

# OPINION

by Assoc. prof. Detelin Mihaylov Luchev, PhD

**Institute of Mathematics and Informatics, Bulgarian Academy of Sciences**

on the Dissertation for awarding educational and scientific degree “**doctor**” (PhD),

in the Area of Higher Education 4. Natural Sciences, Mathematics and Informatics,

Professional Field 4.6. Informatics and Computer Sciences

PhD Program „Informatics“

**Author:** Nektarios Moumoutzis

**Topic:** Operational Conceptual Modeling in Building and Sustaining Virtual Communities

**Scientific supervisor:** Prof. Radoslav Dimov Pavlov, PhD, Institute of Mathematics and Informatics, Bulgarian Academy of Sciences.

## 1. General presentation of the procedure and the PhD student

In accordance with Order № 208/20.07.2022 of the Director of the Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences (IMI-BAS) I have been appointed as a member of the Scientific Jury to provide the procedure for the defense of a dissertation titled “Operational Conceptual Modeling in Building and Sustaining Virtual Communities” of Nektarios Moumoutzis for awarding the educational and scientific degree “doctor” in the Area of Higher Education 4. Natural Sciences, Mathematics and Informatics, the Professional Field 4.6. Informatics and Computer Sciences of the PhD Program “Informatics”. The author is a PhD student at the Department “Mathematical Linguistics”, IMI-BAS, with scientific supervisor Prof. Radoslav Dimov Pavlov, PhD, IMI-BAS.

The presented Opinion is made in accordance with the Act for the Development of the Academic Staff in the Republic of Bulgaria, the Rules for its implementation, Rules on the Terms and Conditions for Acquisition of Academic Degrees and Occupation of Academic Positions at the Bulgarian Academy of Sciences (BAS) and Rules on the Terms and Conditions for Acquisition of Academic Degrees and Occupation of Academic Positions at IMI-BAS.

As a member of the scientific jury, I have been presented with all the required documents including: an application to the president of IMI-BAS for admission to a defense of the dissertation; a curriculum vitae; an order for enrollment in a doctor’s degree programme; protocols for the completed exams, according to the programme plan; an order for disenrollment from a doctor’s degree programme; an order of the Director of IMI-BAS for discussion of the dissertation by a primary section; a list of scientific publications on the dissertation; a list of quotations of the scientific publications on the dissertation; copies of the scientific publications on the dissertation; the dissertation;

the author's summary of the dissertation (on Bulgarian and English); a reference to the scientific contributions of the dissertation and the scientific publications on the dissertation.

Nektarios Moumoutzis was born on 18.07.1970. In 1992 he obtained a Bachelor's degree in Computer Science from the University of Crete, Greece, and in 1998 a Master's degree (MEng) in Electronic and Computer Engineering from the Technical University of Crete, Greece. Since 2001, Nektarios Moumoutzis has been working at the Laboratory for Distributed Multimedia Information Systems and Applications at the Department of Electronic and Computer Engineering of the Technical University of Crete, Greece, as a researcher and international project leader and teaches in disciplines such as Introduction in Computer Science, Databases, Software Development Tools, Theory of Computation.

## **2. Relevance of the topic**

The dissertation presents results of research aimed at the use of modern digital technologies to promote creativity and learning within rich social contexts for set up the ground for a systematic analysis and subsequent enhancement of digital systems in close connection to the communities that use these systems to achieve certain objectives and carry out certain tasks. The topic is current and of great scientific and practical interest.

## **3. Knowledge of the problem**

It is evident from the presented dissertation and materials that the PhD student has solid theoretical training, practical skills and in-depth knowledge of modern technologies necessary to achieve the research objectives. He demonstrates good knowledge of the research object. He formulates clearly and performs the tasks leading to specific results. The research is presented competently and with well-founded analyses and inferences.

## **4. Research methodology**

I consider the methodology used by the PhD student to achieve the formulated objectives and corresponding tasks to be appropriate, well-motivated and suitable for the successful implementation of the research, which is evident from the results obtained.

## **5. Characteristics and evaluation of the dissertation and contributions**

The dissertation of Nektarios Moumoutzis contains 164 pages, presented by an introduction, five chapters, a conclusion, list of scientific and scientific-applied contributions, a list of tables, a list of figures, a list of abbreviations used, a declaration of originality of the results and contributions, a bibliography of 108 literature sources and a list of 16 author's publications on the topic of the dis-

sertation. It also has two appendices presenting a theater game "Human calculator" and the binary board game "Abacus". A list of 10 international and national projects in which the software developments of the presented in the dissertation Coursevo, ViSTPro и eShadow applications have been used, is given in the Dissemination of Results and Future Work section.

The development offers techniques, tools and methods that enable the analysis on how such technologies are actually used by their users and how they can be enhanced and even repurposed to increase their effectiveness. The aim is the creation of an inclusive design and implementation framework that can help designers and developers deliver highly usable and effective environments that establish and sustain onlife communities. This framework is titled PerFECT: a Performative Framework to Establish and Sustain Onlife Communities. The cases studies presented shed light on how the framework can be used and what kind of enhancements are possible including situations when digital technologies are combined with more traditional approaches.

The dissertation is thoroughly developed. The problem area is competently and critically analyzed. The presentation of the development and implementation of the developed applications is comprehensive, well argued and appropriately illustrated.

I accept all contributions of the PhD student achieved as a result of the research and development carried out, namely:

- Studies and practically oriented analyses of key concepts and actual principles of the modern digital technologies promoting creativity and learning within rich social contexts and focusing on current developments in computer supported collaborative work and participatory design:
  - Development of PerFECT, a Performative Framework to Establish and Sustain Onlife Communities based on a conceptual framework, incorporating models and specific guidelines for using digital systems to empower communities, enhanced as a result of the performed analyses. Organizing a number of communities building initiatives that employ the PerFECT framework related to specific digital tools and addressing specific learning and creativity domains;
  - Development and enhancement of the eShadow tools inspired by Greek traditional shadow theatre and usage in order to establish and sustain communities in digital cultural heritage;
  - Development and enhancement of ViSTPro, a spatio-temporal process visualization platform that enables rich learning experiences in diverse domains including cultural heritage in general and history learning in particular;
  - Development and enhancement of Coursevo, a community building, distant training and learning platform that facilitates the building and support of communities of practice and communities of learning;
  - Applied practical directions for the implementation and experimentation with the proposed community building structures and services within the context of specific experimentation settings

that employ standard tools such as SUS and UEQ in combination with specialized questionnaires to assess the view and evaluate experiences of members of the studied communities.

I consider that the contributions achieved have sufficient significance in a scientific and scientific-applied aspect.

## **6. Assessment of publications and personal contribution of the PhD student**

The author's list of publications on the subject of the dissertation includes 16 titles, 14 of which are indexed in Scopus or Web of Science. Five publications are in editions with SJR, with 4 of them in the Q4 group of Scopus, including an international journal publication in Scopus Q4. All publications are in English and are from the period 2018 – 2022. All publications are co-authored, but Nektarios Mamoutsis is the first author in all publications, therefore the authorship of the PhD student and his main contribution to the submitted publications are beyond doubt. No list of citations is presented, although, regardless of the short period since the publications, some can be found, but according to the attached list, the doctoral student reported the results of the dissertation work at 11 international scientific conferences, which provided an opportunity to present and evaluate these results.

There are no cases of plagiarism found.

The presented publications on the dissertation of Nektarios Mamoutsis, by their characteristics and number, meet and significantly exceed the normative requirements for obtaining the educational and scientific degree "doctor".

Having read the dissertation and the submitted materials, I believe that the formulated contributions and the obtained results are the personal work of the PhD student.

I have no critical remarks.

## **7. Abstract**

The abstract, presented in Bulgarian and English version, has been prepared according to the requirements and correctly reflects the structure of the dissertation, the results obtained and the conclusions drawn from the study.

## **8. Recommendations for future use of the dissertation contributions and results**

The topic and results provide opportunities for development and new applications. I would recommend Nektarios Mamoutsis to continue his research and expand its popularization by publishing in high impact factor and impact rank journals and by presenting it more comprehensively in a monograph based on the dissertation.

## CONCLUSIONS

The dissertation *contains scientific, and applied results, which represent an original contribution to science* and *meet all the requirements* of the Law for the Development of Academic Staff in the Republic of Bulgaria, the Rules on the Terms and Conditions for Acquisition of Academic Degrees and Occupation of Academic Positions at BAS and the Rules on the Terms and Conditions for Acquisition of Academic Degrees and Occupation of Academic Positions at IMI-BAS.

The dissertation shows that the PhD student Nektarios Mamoutsis **possesses** in-depth theoretical knowledge and professional skills in the scientific specialty “Informatics”, **demonstrating** qualities and skills for independent scientific research.

Due to the above, I confidently give my *positive evaluation* for the conducted research, presented in the dissertation, abstract, achieved results and contributions, and *I propose the honorable scientific jury to award educational and scientific degree “doctor”* to Nektarios Mamoutsis in the Area of Higher Education 4. Natural Sciences, Mathematics and Informatics, Professional Field 4.6. Informatics and Computer Sciences, PhD Program “Informatics”.

10.10.2022

Scientific jury member: .....

/Assoc. prof. Detelin Luchev, PhD/