 5 contributing moments.

*Main positive moments of the work:*

In view of the ubiquitous use of geographical localization and coding, the theme of the monograph is interesting and topical.

The author has studied and analyzed many systems, approaches and algorithms in the subject area.

The proposed material is correct, appropriate, written in its majority with good style, in some places a little more colloquial, but interestingly presented.

A variety of sources are studied and aptly cited, many examples are given.

The author has proposed an algorithmic approach to finding certain symbols of the geohash code.

An approach for equi-area tessellation at geohash is also proposed.

Program modules for coding and decoding geohash codes have been developed.

*Critical notes to the monograph:*

Two notes/recommendations can also be made to the monograph:

1. Probably a very small part of readers will pay attention to the appendices, and they occupy almost 50 pages, which is too much (given that the main text is about 120 pages).



2. The author can work more in the direction of exploring the peculiarities and opportunities for application of one of his main proposals in the monograph (from the fourth chapter).

*The other scientific publications* of the author concern a variety of topics, which can still be summarized on the following main topics:

1. geocoding (as in the main monograph);
2. digitalization of the banking sector;
3. digitalization in other business sectors;
4. characteristics of social media;
5. technological issues concerning web applications;
6. problems of the security of information systems;
7. databases;
8. problems of education, etc.

The wide range of topics also shows the erudition of the author in the professional sphere.

25 of the publications are in publications indexed in Scopus and/or Web of Science. Almost all other scientific publications are indexed in other databases.

At the time of submission, publications have been cited a total of 155 times, of which a large share in Scopus and/or Web of Science, which is an excellent achievement.

Assoc. Prof. Petrov has supervised a total of 5 PhD students, incl. one successfully defended. He is a member of several editorial boards of specialized editions, as well as program and organizing committees of scientific events.

*The following major contributions* in the publications of Assoc. Prof. Pavel Petrov, D.Sc. can be pointed out (according to the reference presented by him; summarized by me, and some of them already referred to the main monograph):



1. Study of geocoding systems with justification of the need for new algorithmic approaches. Development of new similar approaches and program modules.
2. The possibilities for the application of new protocols and approaches in the creation of web applications are explored and analyzed
3. Research and proposals are made regarding the application of information technologies in various areas of the economy – banking, construction, maritime transport, start-up companies.
4. Research and analyses have been made on the processes of digitalization of educational services.
5. Analyses and suggestions regarding application of different databases.

### **III. Teaching and other activities of the applicant**

Assoc. Prof. Pavel Petrov, D.Sc. has 23 years of experience as a full-time lecturer, incl. 13 years as an associate professor. For each of the academic years he has over 400 hours of classroom activity equated in exercises.

Over the years he has taught classes in many disciplines such as "Informatics", "Object-oriented Programming" (incl. in English), "Visual Programming with Java" (incl. in English), "Computer Graphics", "Server Programming" (incl. in English), "E-Business", "Server MVC Programming", "Web Applications with Node.js", "Real-Time Web Technologies", "Foundations of Object Oriented Programming" (in English).

He has participated in 6 textbooks and aids, as well as in many electronic learning materials, he has participated in the development of about 30 curricula in different disciplines, incl. in PhD programs.



Assoc. Prof. Pavel Petrov has participated in 15 scientific projects and managed 7 of them.

#### **IV. Critical notes and recommendations**

I have already expressed some notes on the main monographic work of the candidate. I will recommend to Assoc. Prof. Petrov, as a future professor of the University of Economics - Varna, the Faculty of Informatics and the Department of Informatics, to work actively for the development of the institution and the units.

#### **V. Assessment of compliance and conclusion**

In conclusion, I can summarize the compliance of the achievements of the applicant with the mandatory requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria, the Regulations for the application of the Law on The Development of the Academic Staff in the Republic of Bulgaria, including the minimum national requirements, and the Regulations for the Development of the Academic Staff at the University of Economics – Varna.

With regard to the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria and its Implementing Regulations:

The applicant holds the educational and scientific degree "Doctor" and "Doctor of Science".

The candidate has held the academic position associate professor for more than 2 academic years.

The candidate has presented a monographic work, as well as other publications in specialized scientific publications.





The applicant meets and exceeds the minimum national requirements for the academic position "Professor" in the professional field 4.6 in respect of all categories and in total.

No plagiarism has been established.

With regard to the additional requirements in the Regulations for the Development of the Academic Staff at the University of Economics – Varna:

The main monographic work was published in a specialized scientific publishing house and was discussed in advance in a specialized primary unit (department) and was reviewed by two habilitated individuals.

The applicant also fulfils the other minimum quantitative requirements for publications and citations.

The candidate participated in at least one research project and supervised a successful PhD student.

In view of the above, I believe that the applicant meets the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria, the Regulations for the Application of the Law on The Development of the Academic Staff in the Republic of Bulgaria and the Regulations at the University of Economics – Varna . On the basis of this, and also on the basis of all the actual achievements of the candidate, I recommend to the esteemed jury to award the academic position "Professor" in the professional field 4.6 Informatics and Computer Science to Assoc. Prof. Pavel Stoyanov Petrov, D.Sc.

18.04.2024

Varna

Reviewer:

(Prof. Dr. Vladimir Sulov)

Заличена информация съгласно  
ЗЗЛД и регламент (ЕС) 2016/ 679



## REVIEW

By prof. Dr. Julian Andreev Vasilev, University of Economics – Varna,  
Professor at PN 4.6 "Informatics and Computer Science", validated in the register of academic  
staff of NACID "Habilitation persons with scientific indicators";  
Member of the Scientific Jury for **academic position "Professor"** in a competition  
announced by the University of Economics - Varna (UE-Varna)

### I. Reason for writing the review

Order of the Rector of UE-Varna RD 06-33/27.02.2024 for determining the composition  
of the scientific jury; First meeting of the scientific jury on 13.03.2024.

### II. Competition data

The competition was announced in the field of higher education 4 "Natural Sciences,  
Mathematics and Informatics", professional field 4.6 "Informatics and Computer Sciences",  
scientific specialty "Informatics"; for the needs of the Faculty of Informatics and the  
Department of Informatics at UE-Varna. An ad was published in the State Gazette No.  
2/05.01.2024

### III. Candidate in the competition

The only candidate in the competition is **Assoc. Prof. Pavel Petrov**, DSc. He holds a  
diploma for NSA "Doctor" (diploma 28474/19.05.2003) from the Higher Attestation  
Commission. He has held academic positions "Assistant" (2001-2004) "Chief Assistant" (2004-  
2011) and "Associate Professor" (2011 until now). In addition to the University of Economics  
- Varna he has worked at the UNWE (as a researcher; 2018-2023), Center for Vocational  
Training "Knowledge and Business", Varna Free University. He has participated in scientific  
juries, editorial boards of journals, program and organizing committees of conferences. She  
has a Diploma for "Doctor of Science" from ULSIT (diploma 0529/22.03.2022).

The candidate Assoc. Pavel Petrov, D.Sc. covers the minimum national requirements  
(EOM) described in the Regional Educational Institute, and the minimum university  
requirements (MUI) for "professor" in PN 4.6. According to certain criteria, the candidate's  
points exceed the minimum points.

Table 1.

Meeting minimum national requirements (MNR)

Indicator	MNR according to ZRASRB	Points of Assoc. prof. Pavel Petrov
A	50	50
B	-	-
V	100	100
G	200	840
D	100	440
E	100	460



**Table 2.**

### Meeting Minimum University Requirements (MUR)

№	Indicators	MUR for "professor"	Points of Assoc. Pavel Petrov
1.	Scientific reports	60	155
2.	Scientific articles and studies	115	128
3.	Papers in Scopus and/or WoS	30	180
4.	Citations in Scopus and/or WoS	15	840
5.	Defended PhD students	40	40
6.	Research projects (participation and/or management)	15	330

#### IV. Content characteristics of the submitted works

Prof. Pavel Petrov, D.Sc. participated in the competition for "professor" with **81 publications**, including 5 monographs, 6 studies, 27 articles, 37 conference papers, 6 textbooks and textbooks.

**Table 3.**

### SUMMARY TABLE OF SUBMITTED PUBLICATIONS

№	Type of publications	Private		Co-authored		Total	
		Count	P..	Count	P..	Count	P..
1.	Monographs	2	303	3	214	5	517
2.	Studies	2	73	4	26	6	99
3.	Scientific articles	4	45	23	100	27	145
4.	Conference papers	13	88	24	51	37	139
5.	Textbooks and teaching aids	3	414	3	239	6	653
6.	Other publications	-	-	-	-	-	-
<b>Total:</b>		<b>24</b>	<b>923</b>	<b>57</b>	<b>630</b>	<b>81</b>	<b>1553</b>



Table 4.

## SUMMARY TABLE OF VOLUME AND TYPE OF OUTPUT

№	Type of publications	To participate in the competition for professor		Total <sup>1</sup>	
		Count	P..	Count	P..
1.	Monographs	5	517	7	596
2.	Studies	6	99	7	138
3.	Scientific articles	27	145	37	224
4.	Conference papers	37	139	62	226
5.	Textbooks and teaching aids	6	653	9	928
6.	Other publications	-	-	-	-
	<b>Total:</b>	<b>81</b>	<b>1553</b>	<b>122</b>	<b>2112</b>

According to the requirements of the ZRASRB, the Regional Development Act and the Rules for the Development of the Academic Staff at UE-Varna, the candidate for the academic position of "**professor**" must meet the following conditions.

- To have acquired the PhD. *Prof. Pavel Petrov, DSc meets this condition. He defended his dissertation at the Higher Attestation Commission in 2003. The topic of his dissertation is "Complex Information Systems for Management of Production Enterprises".*
- To have held an Acad. position "Associate Professor" for at least 2 years. *Prof. Pavel Petrov has held the academic position of Associate Professor since 2011 (number and date of appointment: RD 17 1641 / 17.06.2011).*
- A published monographic work is presented. *The candidate has a published independent monograph "Petrov, P. (2023) Algorithmic Approaches in Coding Geospatial Data. Monographic Library "Prof. Tsani Kalyandzhiev", vol. 92. Varna: Science and Economics, ISSN 978-954-21-1162-7".*
- To answer the EOM for the academic position "professor". *The candidate covers the EOMs.*
- Meet the minimum university requirements. *The candidate covers the MUI.*
- No plagiarism has been identified. *There is no established plagiarism. The works used to participate in the competition have passed a plagiarism test and a review process before being published.*

<sup>1</sup> In the column Total are included all publications of the candidate – on the topic of the dissertation, in the competition for "associate professor" and in the competition for "professor".



- Have at least one PhD student. *Prof. Pavel Petrov has a PhD student (Dr. Svetoslav Ivanov).*

The monographic (habilitation) work used to participate in the competition (*Algorithmic Approaches to Geospatial Data Coding*) is an independent monographic work; it has been discussed in the primary unit (Department of Informatics), it has been peer-reviewed by two habilitated persons, it has been published in a specialized scientific publishing house, it has ISBN, it has a developed content; it has a comprehensive bibliography, it does not repeat already known knowledge; it brings out a significant scientific problem at a high scientific level; as a volume it is **198 pages**.

Prof. Petrov has a profile in Scopus (<https://www.scopus.com/authid/detail.uri?authorId=57191977873>). **In Scopus there are 41 publications, 91 citations, h-index: 5.**

He has a WoS (<https://www.webofscience.com/wos/author/record/L-8152-2017>) profile. **In WoS there are 16 publications, 22 citations, h-index: 3**

Prof. Petrov has profiles and Scholar Google, ORCID (<https://orcid.org/0000-0002-1284-2606>), RePEc, CEEOL and Research Gate. Most of the publications are visible in full-text version.

All publications of Assoc. Prof. Petrov (total: 134) have been entered in the Register of Publications of UE-Varna (<https://publications.ue-varna.bg/list-author/2R1R>).

The publications with which the competition is participated have not been used to occupy a previous academic position or academic degree.

## V. Study work. Project work. Mobilities

In the Bachelor's degree Assoc. prof. Petrov has conducted classes in the following disciplines: Object-oriented programming, Visual programming with JAVA, Server programming, Server MVC programming, Computer graphics, Informatics.

In the Master's degree Assoc. prof. Petrov has conducted classes in the following disciplines: Server programming, E-business, Object-oriented programming, Server MVC programming.

In recent school years, there has been a full audience workload.

P. Petrov participates in the preparation of a number of curricula.

In the period 2011-2024 Assoc. Prof. Petrov participated in **15 projects**. Of 7 of them he was the leader.

Assoc. Prof. Petrov has participated in outgoing mobilities under the **Erasmus** program and projects: Limerick (2017), Istanbul (2019), Bucharest (2023). He has participated in welcoming fellow lecturers in incoming mobilities.



## VI. Contributions, citations

The following contributions stand out in the habilitation work on the competition:

1. A new approach has been developed to compile short geohash codes. The approach has been tested and validated.
2. A new approach has been developed to apply equi-area tessellation in geohash. The approach has been tested and validated.
3. Algorithms for geohash encoding and decoding have been developed.

In the other publications can be highlighted additional contributing points related to:

1. Approaches to creating server web applications have been developed.
2. Approaches in GIS have been developed.
3. Approaches to the digitalization of business processes have been developed.
4. Suggestions are made for the use of big data processing technologies.

Assoc. Prof. Petrov has a total of **155 citations**. The reference to the citations is made correctly – autocitations are not included.

## VII. Critical remarks, questions and recommendations

P. Petrov has one successfully defended PhD student – Dr. Svetoslav Ivanov. He was the supervisor of two more PhD students (Valentin Atanasov and Petar Dimitrov). Currently, he is the supervisor of two PhD students (Dimitrios Simeonidis and Yordan Yordanov). I recommend to Assoc. prof. Petrov to continue working with PhD students. To involve PhD students and students in their work on scientific projects.

I recommend that she continue to participate in Erasmus mobilities; continue to participate in projects and lead projects.

I recommend participation in the courses for incoming Erasmus students.

## VIII. Conclusion

The careful review of all documents and publications of the candidate **Assoc. Prof. Pavel Petrov, D.Sc.**, submitted for participation in the competition for the academic position of "**professor**" in PN 4.6, shows that all the requirements of the ZRASRB, RIRZRB and the Rules for the Development of Academic Staff at UE-Varna have been met. The applicant meets the minimum national and university requirements for holding the academic position of "**professor**" in PN 4.6 at the time of announcing the competition.

I give my positive opinion on the readiness of the candidate **Pavel Petrov** to take the academic position of "**Professor**" of the University of Economics - Varna in professional field 4.6 "Informatics and Computer Science", scientific specialty "Informatics".

Apr 11, 2024  
Varna

Sincerely:

/Julian Vassilev/

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