STATEMENT

by Prof. PhD Desislava Ivanova
Technical University of Sofia

Dissertation of ***Peter Pashinov Sabev*** on the subject:

"Securing Data during Storage, Management and Transfer between Mobile Devices"

presented for the acquisition of the educational and scientific degree "Doctor"
in PF 4.6 Informatics and computer sciences
Doctoral Program: "Software Technologies" - Software Engineering

1. Dissertation Structure and relevance of the problem.

The dissertation of Petar Pashinov Sabev is presented in 5 chapters. The main text is written on 168 pages. The number of figures is 44, and the total number of tables is 8. Four appendices have been added to the dissertation, visually presenting graphs, diagrams, data and results of studies and experiments, including a dictionary of the main terms and abbreviations (sorted alphabetically). The total number of cited literature sources is 289, including citations to scientific works of independent researchers in the field of security, books, standards, websites, and other sources. The dissertation research, analyses and assesses the security of highly secure software for mobile devices, examining the effectiveness of data protection during its life cycle, including specialized approaches, methods, and architectural solutions for designing and developing highly secure software.

The topic and field of the dissertation is current.

2. Degree of knowledge of the state of the problem and compliance of the chosen research methodology with the set goals and objectives.

The first chapter outlines the topicality of the problem under consideration, presenting the main subject and object of research in the dissertation work, indicating the main goal of the dissertation work, and setting the tasks resulting from this goal. This chapter also describes the expected benefits of the fulfilment of the main goal of the dissertation work and the resulting tasks. ***In the second chapter***, a summary of the current state in the researched area is offered. Analyses performed relevant to the presented study are described, including basic definitions and formulations to support further research and experimentation. ***The third chapter*** presents

a case study of highly secure software from a security point of view. For the researched highly secure software, a comparative analysis and security assessment are presented, prepared based on specifically defined and described security criteria, a research methodology is defined, and a comparative analysis and security assessment of highly secure software is made. ***The fourth chapter*** examines the effectiveness of data protection in the context of implementing highly secure software. It presents the results of accompanying research experiments, digital investigation, benchmarking, and evaluation of data protection effectiveness. ***The fifth chapter*** presents the main activities carried out to achieve the main goal of the dissertation work and the tasks resulting from this goal. In addition, the chapter describes the main contributions of the dissertation and related publications and reports. The main plans for future development are also described.

All this shows that Petar Pashinov Sabev knows the state of the problem, as the goals and tasks set in the dissertation correspond to the chosen research methodology.

3. Contributions

I accept the contributions in the dissertation, which can be divided into *scientific, scientific-applied and applied.*

Scientific Contributions:

1. A methodology for investigating, comparative security analysis and in breadth security evaluation of HSS at a high-level is defined; (Chapter 3)
2. A main memory inspection methodology regarding the efficiency of in-memory data protection in the context of HSS execution is defined; (Chapter 4)

Scientific and Applied Contributions:

1. A process has been proposed for applying sets of security evaluation criteria, with the aim of using it for comparative analysis and evaluation of the security of existing HSS of the PMS/DVS type; (Chapter 3)
2. The applicability of the methodology for investigating, comparative security analysis and in breadth security evaluation of HSS at a high-level has been validated by applying it to study, security compare and in breadth security evaluate a representative sample of PMS / DVS; (Chapter 3)
3. Specific security evaluation criteria regarding the efficiency of in-memory data protection in HSS, as well as specialized usage scenarios to support the conduct of the experiments, are defined; (Chapter 4)

4. A digital investigation is conducted to examine the effectiveness of in-memory data protection in the context of HSS execution, then an analysis of the results obtained is performed, and a security evaluation regarding the effectiveness of data protection in main memory is prepared; (Chapter 4)
5. The applicability of the main memory inspection methodology about the efficiency of in-memory data protection in the context of HSS execution is validated by applying it to study, security compare and in breadth security evaluate a representative sample of PMS / DVS according to specific security evaluation criteria; (Chapter 4)

Applied Contributions:

1. A specialized software tool for supporting the conduct of digital investigation, analysis, and security evaluation regarding the effectiveness of data protection in main memory in the context of HSS execution has been designed and developed; (Chapter 4)

4. Publications on the dissertation

Petar Sabev has submitted one article in a scientific journal, two articles published in proceedings of international conferences, one of them is indexed in Scopus and a chapter in a book published by Cambridge Scholars Publishing. All publications are presented at reputable scientific forums. Two citations are also presented.

The publications presented by Petar Sabev fully cover the requirements for obtaining the educational and scientific degree "Doctor" in PF 4.6 Informatics and computer science.

5. Opinions and recommendations

The dissertation is written at a very good level. The abstract contains the main information and accurately and clearly reflects the contributions in the dissertation thesis.

6. Conclusion

The presented dissertation meets the set of criteria and indicators for the acquisition of the educational and scientific degree "Doctor", according to the Law on the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB) and the Regulations of SU "St. Kliment Ohridski" for the implementation of ZRASRB.

I recommend to the scientific jury to award Peter Pashinov Sabev the educational and scientific degree "Doctor" in professional direction 4.6 Informatics and computer sciences, doctoral program: "Software technologies" - Software engineering.

Date: 23.05.2024 Jury Member: .....
Sofia Prof. PhD Desislava Ivanova