STATEMENT OF OPINION

from **Prof. D.SC. Eng. Seferin Todorov Mirtchev**
at the academic position of "professor" in a professional field
5.3. Communication and Computer Engineering
at the Technical University - Sofia
for
obtaining the scientific degree of "doctor",
with candidate **mag. Eng. Krasnomir Milkov Krachunov**
in a scientific specialty "Telecommunications" in a professional field
5.3 "Communication and Computer Engineering"

Topic of the dissertation work:
"Knowledge modelling for the needs of intellectual systems"

The presented dissertation work for my opinion is 223 pages long and contains an introduction, 7 chapters, contributions and perspectives, publications on the topic, 2 applications, a list of used terms, cited literature with 71 references and a list of diagrams, figures and tables.

1. Significance of the researched problem in scientific and scientific-applied relation.

We live in a knowledge society based on the widespread use of information and communication technologies and cyber-physical systems. The modern global economy is extremely dynamic and changeable. The knowledge plays a key rôle and becomes an important resource and source of the highest quality.

For many decades, there has been a growing interest in information and knowledge, in information and intellectual systems and, accordingly, an extremely large number of research and publications related to them.

In this light, the attempt to model knowledge for the intellectual systems in the dissertation work is a topical and significant problem, both in scientific and scientific-applied aspects.

2. Validity of the goals and tasks in the dissertation work.

The aim of the dissertation work is to find the availability of general knowledge that serves, partially or completely, as a starting point in the knowledge modelling of different intellectual systems. For this goal the following tasks must be solved: to determine the place of general knowledge in a formal presentation; to arrange the general knowledge in a certain system for building models; to find an appropriate and convenient way to present the general knowledge for use in communication and computer technology.

In order to achieve these goals, it is necessary to separate the general phenomena from

the many known and studied phenomena and, as far as possible, to find and build a system in which these general phenomena are connected in certain ways. It is important for the research to substantiate and present the statement that there are a finite number of phenomena, which meet certain conditions and are suitable in knowledge modelling for different intellectual systems.

The object of study of the present dissertation emphasizes the validity of the goals. The subject of research are the general phenomena in nature, which happens through their features, characteristics and traits. In the process of knowledge production, these characteristics become properties, relations, qualities and quantities, functions, interactions, states, movements, etc.

3. Correspondence between the chosen methodology and research methodology and the set goal and tasks of the dissertation.

The chosen methodology and research methodology correspond to the set goal and tasks of the dissertation. It is used in it different approaches and tools - research, analysis, definition, summaries and conclusions.

The research is an attempt to separate the general phenomena from the infinite number of phenomena, to find and build a system of knowledge in which these general phenomena are connected in certain ways.

With regard to natural science knowledge, those unprovable and irrefutable propositions that perform the functions of axioms or accepted propositions are indicated and arranged in a system. A model of these axioms is constructed.

4. Scientific and scientific-applied contributions of the dissertation work (description and evaluation).

In general, I accept the seven theoretical and methodological contributions of the dissertation indicated by the doctoral student.

From an engineering point of view, the scientific-applied contribution is the experience and diligence to indicate general knowledge, which serves as a starting point in the knowledge modelling for different intellectual systems. As a result, a large number of diagrams, tables and figures can be indicated. It should be noted that the research is presented with an emphasis on the philosophical side.

An analysis of the current situation on the topic and a logical justification of the study is made. The ways for formalization of knowledge and the use of abstract and ideal objects in knowledge processing are considered. The application of the general provisions in the field of nature is shown. The areas of knowledge application and the logics by which knowledge is built and expressed are indicated. The communication is evaluated as a scheme for knowledge transfer. The possibility of using the model of general provisions in the development of various projects for smart cities, specifically for traffic regulation, is considered. Applications are presented with examples of the use of general provisions for knowledge development.

5. Estimation of the publications on the dissertation work: number, nature of the publications in which they are published.

Six publications on the dissertation work are presented. Two at conferences Automation of Discrete Production at the Technical University - Sofia, one at the conference Ecology of NBU, one in the magazine Engineering Design and two in the Yearbook of the Department of Telecommunications at NBU.

6. Citation from other authors, reviews in the scientific press, etc.

It is not marked citations and reviews from specialists and leading companies in the scientific press.

7. Opinions, recommendations and notes.

The author demonstrates in-depth knowledge in the field of dissertation. It is noteworthy that in addition to the engineering side, the doctoral student also focused on the philosophical side of the topic.

Most authors of publications related to knowledge and intellectual systems emphasize and on the concept of information, which is fundamental for the telecommunications and computer technology. This has not been done in the dissertation.

The main task of the dissertation is modelling. In it, the processes of modelling and creating models are left in the background or they are talked about indirectly. I want to point out that in the creation of engineering models (mathematical and experimental) an essential feature are the assumptions and simplifications. In the dissertation, the modelling is described in general, mainly from a philosophical point of view.

Notes:

In the dissertation, the goal of the research is relatively precisely defined, and in the author's summary of dissertation, which is with open access, the description of the goal is general.

The author has focused on the descriptions and has left in the background the conclusions, the obtained results, the deductions and the contributions.

Page 28. Fig. 1, and the first fig. is 2.1.

Page 62. It is claimed that with a finite number of phenomena are built composite phenomena, the number of which, at least theoretically, tends to infinity. "There are a certain, finite number of phenomena, which through various combinations, depending on the conditions and the situation, build the other, already composite phenomena, the number of which, at least in theory, tends to infinity."

Page 122. "At this level of consideration, the nature is an infinite set of finite natural parts - natural objects and manifestations of natural objects."

Page 182. "Purpose of this 'article' ...".

8. Conclusion with clearly formulated positive or negative assessment of the dissertation work.

The topic of the dissertation work is significant. The author is thoroughly acquainted with the research area and with the research methods.

The presented dissertation for defence, abstract and publications on the dissertation, as well as the overall professional and scientific work of Eng. Krasnomir Krachunov show that the requirements of the Law for the Development of Academic Staff in the Republic of Bulgaria (ZRASRB), the Regulations for its application, as well as the internal normative base of NBU for awarding educational and scientific degree "doctor" are met.

Keep in mind the above, I propose to the scientific jury to support the award of the educational and scientific degree "Doctor" of Eng. Krasnomir Milkov Krachunov in the professional field 5.3. "Communication and computer engineering".

April 12, 2022

Signature:

/Prof. Seferin Mirtchev, DSc/