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**Reviewer's opinion
on Ph.D. dissertation authored by
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entitled:**

Optimization of Energy Efficiency in Fog Computing with Latency Constraints

1. Problem and its impact

The problem discussed in the dissertation embraces the important research topic, fog computing. Fog computing, or "edge computing," is considered one of the key technologies for next-generation IoT and mobile communications systems. With the explosive development of AI, edge intelligence will become a must in developing future 6G mobile communications systems to provide timely responses to emerging applications on mobile and IoT devices. The research results in the dissertation have laid a solid foundation to facilitate the development of innovative AIoT (AI-enabled IoT) applications.

2. Contribution

The author presents his research on energy consumption minimization in fog computing networks that distribute communication and computation services along the cloud-to-end-devices continuum. To meet the low-latency requirement of AI/GenAI applications, the author also considers task execution latency constraints. The dissertation conducts a comprehensive survey of related works. It addresses a critical research challenge of finding optimal solutions for computational task offloading in fog networks, minimizing energy consumption while maintaining required latency levels. The following summarizes the contributions of the dissertation.

1. The author develops analytical models for evaluating latency and energy consumption for the real-world fog-computing network. The analysis provides insightful results to be the concrete basis for the following works in the dissertation.
2. The author formulates an elegant optimization problem for offloading task assignments and proposes novel solutions to tackle the problem.
3. The effectiveness of the solutions is evaluated and confirmed with various network scenarios and parameter settings.
4. The key findings are useful guidelines for developing future fog/edge computing networks for emerging AIoT applications in 6G.

The publications related to the research are of high quality and found in prestigious venues.

3. Correctness

The published papers undergo a rigorous review process. We have checked all the materials and did not find obvious flaws in the dissertation.

4. Knowledge of the candidate

Fog/edge computing has gained significant attention from academia and industry. Chapter 2 (Energy Consumption and Efficiency in Fog Computing Networks – State-of-the-art) provides a good tutorial of general knowledge aligned with the technology development for next-generation mobile telecommunication networks. The references are up-to-date and complete.

5. Other remarks¹

None

6. Conclusion

Taking into account what I have presented above and the requirements imposed by Article 13 of the *Act of 14 March 2003 of the Polish Parliament on the Academic Degrees and the Academic Title* (with amendments)², my evaluation of the dissertation according to the three basic criteria is the following:

A. Does the dissertation present an original solution to a scientific problem? (the selected option is marked with X)

<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Definitely YES	Rather yes	Hard to say	Rather no	Definitely NO

B. After reading the dissertation, would you agree that the candidate has general theoretical knowledge and understanding of the discipline of **Information and Communication Technology**, and particularly the area of?

<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Definitely YES	Rather yes	Hard to say	Rather no	Definitely NO

C. Does the dissertation support the claim that the candidate is able to conduct scientific work?

<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Definitely YES	Rather yes	Hard to say	Rather no	Definitely NO


Signature

¹ Optional

² http://www.nauka.gov.pl/g2/oryginal/2013_05/b26ba540a5785d48bee41aec63403b2c.pdf