

# ATTITUDE

on dissertation work for the acquisition of educational and scientific degree "doctor"  
in a professional field: 4.6 Informatics and Computer Science

*Author of the thesis: Ivailo Todorov Andonov*

Thesis title:

***DISTRIBUTED CONTROL OF CONVEYER SYSTEMS***

Member of the Scientific Jury:

***Assoc. Prof. PhD Desislava Ivanova***

Technical University of Sofia

## **1. Relevance of the problem**

The presented dissertation consists of 4 chapters, contributions, list of publications, declaration of originality and bibliography. The dissertation is in a total volume of 99 pages, 76 figures and 51 cited literature sources. The main goal of the dissertation is to develop a solution for improving the efficiency of conveyor systems by applying new methods of distributed control. The dissertation proposes solutions for distributed management, where the zones are considered as software agents, which through their own behavior strive to improve the global characteristics of the whole system and allow to reduce the total cost of the system. The research area is relevant.

## **2. Degree of knowledge of the status of the problem and responsibility of the chosen research methodology and set goals and objectives**

The first chapter analyzes the subject area and defines the goals and objectives of the dissertation. The second one suggests a solution for distributed control while considering each zone as software agent, which with its own behavior is trying to make the global system parameters better. Some solutions for improvements of the power supply system, distance measurement and communication are provided.

The third chapter deals with the implementation of the suggested solutions and their system integration. The last chapter is about testing and evaluation of the results of the system by doing experiments. It is divided on two parts where in the first the results of the separate units testing is shown and in the second one, the whole system integrating all the solutions is

evaluated and verified. **Conclusion:** *Ivailo Todorov Andonov shows a high level of knowledge in the scientific field, as the goals and tasks set in the dissertation fully correspond to the chosen research methodology.*

### **3. Contributions**

The contributions in the dissertation can be divided into scientific and applied:

#### **SCIENTIFIC:**

1. Research analysis of the methods and techniques for control of the conveyer systems.
2. Proposed solution for improving the efficiency of the conveyer systems by using advanced method for distributed control.
3. Proposed new methods for enhancing the subsystems for measuring, power supply and communication.
4. Modeling and computer simulation of the proposed method for distributed control.

#### **APPLIED:**

5. Design and implementation of the prototype for testing the functionality of the proposed solutions.
6. Test cases for verification and evaluation the effectiveness of the methods, which confirm the achieved level of improvement in reliability and performance.

### **4. Dissertation publications**

Ivailo Todorov Andonov presented 5 publications related to the dissertation. All publications are presented at renowned scientific forums. Two of the publications have been published in scientific journals and the other three papers have been published in international conference proceedings – 2 of them are presented in the frame of IEEE-IS. ***The publications presented by Ivailo Todorov Andonov fully cover the requirements for obtaining the educational and scientific degree „doctor“.***

### **5. Opinion and recommendations**

The dissertation is written at a very good level. The abstract contains the basic information and accurately and clearly reflects the contributions to the dissertation.

#### ***Recommendations:***

1) It would be good to present in the dissertation a generalized experimental framework to present clearly, precisely, and clearly:

- ✓ The software and hardware part of the research in the dissertation.
- ✓ The levels of application of the proposed new methods and techniques and their contribution to the overall functionality of the distributed system.

**Questions:**

- ❖ Could you please present sample data from the comparison of distributed control of conveyor systems before and after the application of the new distributed control methods proposed in the dissertation?
- ❖ Which parameters are most affected?
- ❖ What are the possibilities for reacting to unforeseen events?

## **6. Conclusion**

The presented dissertation fully corresponds to the set of criteria and indicators for the acquisition of educational and scientific degree "Doctor", in accordance with the Law for the development of the academic staff in the Republic of Bulgaria, the Rules for its implementation and the Rules for the conditions and procedures for the acquisition of scientific degrees and academic positions at the Sofia University "St. Kliment Ohridski".

***I recommend that the scientific jury award Ivailo Todorov Andonov the Doctorate degree in professional field 4.6 Informatics and Computer Science.***

Date: 05.05.2021  
Sofia, Bulgaria

JURI MEMBER: .....  
Assoc. Prof. PhD Desislava Ivanova