

Review of a Doctoral Thesis at FIT BUT

Doctoral thesis (title of the thesis):

Network service diagnostics based on packet analysis

Name of the doctoral student (name and surname):

Ing. Martin Holkovič

Name and institution of the reviewer (full name of the reviewer, full name and country of the institution):

Dr. Boning Feng, Oslo Metropolitan University, Norway

I. Doctoral Thesis

Appropriateness and Relevance

Is the area addressed by the thesis appropriate to the particular scientific discipline of the doctoral thesis and does the thesis address relevant problems within the chosen area?

The thesis addresses some relevant problems within the field of network diagnosis using measurements. This problem area has attracted lots of interest, from different aspects (e.g. performance, dependability, and security).

With the increased traffic volume, the diversity and complexity of the networks, the analysis of network traffic is becoming more challenging. The candidate has done a comprehensive study of the network diagnostic and made some original contributions to the subject field.

The candidate chose to focus on methods specific to analysing the network packets, which might be a necessary limitation to make the problems manageable.

A summary of the Contributions of the Thesis

From your point of view, please summarize what the goal of the thesis is, what the main contributions of the thesis are, and whether the thesis has achieved the chosen goal.

As already mentioned above, the goal of the thesis is to find methods in network diagnostics by analysing packets. Due to the diverse nature of the networks and the large number of applications and error types, different methods should be deployed, depending on theory applied, complexity, and outcomes. After a good survey of the current state-of-the-art research areas and diagnostic methods, the candidate focuses on six methods in which the candidate gives original contributions. All these findings have been published in peer-reviewed conferences and journals.

In my opinion, the thesis has achieved the chosen goal.

Please indicate also specific contributions of the doctoral student.

The candidate is the main contributor in almost all the papers included in the thesis, which is a clear indication of the doctoral student's contribution.

Novelty and Significance:

Review of a Doctoral Thesis at FIT BUT

Please assess the level of novelty of the results and their significance for the given scientific area, for its further development, and if applicable for possible applications in practice.

The results represent the state-of-the-art of the network diagnostics. Although some of the ideas of the applied methods have been previously proposed by others, the candidate manages to implement these methods to practical example, with own improvements and original solutions. The results are highly applicable to today's networks.

The papers on rule-based approach have been implemented in real-world scenarios, which was integrated into a business product (Flowmon Packet Investigator), showing the usefulness of the method.

Evaluation of the Formal Aspects of the Thesis:

Please evaluate formal qualities of the doctoral thesis and its language level.

The formal quality of the doctoral thesis is high. The text is easy to read and understand, with few grammatical errors. The language is good, with good figures and tables.

Quality of Publications

Has the core of the thesis been published at an appropriate level? Please judge the quantity and quality of the publications. When judging the quality, please take into account internationally recognized standards (WoS/Scopus quartiles, CORE ranks, specific knowledge of flagship publication channels of a given community, etc.) in a way appropriate for the given area of the thesis.

The quantity of the publication is good.

When the quality is concerned, most of the papers contribute to new methods, algorithms, implementations of prototypes or real-world examples, making the publications rather practical oriented. The possibility to exchange ideas, methods and results with other researchers working in the similar fields without much delay is important, especially important for a doctoral student. It is therefore natural to publish these papers in peer-reviewed international conferences rather than publishing in the highest ranked journals.

II. Candidate's Overall Achievements

Overall R&D Activities Evaluation:

Does the student's doctoral thesis, the results included into it, and possible other scientific achievements listed in the list of scientific activities indicate that he/she is a person with scientific erudition and creative abilities?

Absolutely yes in my opinion.

Assessment of Other Candidate Characteristics (optional):

More characteristics of the doctoral student may be added here in a separate paragraph (e.g., awards, grant participation, international collaboration, etc.).

The national and international projects the candidate has participated indicates the importance and usefulness of the research area.

Review of a Doctoral Thesis at FIT BUT

III. Conclusion

*The conclusion should contain an explicit statement saying whether, in your opinion, the doctoral thesis and the student's achievements until now meet the generally accepted requirements for the award of an academic degree (in accordance with Section 47 of Act No. 111/1998 Coll., on higher education institution).**

In my opinion, the doctoral thesis by Ing. Martin Holkovič and the his achievements until now meet the generally accepted requirements for the award of a doctoral degree, in accordance with Section 47 of Act No. 111/1998 Coll., on higher education institution.

* Short overview of both the Act and corresponding internal BUT regulations is enclosed.

Place:

Oslo, 15.04.2024

Signature of the reviewer:

Boning Feng