

REVIEW

by Prof. Dr. Petraq Jorgji Papajorgji

European University of Tirana – Albania

In connection with the procedure for defense of a dissertation on the topic *“Research Information System Services for the Open Science Cloud”* for obtaining the educational and scientific degree “Doctor”, the field of higher education: *4. Natural sciences, mathematics and informatics*, professional field: *4.6 Informatics and Computer Science, Doctoral Program “Information Technologies”- Computer Networking*, the department of “Information Technologies” at FMI SU “St. Kliment Ohridski”

Candidate: Silvester Mustafa Hasani

This review is presented based on the order of the Rector of Sofia University “St. Kliment Ohridski” With No. RD 38-173 / 31.03.2022 for the defense of a dissertation. It has been prepared based on the Law and its implementation; the Regulations for its implementation; and the Regulations for the conditions and procedure for acquiring and holding academic positions at Sofia University “St. Kliment Ohridski”.

As a member of the scientific jury, I have received all the required administrative and scientific documents for the candidate:

- dissertation in English,
- abstract in English and Bulgarian to the main dissertation,
- diplomas of higher education (Bachelor’s and Master’s degrees),
- CV of the candidate
- order for enrollment in the doctoral program,
- passed exams in the curriculum,

- report from the supervisor on readiness for defense of the dissertation,
- declaration of authorship of the dissertation,
- protocol and opinion of the supervisor on the verification of the originality of the dissertation,
- reference to the minimum national requirements as well as documents providing the declared points.
- list of the articles attained conference of the Ph.D. student and scientific papers related to the dissertation.
- minutes of the first meeting of the scientific jury appointed by order of the Rector No. RD 38-173 / 31.03.2022 for the defense of the dissertation.

The candidate meets the criteria of Sofia University “St. Kliment Ohridski” for participation in the competition, and he was admitted to the defense of the dissertation.

1. Personal data about the candidate

Silvester Mustafa Hasani was born in 1992. He graduated with honors from Harry T. Fultz Technical High School in 2011 for Electronic Engineering, a Bachelor’s Degree from the Faculty of Information Technology, the Polytechnic University of Tirana in Albania for Telecommunications Engineering. He graduated with distinction from the Master’s program in Computer Science with a specialization in Networking at the University of New York Tirana in Albania. He has worked full-time for four years at the University of New York in Tirana as an assistant lecturer and invited lecturer to several other universities in Albania. He also kept close connections to the industry in Albania by working as a full-stack web developer and lately as a technical consultant in SAP. He is now a technical consultant in an international team in SAP and a lecturer at Barleti University in Albania. In 2019, he was enrolled as a part-time Ph.D. student at FMI at Sofia University “St. Kliment Ohridski” in the doctoral program Information Technologies. The dissertation field is a deviation from the usual field of study he researches. However, he found the topic of interest and got involved in it. During the Ph.D. program, he has participated in 6 international scientific conferences, of which four are closely connected to the dissertation work.

I have the pleasure to know Mr. Hasani personally since we have worked together for one year at the University of New York Tirana. During this time, I only heard excellent reviews about him from his head of department. He was the best graduate student in his cohort and was invited to work as an assistant lecturer after finishing his master's degree. He was a good colleague and provided a lot of energy to the team.

2. General characteristics of the scientific work related to the dissertation of the candidate

In this dissertation work, the author has helped the reader with a proper understanding of the Open Science. The presented work is well written and, in my opinion, it is a pleasant read. The main goal of the thesis is to provide services for the Open Science Cloud, which is implemented by proposing the architecture of the prototype of the Albanian Open Science Cloud.

Open Science has been a relatively hot topic recently, and this dissertation provides insight for all the researchers diving into Open Science. To understand the work in more detail, the candidate first considered introducing Open Science and all its elements in detail. Thus, proper definitions and in-depth reviews of the elements are presented.

After that, the author analyzed the European Open Science Cloud to demonstrate a good orientation and knowledge of the stages of the modern development of Open Science in Europe. Based on this knowledge, a solution is proposed for a repository for developing the Open Science Digital Repository.

One of the contributions of the dissertation topic is the dissemination of an Open Science questionnaire in Albania and Bulgaria. This questionnaire identifies the stages in the transition to Open Science in the country and gives the reader a proper understanding of the Albanian and Bulgarian views on Open Science.

The main contribution of the dissertation is the prototype of the Albanian Repository. The author presents the prototype, explains in detail its main characteristics of it, and gives the architecture on how to develop a new repository following the European standards set by the European Open Science Cloud. The author provided proof that Albania is in the first steps toward the transition of Open Science, and designing the architecture of the prototype of a repository is needed.

The objectives of the dissertation thesis are clearly described and achieved. The objectives are:

- analyzing Open Science development in Europe;
- exploring the European view on Open Science: European Open Science Cloud;
- identifying the stages in the transition to Open Science and the main problems faced by Balkan universities;
- describing the next steps for implementing and deploying Open Science in Albania;
- developing a prototype of open science repository, following the European standards set by European Open Science Cloud;
- deploying this prototype to support such a transition to open science in Albania;
- developing an Open-Science Policy to be implemented in Albania.

3. Structure and content of the dissertation

This dissertation work comprises five chapters, 20 tables, 12 figures, Appendix with a survey developed to investigate the status of Open Science in Albania. It consists of 55 references to articles and web pages.

The work is organized as the following:

- Acknowledgments
- Chapter 1 – *Introduction*: The author introduces Open Science and all the main elements of Open Science. Also, this chapter introduces the needed definitions and discusses an in-depth overview of each element.
- Chapter 2 – *State of Open Science in Europe*: The author analyzes the European view on Open Science. The European Open Science Cloud is introduced, digital repositories are assessed, and the author identifies the most suitable way of implementing Open Science.
- Chapter 3 – *The current state of Open Science in Balkan*: The author investigates the stages of the Open Science transition in the region by using the survey in Appendix A. The author investigates the results and proposes the first prototype for Open Science for Albania.

- Chapter 4 – *Albanian Open-Source Digital Library*: In this chapter, the author describes the Albanian Open Science Repository development. He also shows the data model and the design of the repository that is being developed. The author starts with all the required prerequisite software and the deployment of the software used for the repository, and lastly, he develops an Open Science Policy.

- Chapter 5 – *Conclusions*: In this chapter, the main conclusions of the dissertation work are as stated, followed by the scientific, applied, and scientific and applied contribution of the dissertation. All the related scientific publications related to the dissertation work are listed, and future works are presented.

- Bibliography: A list of 55 references to articles and web pages related to the dissertation topic.

- Appendix A: The survey the author uses to investigate the current state of Open Science in Balkan

- Declaration of originality

4. Scientific papers published by the doctoral student in direct connection with the dissertation

- S. Hasani, E. Stefanova, K. Stefanov, A. Georgiev, ARE WE READY FOR OPEN SCIENCE - THE ANSWER OF THE BALKAN UNIVERSITIES, ICERI2020 Proceedings, Publisher: IATED, 2020, pages: 1947-1953, ISSN (print): 2340-1095, ISBN: 978-84-09-24232-0, doi: 10.21125 / iceri.2020.0481, International 2020.
- S. Hasani, E. Stefanova, A. Georgiev, K. Stefanov, Current State of Open Science in Balkan Universities, Proceedings of the International Conference Automatics and Informatics (ICAI2020), Publisher: IEEE, 2020, pages: 1-6, ISBN: 978-1-7281-9309-0, doi: 10.1109 / ICAI50593.2020.9311337, Ref, IEEE Xplore, International, PhD.
- S. Hasani, E. Stefanova, A. Georgiev, K. Stefanov, OPEN SCIENCE IN ALBANIA: FIRST OPEN-SCIENCE POLICY IMPLEMENTED IN ALBANIA, EDULEARN21 Proceedings, Conference name: 13th International Conference on Education and New Learning

Technologies, Dates: 5-6 July, 2021, Pages: 12267-12271, ISBN: 978-84-09-31267-2, ISSN: 2340-1117, doi: 10.21125/edulearn.2021.2575.

- S. Hasani, E. Stefanova, A. Georgiev and K. Stefanov, "First Steps towards Open Science in Albania" 2021 International Conference Automatics and Informatics (ICAI), Varna, Bulgaria, 2021, pp. 235-238, doi: 10.1109/ICAI50593.2020.9311337, ISBN: 978-1-6654-2662-6, e-ISBN: 978-1-6654-2661-9, 10.1109/ICAI52893.2021.9639622.

The publications related to the dissertation thesis fulfill the minimum national requirements (under Art. 2b, para. 2 and 3 of ZRASRB) since two of them are indexed in SCOPUS, and respectively the additional requirements of Sofia University "St. Kliment Ohridski" for obtaining a Ph.D. degree in the scientific field and professional direction of the procedure.

5. Evaluation of the scientific and practical results and contributions in the publications submitted for the competition

After carefully reading the presented work, my judgment is the candidate used peer-reviewed literature from scientifically validated sources, making the dissertation research up-to-date and legitimate. The work is written at a high professional and academic level containing the necessary depth and originality to be considered of high level. The work shows a specific practical orientation that has the potential to lead to future implementations using the solution provided in the dissertation. There is no legally proven plagiarism in the submitted dissertation and the scientific papers on this procedure. Due to the stated facts, I give the highest grade to the candidate.

6. Quality of the Abstract

The abstract is detailed enough to understand the dissertation work. I agree that it correctly reflects the results and the dissertation's contributions. The abstract does not explain the prerequisite software and deployment of the repository with the exact details as the dissertation work. However, it gives a general idea of the repository deployment.

7. Remarks and recommendations

The remark I have on the dissertation work is related to the Open Science Policy. This policy is dependent on the repository developed during the dissertation work; however, the author describes all the steps necessary for creating any repository with the same characteristics to be compliant with European Open Science Cloud. Some private institutions in Albania might prefer to deploy another repository and apply an independent Open Science Policy that is not bound to the one developed during the dissertation work. The potential discrepancy between the Open Science Policy selected in this work and future non-compliant criteria followed by private companies could be a good reason to expand Open Science rapidly in other Albanian research institutions.

8. Conclusion

Based on the previous comments about the presented materials quality, scientific papers, their significance, and the scientific and applied contributions, I believe that the candidate *Silvester Mustafa Hasani* meets all the requirements, rules for the implementation, Regulations for the conditions, and the order for acquiring the educational and scientific degree "Doctor" at Sofia University "St. Kliment Ohridski" in the professional field 4.6 Informatics and Computer Science. **I give a positive assessment** to the candidate. **I recommend** to the esteemed Scientific Jury to award Silvester Mustafa Hasani the scientific degree of Doctor in Professional Field 4.6. "Informatics and Computer Science" at Sofia University "St. Kliment Ohridski".

Sofia, 31.05.2022

Reviewer:

Prof. Dr. Petraq Jorgji Papajorgi
European University of Tirana