



Supervisor's opinion on the Dissertation Thesis

Author: **M.Sc. Ayca Kirimtat**
Title: **Multi-objective Optimization for Smart City Concepts: Smart Floating Cities (SFC)**

Supervisor: prof. Ing. Ondřej Krejcar, Ph.D., FIM UHK

Evaluation

In the dissertation thesis, the doctoral student deals with the issue of multi-objective optimization, as part of Applied Informatics topics, which is applied in this case under Smart City umbrella, more precisely to Smart Floating Cities (SFC). Both areas were developed further during her doctoral study and published in IF journals as deep reviews in case of Smart Cities and SFC, and as original article in case of multi-objective optimization.

In her previous studies and research activities, the doctoral student has focused mainly on the issues of multi-objective optimisation, new area of Smart City, and current trends in these overlapping areas.

After finalization of issues based on knowledge discovering and a deep study of available literature, the doctoral student began to design and partially implement his solution as a framework, which would allow her to verify some hypotheses and especially be able to adjust the specific needs of new Smart concepts (finally the SFC) according given rules.

The results of the doctoral student summarized in the proposal benefit mainly from the knowledge gained during the solution of student projects (SPEV – “Smart Solutions for Ubiquitous Computing Environments” during years 2018 - 2021), IT4Neuro project 2019-2022, projects of Excellence FIM “Smart Solutions for Ubiquitous Computing Environments” 2018-2021 and communication with the scientific community at

conferences, which provided her with sufficient feedback for further development and direction of her work.

The results achieved of the doctoral student in dissertation topic were presented at several international conferences and published in recognized proceedings (Springer - LNCS; IEEE), with the publication of two IF JCR Q1 articles on the core topic of the dissertation thesis (IEEE Access and Building and Environment). In total she published 6 IF JCR journal articles (3x Q1, 3x Q2) with the best IF 14,982 and 6,456, and 13 Springer and IEEE conference papers. Her publication background also prove international cooperation with authors from Turkey, Malaysia, Netherlands, Singapore, China, Hungary, Qatar, Saudi Arabia and Spain. Her h-index is 6, while she got 216 citations until now with one highly cited article with 124 citations by ISI WOK.

These publications and papers were the basis for the preparation of the dissertation thesis for the defence. It should be noted that from a formal and stylistic point of view, the work appears to be a nice work, which is readable and demonstrates the author's ability to work with text. It is obvious that the doctoral student is very capable in working with text and in designing software solutions in abstract level and also in the lower SW level in case of optimization algorithms. In the final doctoral thesis, the consequences of the multi-objective optimization problems through the Pareto front graphs of different algorithms are associated and discoursed. Also, the computation tasks within the whole doctoral thesis are achieved by integrating the smart city and floating city applications.

In summary, it can be stated that the dissertation thesis meets the formal requirements of a text of this type. As a supervisor, I can also state that the doctoral student worked to a large extent actively and independently. **I recommend doctoral dissertation for defence and after successful defence to issue a Ph.D. title to Ayca Kirimtat.**

Hradec Králové 26.08.2021

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