



Confidential

Supervisor's Review of USB RIFCH PhD Thesis

Surname of the PhD student: Dinara Bekkozhayeva	Name of supervisor: Jan Urban
Title of PhD thesis: Fish biometric using machine vision	

OVERALL COMMENTARY ON THE PhD THESIS

Dinara Bekkozhayeva started in our laboratory with background in fishery and morphological analysis, however, she had a very minor previous experiences with the automatization, algorithmization, and digital image processing. Therefore, to jump into the methods and approaches of artificial intelligence was a challenge itself and Dinara passed the test.

Within a first year, Dinara dived deep into the interdisciplinary problematics, both practical and theoretical issues. She did very soon and very well understand the problems with the invasive data acquisition, with the standardization of measurements, with the complexity of data representation, and moreover the logical encapsulation of the processing and analysis pipeline.

In particular after it become clear, that obtaining rigid, solid, and valuable data is even today, another challenge, which Dinara did not underestimated, in comparison to many others. The effort and enthusiasm given by her into the work were contagious and always increased the mood in the laboratory. In that way arose an everyday dialogue between understanding the mathematical basis of biometric, developing the new approach of fish identification and data capture.

The thesis itself demonstrates just a portion of the study and research carried out by Dinara. It is also not telling the story of the painful gradual development, struggling with the obstacles, dead ends, and inevitably failures. What it is telling, is a success. I appreciate the usage of the classical methods of the artificial intelligence, where neural networks are not necessary. Not only she understand the current state of the art in biometric and fish biometric especially, she contributed in development of new noninvasive method, supported with strong results and relevant publications. The thesis itself is an original work with new ideas and discoveries, written in a style which is easy to read and follow, with logical reasoning, justification, and proved level of problematic understanding. From my knowledge, she made a significant progress and impact in the field.

FINAL RECOMMENDATION

- ☒ can be recommended for defence of PhD Thesis
☐ can be recommended with reservations for defence of PhD Thesis
☐ can not be recommended for defence of PhD Thesis

.....19.7.2022.....
Date and place

.....Urban.....
surname and signature