

OPINION

by **Associate Professor Vanya Angelova Ivanova, PhD,**
University of Plovdiv “Paisii Hilendarski”, Plovdiv

of a dissertation for awarding the educational and scientific degree “**Doctor**”

Field of higher education: 4. Natural sciences, Mathematics, and Informatics,

Professional field: 4.6 Informatics and Computer Science

Doctoral program: Informatics

Author of the dissertation: Kristian Nedelchev Milev

Topic: Intelligent Personal Tourist Guide

Scientific supervisor: Prof. Asya Georgieva Stoyanova-Doycheva, PhD

1. General presentation of the procedure and the doctoral student

By order № RD-21-906 of 26 April 2024 of the Rector of the University of Plovdiv “Paisii Hilendarski”, I have been appointed as a member of the scientific jury to participate in a procedure for the defense of a dissertation on the topic of “ Intelligent Personal Tourist Guide” for acquiring the educational and scientific degree “Doctor” in field of higher education: 4. Natural sciences, Mathematics, and Informatics, professional field: 4.6. Informatics and Computer science, doctoral program: Informatics. The author of the dissertation is Kristian Nedelchev Milev – a full-time doctoral student at the Department of Computer Systems, with scientific supervisor Prof. Asya Georgieva Stoyanova-Doycheva, PhD, from the University of Plovdiv “Paisii Hilendarski”.

The set of materials presented by the doctoral student is per Article 36 (1) of the Law on the Development of the Academic Staff of the University of Plovdiv and includes the following documents on electronic media:

- An application form to the Rector for initiating a procedure;
- CV in European format;
- A protocol of the preliminary discussion in the department;
- An abstract in Bulgarian and in English;
- A declaration of originality and authenticity of the attached documents;
- A certificate of compliance with the minimum national requirements;

- A list of publications;
- A dissertation;
- A statement by the scientific supervisor;
- Copies of the publications on the topic of the dissertation;
- A document for the fee paid, as per the tariff.

The doctoral student has submitted 4 publications, 3 of which are in English and 1 in Bulgarian; three of the publications are referenced in SCOPUS and IEEE or Web of Science.

This set of documents complies with the requirements of the Act for the Development of the Academic Staff in the Republic of Bulgaria, the Rules for its implementation, and the Law on the Development of the Academic Staff of the University of Plovdiv “Paisii Hilendarski”. The dissertation was discussed and approved for defense at a department meeting on 29/30 April 2024 at the Department of Computer Systems at the Faculty of Mathematics and Informatics of the University of Plovdiv. The procedure for defending the educational and scientific degree “doctor” is organized according to the law. The dissertation and the author’s abstract correspond to the requirements of the Rules on the Conditions and Procedure for Acquiring Science Degrees and Holding Academic Positions at the University of Plovdiv.

The doctoral student Kristian Nedelchev Milev received his bachelor’s degree in 2012 majoring in Informatics at the University of Plovdiv “Paisii Hilendarski” and he received a master’s degree in “Software Technology” from the University of Plovdiv “Paisii Hilendarski” in 2014. From 2019 to 2022, he participated in a doctoral program in informatics at the University of Plovdiv “Paisii Hilendarski”, Faculty of Mathematics and Informatics, Department of Computer Systems, and was awarded the right of defense.

2. Relevance of the topic

In the context of contemporary tourism trends and technological advancements, Kristian Milev’s dissertation topic emerges as highly relevant. With the increasing prevalence of mobile devices and applications in travel, there is a growing demand for personalized and intelligent solutions. Intelligent tourist guides, utilizing modern architectures such as ViPS (Virtual Physical Space), offer potential avenues for delivering customized experiences tailored to the unique preferences and needs of tourists.

The exploration of this technology not only aims to enhance tourism services but also seeks to foster innovation within the industry. Initiatives like prototyping a mobile application with intelligent tourist guide functionalities and developing user profiling questionnaires represent significant steps towards the potential personalization of tourism services.

In an era characterized by rapid digitalization and technological advancement, the dissertation's focus on intelligent tourist guides is both timely and noteworthy. It contributes to ongoing discussions surrounding the evolution of tourism experiences, highlighting opportunities for more interactive and user-centered approaches.

3. Knowledge of the research problem

The dissertation delves deeply into its subject matter, showcasing Kristian Milev's thorough understanding of the topic. The first chapter extensively reviews existing research and developments within the realm of tourism applications and recommender systems. The author successfully synthesizes available information through methodical classification of various approaches and methods, offering valuable insights for future research.

The well-organized structure of the dissertation and clearly outlined objectives reflect the doctoral student's grasp of the problem at hand. Utilizing and citing literary sources appropriately, the doctoral student enhances the scholarly integrity of his work. Additionally, including illustrative material and the coherent flow between chapters and paragraphs demonstrate a comprehensive understanding of the subject matter and adept organization of information.

4. Characterization and evaluation of the dissertation work and contributions

The dissertation comprises 112 pages and the bibliography includes 126 sources. The dissertation consists of an introduction, three chapters, a conclusion, results of the scientific research, a list of four publications, and references.

The introduction provides an overview of the topic, outlining the study's scope, main approach, and objectives, while also discussing the research's significance and motivation.

Chapter 1 extensively reviews existing developments and research in tourism applications and recommender systems, categorizing and summarizing various approaches and methods.

Chapter 2 elaborates on the development of the tourist guide architecture, emphasizing personalization and adaptability to user preferences, alongside the creation of intelligent services in the form of microservices.

Chapter 3 focuses on the design and development of the presentation layer prototype, encompassing the creation of user profiling questionnaires, architectural solutions for user interfaces, and data collection methods.

In the concluding section, the dissertation summarizes achieved results, evaluates goal implementation, and offers insights for future project development, including suggestions for

enhancements and expanded functionalities.

5. Assessment of the publications and personal contribution of the doctoral student

The main results of the research have been published in journals and conference proceedings.

In total, there are four publications on the topic of the dissertation. One of the publications is in Bulgarian and the other 3 in English, which makes them accessible to a wide range of readers. Three publications are referenced in SCOPUS and IEEE or Web of Science and all of the doctoral student's publications are co-authored.

The submitted publications are proof of the good promotion of the results of the dissertation work and the doctoral student's ability to work in a team, assume responsibilities, and be accountable. The doctoral student's contribution to the publications is indisputable.

The number and quality of the publications meet the requirements of the Rules on the Conditions and Procedure for Acquiring Science Degrees and Holding Academic Positions at the University of Plovdiv and their content reflects basic results that are sufficiently presented to a specialized scientific audience.

6. Abstract

The abstract reflects the content and contributions of the dissertation and meets the requirements. Here, as in the dissertation work, the clear position of the author and the consistency and completeness in the realization of the set goals are evident.

7. Critical remarks and recommendations

I have no substantive critical remarks on the presented documents and works.

I would like to ask the PhD student the following question: **Is the prototype of the tourist guide expected to be implemented in practice and when will users be able to use it on their mobile devices?**

Some inaccuracies can be noted, such as:

- Lack of translation for certain terms from Bulgarian to English in the dissertation.
- Use of foreign terms when equivalent Bulgarian terms exist.
- Incorrect use of punctuation, such as missing or misplaced commas.
- Inconsistent use of terms for the same concept, such as "tourist guide" and "tour guide."

- Providing overly detailed descriptions, which can lead to redundancy or confusion.
- Inclusion of Bulgarian text within an English abstract.

I would like to emphasize that the remarks of a technical nature in no way affect the scientific value of the work. As a recommendation, I would encourage the doctoral student to consider publishing individual scientific papers as well.

CONCLUSION

The dissertation contains scientific-applied and applied results, which represent an original contribution to science and meet all the requirements of the Act for the Development of the Academic Staff in the Republic of Bulgaria (ADASRB), the Rules for the Implementation of the ADASRB, and the Rules on the Conditions and Procedure for Acquiring Science Degrees and Holding Academic Positions at the University of Plovdiv “Paisii Hilendarski”.

The dissertation work shows that the doctoral student Kristian Nedelchev Milev has in-depth theoretical knowledge and professional skills, demonstrating qualities and skills for independent conduct of scientific research.

Due to the above, I confidently give my **positive assessment** of the conducted research, presented by the above-reviewed dissertation work, abstract, achieved results, and contributions, and **I propose to the honorable scientific jury to award the educational and scientific degree “doctor”** to Kristian Nedelchev Milev in field of higher education: 4. Natural sciences, Mathematics, and Informatics, professional field: 4.6 Informatics and Computer Science, doctoral program “Informatics”.

20th May 2024

Reviewer:

Assoc. Prof. Vanya Ivanova, PhD