

# REVIEW

by **Corresponding Member Lyubka Doukovska, DSc**  
from the Institute of Information and Communication Technologies,  
at the Bulgarian Academy of Sciences,  
on the Thesis for awarding educational and scientific degree **PhD**,  
under the Scientific Field: **4. Natural Sciences, Mathematics and Informatics**,  
the Professional Area: **4.6. Informatics and Computer Sciences**,  
the Scientific Specialty: **Informatics**

Author of the PhD Thesis: **Tsvetomira Ivanova Kazashka**

Thesis Title: **Creating an Ontology of Bulgarian Dance Folklore**

In accordance with Order No. RD-22-487 from 21.02.2025 of the Rector of the Plovdiv University “Paisii Hilendarski”, I have been appointed as a member of the Scientific Jury regarding the PhD thesis of **Tsvetomira Ivanova Kazashka** for awarding the educational and scientific degree “Doctor of Philosophy” (PhD) in the Scientific Field **4. Natural Sciences, Mathematics and Informatics**, the Professional Area **4.6. Informatics and Computer Sciences**, the Scientific Specialty **Informatics**. The scientific advisors are Prof. Daniela Kirilova Djeneva and Prof. Stanimir Nedyalkov Stoyanov.

As a member of the Scientific Jury I have received:

1. Order No. RD-22-487 from 21.02.2025 of the Rector of the Plovdiv University “Paisii Hilendarski”;
2. Application for opening a procedure for acquiring the educational and scientific degree PhD;
3. European Curriculum Vitae;

4. Protocol No. 5-24/25 from 17.01.2025 of the preliminary discussion of the PhD Thesis in the Computer Systems department;
5. Abstract of the PhD Thesis;
6. Declaration for the original scientific and applied scientific contributions;
7. Reference to the implementation of the minimum requirements of the of the Faculty of Mathematics and Informatics at the Plovdiv University “Paisii Hilendarski” for obtaining the educational and scientific degree PhD;
8. List of the publications included in the PhD thesis;
9. Dissertation for the educational and scientific degree PhD;
10. Official notes No. 40/11.02.2025 and No. 10/04.02.2025 for participation in projects;
11. Copies of the publications included in the PhD thesis.

In order to form the final evaluation of the dissertation, the requirements of the *Development of Academic Staff Act in the Republic of Bulgaria* are implemented the specific requirements in the Act’s Institutional Regulation shall be taken into consideration, where the respective norms are:

1. Pursuant to Art. 6 (3) of the *Development of Academic Staff Act in the Republic of Bulgaria*, PhD thesis should contain scientific or scientific-applied results, which represent an original contribution in science. The PhD thesis must indicate that the candidate has in-depth theoretical knowledge of the relevant specialty and ability for independent research.

2. According to Art. 27 (2) of the specific requirements in the Act’s Institutional Regulation, PhD thesis should be presented in a form and volume corresponding to the specific requirements of the primary unit. The PhD thesis should contain: a cover page; content; introduction; exhibition; conclusion - a summary of the results obtained with a declaration of originality; bibliography.

### **I. Actuality and significance of the PhD thesis.**

The relevance of the PhD thesis is determined by the field of research presented, namely Artificial Intelligence. Artificial Intelligence is the science of the concepts, methods and means of creating intelligent models for the study of natural

intelligence, part of this study is also carried out through the means of semantic modeling.

The PhD thesis submitted to me for review is dedicated to the semantic modeling of the Bulgarian cultural and historical heritage, focusing on the Bulgarian dance folklore.

The aim of the PhD thesis is „to expand the platform, based on the ViPS concept, for the digitization of the cultural and historical heritage of Bulgaria, by developing an ontology of folk dances, which allows for scientifically based structuring and classification of the Bulgarian dance heritage in digital format.”

To achieve the goal, the following tasks are defined:

1. Current state analysis and concept creation. To present a conceptual framework, analyzing the current state and emphasizing existing experience related to virtual physical space (ViPS).

2. To select and analyze samples of Bulgarian folk dance based on the works of Prof. Kiril Dzhenev Kirov.

3. To analyze existing semantic models, their capacity and to prepare a basis for creating new semantic models for Bulgarian dance folklore.

4. The theoretical part should be implemented on an experimental one and an architecture and ontology of the selected samples should be created.

**The object** of the PhD thesis, on the one hand, is the creation of an ontology, and on the other hand, Bulgarian dance folklore, which defines the work as interdisciplinary, with a high degree of social significance.

## **II. Summary of the PhD thesis.**

The PhD thesis consists of 155 pages. Its structure includes four chapters, a conclusion, a bibliography, five appendices, and a declaration of originality of the results.

The first chapter, “Theoretical Analysis”, presents the introduction to the PhD thesis. Here, a theoretical analysis of the state of the research problem is made, the relevance of the topic is justified, the main goal is defined, and tasks for achieving it are formulated.

The second chapter, “Scientific Overview”, traces the progress in the scientific field and the motivation for the PhD thesis research. It defines fundamental concepts for the work such as ontology, semantic model, semantic web, semantic modeling through ontologies, ontological languages, and a standard for cataloging cultural objects. The software used for creating and managing ontologies – Protégé – is also presented. The emphasis in this chapter is placed on the virtual physical space (ViPS) as a concept that offers new ways of interacting with physical objects and spaces in a digital context. Other ontologies related to the cultural and historical heritage and developed within the team of the Plovdiv University are examined.

In the third chapter “Bulgarian Dance Folklore”, the specifics of Bulgarian dance folklore, which are important for the conducted research, are analyzed. The characteristics of Bulgarian folk dance are examined by folklore areas, the developed matrix of the qualification framework, which was used in the development of the ontology, is also presented. In this chapter, 10 of the works of Prof. Kiril Dzhenev are also studied.

Chapter four, “Architecture and prototype of an ontology of Bulgarian dance folklore”, focuses on the process of developing a hierarchy of Bulgarian dance folklore and a prototype of the ontology. A visualization of the dances is presented, in relation to the theoretical analysis presented in chapter two, and the metric data of the ontology of Bulgarian dance folklore are described.

The relationship between the chapters is ensured by the logic of the exhibition and allows for a thorough understanding of the scientific research.

The cited sources are sufficiently diverse and for the most part they are written by foreign authors. The presence of Bulgarian authors in the literature used also makes a good impression.

### **III. Evaluation of the PhD thesis's contributions.**

During the achievement of the main goal and solving the tasks related to it, the following main results were obtained, and in summary:

1. Research and detailed interdisciplinary analysis of the problem area, which will initiate deepening of the interaction between the Plovdiv University “Paisii

Hilendarski” and the Academy of Music, Dance and Fine Arts “Prof. Asen Diamandiev” - Plovdiv.

2. Development of a model for adequate structuring of artifacts related to Bulgarian dance folklore. The Bulgarian Dance Folklore Knowledge Repository extends the adaptation of the ViPS reference architecture for digitization of Bulgarian cultural and historical heritage.

3. Creation of an ontology prototype using modern semantic modeling methods and ontology standards, which allows automated data processing for storage and distribution. The prototype can be used primarily for solving research problems and training students.

I accept that the contributions so formulated could be considered to have scientific and common application. This separation would allow detailing the results obtained in accordance with the specificity of their significance.

#### **IV. Assessment of the submitted publications.**

The presented list of publications on the PhD thesis includes two publications that are referenced in the global databases SCOPUS and Web of Science. All publications are co-authored.

One publication was included in the proceedings of the international conference “Digital Presentation and Preservation of Cultural and Scientific Heritage” of the Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences and one was included in the proceedings of the international conference “International Conference Automatics and Informatics”.

The quality of the presented works has been proven by their publication in proceedings of renowned international conferences. The data presented in this way give me reason to conclude that the research has been provided with the necessary publicity among the scientific community.

#### **V. Evaluation of the PhD abstract.**

The PhD abstract is consisting of 32 pages. It reflects the essence and content of the dissertation, including the purpose, subject, object and tasks of dissertation research and the ways of their realization.

## **VI. Remarks and recommendations.**

In order to form the final evaluation of the PhD thesis, the requirements of the *Development of Academic Staff Act in the Republic of Bulgaria* and its Implementation Rules are to be taken into account, according to which I have the following remarks and recommendations:

1. Style errors are noted in the text of the PhD thesis.
2. The formulation of the PhD thesis contributions does not allow emphasizing the individual contribution of the PhD student.
3. The PhD student should direct his efforts to increase her contributions to reputable international publications.

## **VII. Conclusion.**

I accept that the requirements of the *Development of Academic Staff Act in the Republic of Bulgaria* and the specific requirements in the Act's Institutional Regulations for its implementation, the Rules for the conditions and the order for acquiring academic degrees and the Rules for the specific conditions for acquisition of academic degrees and occupation of academic positions at the Plovdiv University "Paisii Hilendarski" are accomplished.

After my introduction to the PhD thesis and its publications, an analysis of their significance and the contributions they make, I give my positive assessment and I recommend to the Honorable Jury to award the educational and scientific degree "Doctor of Philosophy" (PhD) to **Tsvetomira Ivanova Kazashka** in the Scientific Field **4. Natural Sciences, Mathematics and Informatics**, the Professional Area **4.6. Informatics and Computer Sciences**, the Scientific Specialty **Informatics**.

05.03.2025

Sofia

Signature: .....

/Corr. Member Lyubka Doukovska/