

TECHNICAL UNIVERSITY – VARNA

OPINION

from **Assoc. Prof. Dr. Eng. Diyan Zhelev Dinev**

regarding a dissertation for the award of the educational and scientific degree “Doctor”
in the PhD program “**System Programming**”
professional field 5.3 “**Communication and Computer Technology**”

Author of the dissertation: **Eng. Dimitar Nikolov Todorov**

Dissertation title: “**Methods and Tools for Load Balancing and Improving the Quality of Services in Software-Defined Networks**”

1. Relevance of the Problem Addressed in the Dissertation

Software-Defined Networking (SDN) and Network Function Virtualization (NFV) have become leading approaches in the design and management of modern communication infrastructures. The logically centralized control and the programmability of SDN create prerequisites for deploying more efficient mechanisms for routing and load balancing, especially under dynamically changing network conditions.

In the context of increasing Quality of Service (QoS) requirements and the resilience of network services, the research and development of static and dynamic traffic-management algorithms in SDN networks is a timely scientific-applied problem. The presented dissertation addresses this need through proposed algorithms, evaluation criteria/indicators, and experimental validation in a controllable research environment.

The goal of the dissertation is to develop and investigate methods and tools for load balancing and improving the quality of services in SDN-based networks through:

- proposing algorithms for static and dynamic traffic routing;
- defining a system of indicators for evaluating routing algorithms and SDN controllers;
- developing an SDN controller for experimental investigation and comparative evaluation of the proposed solutions.

2. Contributions of the Dissertation

I accept the contributions presented in the dissertation as follows:

Contributions of a scientific nature:

- A static traffic routing algorithm for SDN networks is proposed, providing balanced traffic distribution and improved quality of services.
- A dynamic traffic routing algorithm for SDN networks is proposed, in which network traffic is managed according to network load.

Contributions of a scientific-applied nature:

- A system of indicators is defined for evaluating static routing algorithms in SDN-based networks.
- A system of indicators is defined for evaluating dynamic routing algorithms in SDN-based networks.
- A system of indicators is defined for evaluating SDN controllers.

Contributions of an applied nature:

- An SDN controller is developed for investigating static and dynamic routing algorithms.

I acknowledge the above contributions as merits of the PhD candidate, achieved during the dissertation research.

I consider the personal involvement in the dissertation contributions to be indisputable. The PhD candidate presents **5 publications** on the topic of the dissertation, **4 of which are referenced in the international database “Scopus”**. The Scopus-indexed publications have reported **citations (27 in total)**, which is an additional indicator of the relevance and recognizability of the results. I believe that the volume and quality of the presented publications meet the requirements of the Academic Staff Development Act in the Republic of Bulgaria for the award of the educational and scientific degree “Doctor”.

3. Opinion, Recommendations, and Remarks

I have no critical remarks regarding the PhD candidate.

4. Conclusion

I consider that the dissertation meets the requirements of the Academic Staff Development Act in the Republic of Bulgaria and its implementing regulations.

In this regard, I propose to the respected scientific jury to award Eng. Dimitar Nikolov Todorov the educational and scientific degree “Doctor” in the PhD program “**System Programming**” within professional field 5.3 “**Communication and Computer Technology**”.

Date: 12.01.2026

Jury member:
/ Assoc. Prof. Dr. Eng. Diyan Zhelev Dinev/