

## **REVIEW**

**About PhD defence thesis entitled:**  
*„Distributed Control of Conveyer Systems“*

**by**

**Ivailo Todorov Andonov**

**Faculty of Mathematics and Informatics**

**Sofia University “St. Kliment Ohridski”,**

This review is prepared by: **assoc. prof. Aleksandar Dimov, PhD** (Sofia University) as a member of the scientific committee according to order No. *RD-38-125 / 26.02.2021* issued by the Rector of Sofia University.

### **1. 1. General characteristics of the PhD thesis**

The text of the dissertation consists of 93 pages, which include an Introduction, 4 main chapters, a list of figures, with 76 items and a list of references with 51 titles.

The following materials have been provided for the dissertation defence procedure:

- Curriculum Vitae
- A copy of MsC degree diploma
- Text of the dissertation
- Synopsis written both in Bulgarian and English languages
- Information on the minimum national requirements for receiving a PhD degree
- Published scientific papers related to the dissertation
- Patent certificate
- Orders for enrollment in full-time doctoral studies at Sofia University “St. Kl. Ohridski ”and for finishing the studies with the right for defense
- Certificates for passed exams
- Authorship declarations and plagiarism verification documents

The submitted documents comply with the requirements according to National and University legislations for admission to PhD defence.

## **2. Information and personal impressions about the candidate**

The candidate – Ivaylo Andonov, finished his Master's degree in 2008 at the Technical University of Sofia, in Automation, Information and Control Engineering. In 2018 he was enrolled in full-time doctoral studies at Sofia University "St. Kliment Ohridski". His professional experience is over 20 years, mainly as an electronics engineer.

I slightly know the candidate since the middle of 2019 when I was part of the commission for the main doctoral exam in his individual studies plan. I also have some impressions as a participant in scientific conference, where he has a presentation of one of his papers. Although I have no direct observations on his work, my impressions are of good knowledge and experience in the field of his dissertation.

## **3. Analysis of the contributions**

The candidate claims for 6 contributions, all in the field of distributed conveyor management. According to the materials and dissertation submitted before the deadline, I may admit the following 4 of them:

- Creation of a method for management of distributed conveyor systems
- Creation of a model for computer simulation of the proposed method
- Methods for improving the performance of the subsystems for measurement, supply and communication of distributed conveyors are proposed
- Development of a prototype conveyor system

These contributions are also included in the publications provided by the candidate for the defence procedure.

It should be noted that the other contributions, claimed by the candidate (about the simulation and verification and validation of the proposed method), may be admitted, but more quantitative evidence and results and analysis of experiments are needed.

I find as a good contribution of the candidate, his work in the field of protection of hardware elements against cloning, although they are not in the scientific field of doctoral studies.

All contributions of Ivaylo Andonov should be considered as practically applicable (i.e. not theoretical).

#### **4. Assessment of the thesis publications**

The candidate has provided four publications, one of them is and is in Bulgarian language and is authored only by him. The other three publications are in English and co-authored with his supervisor. Two of the publications provided have been published in IEEE conference proceedings indexed in SCOPUS and one is in a peer-reviewed journal.

As mentioned in the previous section of this review, the main contributions of the thesis are published in the above-mentioned articles. The candidate also participates in a patent that includes some of his dissertation results.

There is no legally proven plagiarism in the submitted dissertation and scientific papers of the candidate.

The materials submitted for the defence procedure satisfy the minimum quantitative national and university legislation requirements for acquiring the educational and scientific degree “Doctor” in professional field 4.6. “Informatics and Computer Science”.

#### **5. Assessment of the thesis synopsis**

The abstract is submitted both in Bulgarian and English languages and sufficiently presents the results and content of the dissertation.

#### **6. Critical remarks and comments**

The main critical remarks are towards the text and layout of the dissertation. Its most serious drawback is the lack of sufficient analytical introduction and theoretical-in-depth review.

Another disadvantage of the thesis is the lack of justification of the neural networks and software agents described in the introduction with the methods developed by the doctoral student. This way it leaves the impression of a purely hardware contribution.

Additionally, there is a lack of descriptions in the text of the thesis, for example – new terms not described upon their first occurrence, insufficient justification of the statements and lack of analytical conclusions to analyse the research done by the doctoral student. More specifically:

- It is not absolutely clear what does MR mean in the title of item 1.7
- The purpose of section 2.5 for the dissertation is vague.
- What is the relationship of the method for securing of devices against cloning, described in Chapter 2 with the rest of the dissertation?
- It is necessary to better justify the connection of experiments described in chapter 3 with the rest of the dissertation.

- There exists mismatch in the cited references, with respect to the relevance of the contents of the paper and the purpose of the citation, for example, on page 60 - source [39].

I recommend, in his future works the candidate to be more in-depth with respect to description and justification of his contributions.

## **7. Conclusion**

After getting acquainted with the submitted thesis and corresponding materials, with respect to the work done by the candidate and despite the critical remarks, I consider the thesis to fulfil the requirements for PhD degree of the Bulgarian law and corresponding state and university regulations. Thus, I recommend that Ivailo Andonov should be given a PhD degree in field of 4.6. Informatics and Computer Science.

05 May 2021

Reviewer:

(assoc. prof. Aleksandar Dimov, PhD)