

REVIEW

by Prof. Dr. Boyan Paskalev Bontchev,
Faculty of Mathematics and Informatics, Sofia University "St. Kliment Ohridski ”
in a competition for the academic position of "Associate Professor"
at the Plovdiv University "Paisii Hilendarski",
Faculty of Mathematics and Informatics,
in the field of higher education: 4. Natural sciences, mathematics and informatics,
professional field: 4.6 Informatics and computer sciences
(Informatics – Software technologies),
announced in State Gazette no. 57 / 26.06.2020

By order of the Rector of Plovdiv University "Paisii Hilendarski" No.R33-4129 from date 25.08.2020 I have been appointed a member of the Scientific Jury for conducting a competition for "Associate Professor" *in the field of higher education 4. Natural Sciences, Mathematics and Informatics; professional field 4.6. Informatics and Computer Science (Informatics - Software Technologies)*, announced in State Gazette, issue 57 from 26.06.2020 Documents for participation in the competition were submitted by one candidate - Chief Assistant Professor Dr. Emil Hristov Doychev, from department "Computer systems" at the Faculty of Mathematics and Informatics (FMI). With Protocol No.1 from 08.09.2020 at a meeting of the scientific jury of the competition I was chosen as a reviewer of this application. This document presents my review of this competition.

1. General description of the submitted materials

As a member of the jury I received the following documents:

1. CV in European format;
2. diploma for higher education at the educational-qualification degree “master” - Series PU-99, № 075857, reg. № 2417-M from 02.11.1999 and appendix;
3. diploma № 1000075 from 16.09. 2013 for educational and scientific degree "Doctor";
4. list of all scientific papers and copies of those for participation in the competition, incl. And a list of noticed quotes for participation in the competition;

5. references for observance of the minimum national requirements and of the additional requirements of FMI at PU, according to art. 65. (3) of PRASPU:

6. annotations of the materials under art. 65. of PRASPU, including self-assessment of contributions (in Bulgarian and English);

7. declaration for originality and authenticity of the attached documents;

8. certificate for work experience - U-226 / 22.07.2020;

9. documents for educational work - inquiries for classroom and extracurricular employment, for work with students and graduates, and a list of published educational materials;

10. documents for research work:

11. set of documents on paper from item 1 to item 10;

12. set of documents from item 1 to item 10 on electronic carrier.

All submitted documents are designed and described thoroughly, in detail and very carefully.

2. General characteristics of the research and teaching activity of the candidate

Chief Assistant Professor Dr. Emil Doychev is author or co-author of 46 scientific publications. The papers with which the candidate participates in the competition for Associate Professor are 28 in total and include 25 scientific papers - including 7 articles in scientific scholar journals (two of which are published as book chapters), two books, one separate chapter of a book, and 15 are in conference proceedings. 12 of them are referred to in SCOPUS, and three - in Web of Science (WoS) database. Six of the journal publications are in SJR index publications, with a total SJR index (including that printed in Lecture Notes in Computer Sciences) of **1.434**. One publication is in an IF edition of **0.284**. In addition to these 25 scientific papers, the candidate presents a textbook on software technology and a learnbook - "Guide to Software Technology", and a PhD thesis abstract. The presented abstract is of his dissertation for awarding the educational and scientific degree "Doctor" (defended at the Plovdiv University "Paisii Hilendarski" in 2013) on "Environment for digital educational services." In addition, the candidate presented 10 papers at one national and nine international conferences. All 28 works for participation in the competition were not included in other competitions. In addition, the results and contributions in the scientific production presented at the competition are original and are not borrowed from research and publications in which the candidate does not participate.

Emil Doychev has gained serious research experience from participation in 9 research projects, whereupon 8 of which are regional (5 funded by the Ministry of Education and Science and 3 by the "Research and Project Activities" division at the University of Plovdiv since 2013), and one is funded by the German Academic Exchange Service (so called DAAD). All nine projects are in the field of using ICT for research and e-learning applications.

The candidate has a rich teaching activity. He has almost 9 years of teaching experience, of which over 6 years are experience as a Senior Assistant Professor. He has taught at FMI-PU as an Assistant Professor (for the period 2011-2014) and as Chief Assistant Professor (for the period from 2014 to the present). His annual

classroom employment has always been above the norm. Compulsory courses for bachelor students presented by Chief Assistant Professor Dr. Emil Hristov Doychev, include "Software and Architecture Design", "Software Processes", and "Design Templates". For undergraduate students, he also has taught the elective courses in Java Programming and in Portal Application Development. His disciplines in master's programs include "Languages and environments for programming on the Internet", "Integration of databases in a web environment", "Programming with standards and frameworks", "Current problems of software technologies", "Architectures and systems oriented to services" (optional), Practical projects 1 and 2, and Service-Oriented Architectures. In addition, the candidate has developed 9 lecture courses, which is evident from the presented report on academic employment.

In addition to the classroom workload, the candidate has an active extracurricular activity as a research supervisor of over twenty graduates in the field of software technology, and with some of them he has written joint scientific articles. Additionally, the candidate has been a reviewer of over 20 master's theses and a member of commissions for conducting state exams and defending MSc theses. He has published a learnbook and a manual for laboratory exercises in software technology.

3. Analysis of the scientific and scientific-applied achievements of the candidate

The scientific and scientific-applied activity of the candidate is concentrated mainly in the development of architecture, design and use of virtual educational and physical spaces - an area that in the last two decades has become increasingly relevant for effective electronic and distance learning, especially in the crisis situation in viral pandemics. In this sense, the achievements of the candidate can be divided into three thematic areas:

- Design and construction of virtual educational spaces (VES) - this area further develops and builds on the previous developments of the candidate (including his dissertation) on the creation of architecture and implementation of the Distributed e-Learning Center (DeLC). Thirteen of the publications presented in the competition describe the development of an IOP architecture and its use to create software (such as the AjTempura agent-oriented application, the ReLE Refactoring eLearning Environment, digital libraries and the Focus authorization system) to access e-learning services and educational scenarios using smart agent-based approaches, personalization, and adaptability;
- Upgrading VES by creating a reference architecture for Internet of Things (IoT) ecosystems, presented as Virtual Physical Space (ViPS) and its application in e-learning. For this purpose, the candidate offers formalisms for presenting and working with the temporal, spatial and event aspects of things, together with active operational assistants and the so-called. guards realized as rational BDI agents. These results are presented in 6 of the proposed publications;
- Application of ViPS reference architecture in the fields of e-learning (in the eTesting and BLISS systems), intelligent agriculture (GenBankSystem system for maintenance and processing of plant gene pool information, together with GenBankOntology ontology) and tourism (intelligent multi-agent tourism) – the results are presented in 8 of the proposed publications.

Candidate's contribution to collective publications

All 25 scientific publications have been developed in co-authorship with Bulgarian and foreign scientists, whereupon the candidate is the first author in 3 of them, the second author in 6, the third author in 8, the fourth in 7 and the fifth in one of them. Although no single-author publications have been submitted, I have no doubt in the applicant's significant personal contribution to the above results.

Reflection of the candidate's results in the works of other authors

The candidate has submitted a report on observed citations of his papers, which includes data on 86 citations of a total of 19 scientific papers. Nine of these citations are in publications in SCOPUS and WoS. It is important to note that 19 of the citations are by authors who do not belong to the research teams of FMI at PU, and 10 of them are by foreign researchers. The list does not contain self-citations and citations of co-authors.

4. Fulfillment of the national and additional requirements for FMI-PU for holding the academic position "Associate Professor"

The reviewer accepts the report submitted by the candidate for compliance with the national minimum requirements for holding the academic position of "Associate Professor" in direction 4.6, where the indicators of groups A and B are met, and the points for indicators of groups D and E exceed by **51.5%** and **60%** the national minimum requirements. At the same time, the accumulated points for indicators of group E are **85**.

On the other hand, the additional requirements of the Faculty of Mathematics and Informatics at Plovdiv University "Paisii Hilendarski" of have been exceeded - 25 publications instead of the required at least 10, 7 publications in journals (including 3 publications in journals with impact factor or equivalent) at minimum requirement for at least 5, 1 learnbook and 1 manual (instead of a learnbook or manual), and last but not least - 86 citations with a minimum requirement of at least 5. It is noteworthy that the number of citations exceeds **17 times** the minimum requirement of FMI at PU.

5. Critical remarks and recommendations to the candidate

The learnbook and manual on software technologies submitted to the competition do not constitute essentially scientific papers and should therefore be excluded from this list and presented separately, which would not diminish their relevance.

The reference for the academic employment of the candidate does not contain a list of the successfully defended over 20 graduates, of which the candidate was a scientific supervisor. However, from conversations with colleagues from the FMI of the University of Plovdiv, I know that they have defended their master's theses with very high marks. That is why I have no doubts about the quality of Emil Doychev's extracurricular activities.

I would recommend the candidate to emphasize the creation of independent, single-author scientific publications.

6. Personal impressions of the candidate

I have excellent impressions of the candidate - both personal from the defense of his dissertation in 2013 and from later discussions in the field of virtual educational spaces and intelligent agents, and indirect ones from conversations with his colleagues and students. I highly appreciate his scientific and practical professionalism, as well as the demonstrated consistency and perseverance in his pursuit of high academic results. Apart from them, his professional qualities as a software specialist and manager of industrial IT projects should also be noted here. Such a combination of research, teaching and practical skills in the field of software technology is particularly suitable for the professional field of the academic position for which he is applying.

7. Conclusions

The documents on the competition for Associate Professor, presented by Chief Assistant Professor Dr. Emil Doychev, meet the requirements of the Law for the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB), the Regulations for implementation of ZRASRB and the relevant Regulations of PU "P. Hilendarski" and the FMI of PU. The scientific papers presented at the competition are on the topic of the competition and make an excellent impression with the level of scientific content. The teaching work of the candidate is on the topic of the competition, significant in volume and at the required high professional level.

According to the above, I give **a positive opinion on the choice of Chief Assistant Professor Dr. Emil Hristov Doychev in a competition for Associate Professor** at the FMI of Plovdiv University "P. Hilendarski" *in the field of higher education 4. Natural sciences, mathematics and informatics; professional field 4.6. Informatics and Computer Science (Informatics - Software Technologies)* and I advise the esteemed jury to propose to the Faculty Council of FMI at the University of Plovdiv to elect him to the academic position of "Associate Professor".

16.10.2020

Sofia, Bulgaria

Prepared the review:

(Prof. Dr. Boyan Bontchev)