



Supervisor's opinion on the Dissertation Thesis

Author: **M.Ca. Jean Sebastien Mambou**
Title: **Classification Framework for Anomaly Detection in Medical Images**

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Evaluation

In the doctoral dissertation thesis, the student deals with the automation of the process of detection of artefacts in medical images. Goal was to design a framework for classification of such anomalies from medical images. Topics lay in the area of Computer Science and Biomedical Engineering. Both areas were well developed further during his doctoral study, while he published several articles as well as conference papers in these topics at relevant computer science and engineering journals and conference series (Springer LNCS).

In his previous research activities, the doctoral student has focused mainly on the issues of video and image processing, gesture detection, infrared images processing, breast cancer diagnostics and other applied areas of image analysis using neural networks, where he present not only theoretical contributions but also real evaluations, simulations and real performances overcoming in some cases currently used techniques.

After finalization of issues based on video segmentation, image processing, machine learning, neural networks and deep learning, the doctoral student began to design and partially implement his solution as a framework, which would allow him to verify other hypotheses and especially be able to adjust the specific needs of anomaly detection based on the physician's needs, as he is appointed of IT4Neuro project in cooperation of faculty hospital of Hradec Kralove.

The results of the doctoral student summarized in the thesis benefit mainly from the knowledge gained during the solution of student projects (SPEV),

IT4Neuro(degeneration) project, projects of Excellence FIM and communication with the scientific community at conferences and online during COVID era, which provided him with sufficient feedback for further development and direction of his work.

The results achieved of the doctoral student in dissertation topic were presented at several international conferences and published four papers in recognized proceedings (Springer - LNCS), with the publication of one IF JCR Q1 article on the core topic of planned dissertation (Sensors) and one other IF journal article with close topic (gesture detection using Neural Networks). It total he published 2 IF JCR journal articles in Q1/Q2 according IF, one ESCI journal article and 9 Springer LNCS and SCI conference papers. All these publications are already indexed in SCOPUS database (4x 2018, 6x 2019 and 2x 2020). His publication background also prove strong international cooperation with authors from Malaysia at UTM. His h-index is 3 (4 according SCOPUS), while he got 66 citations until now by ISI WOK and 95 at SCOPUS. His publications are highly cited as average citation count per item is 9,43 according ISI WOK.

It ned to be mentioned that majority of citations coming for the journal paper where core of dissertation topic is published as “S.J. Mambou et al., Breast cancer detection using infrared thermal imaging and a deep learning model (2018) Sensors (Switzerland), 18 (9), art. no. 2799” Cited 63 times at SCOPUS.

These publications were the basis for the preparation of the dissertation thesis for the defence of Ph.D. It should be noted, that from a formal and stylistic point of view, the presented thesis appears to be a nice work, which is readable while it demonstrates the author's ability to work with research and scientific text. It is obvious that the doctoral student is very capable in working with text and in designing software solutions in abstract level and in the SW level in case of designing neural networks, image processing, image preparation and using existing algorithms.

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 Jean Sebastien Mambou.**

Hradec Králové 10.12.2021

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