

Supervisor's recommendation

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Title: **Theoretical and Experimental Determination of the Amount of Information in Human Ocular Biometric Characteristics**

Supervisor: **Prof. Ing., Dipl.-Ing. Martin Drahanický, Ph.D.**

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We know each other with Lukáš since 2013, when he started solving the MSc. thesis entitled "*Generation of Cryptographic Key from Eye Biometric Features*" and successfully defended this in 2014. Since 2014 he has become a full member of the STRaDe research group at FIT BUT as a Ph.D. student.

Lukáš chose a topic that no one has yet explored in detail. Therefore, he was faced with quite pioneering research. In the course of solving the work, it was found that it will also be necessary to examine in detail the diseases that have their manifestations on the retina. These damages (could be especially observed in retinal images) then had to be taken into account both in detection applications and in statistical analysis. Therefore, for the solution, it was necessary to study many medical articles and meet several ophthalmologists regularly.

Lukáš handled his topic very thoroughly and honestly. The exploration of some topics raised a much larger number of new questions that needed to be dealt and some of them were out of the scope of his research (especially medical ones).

Lukáš actively participated in several conferences – e.g., at military fairs in Brno and London or at security conferences in Žilina and Berlin. He has published several articles in journals, and is also a co-author of extensive chapters in two foreign books – *Handbook of Vascular Biometrics* (in collaboration with Prof. Andreas Uhl, Prof. Christoph Busch, Prof. Sébastien Marcel and Prof. Raymond Veldhuis) and *Applications of Pattern Recognition* (Dr. Carlos Travieso-Gonzalez). In 2022, he was on a three-week internship at Reykjavík University in Iceland, where he presented his results in several lectures. He also briefly helped with local research there.

Last but not least, Lukáš was also very involved in other activities of the STRaDe research group and in teaching at the faculty. It was teaching that he enjoyed the most, and in 2017 he was even voted the most popular Ph.D. student at the bachelor's level. He mainly teaches the subjects *Biometric systems*, *Intelligent sensors*, *Assembler* and *Fundamentals of artificial intelligence*. He also assisted in the presentation of the research group at the IDET (*International Defence and Security Technologies Fair*) and MSV (*International Engineering Fair*) trade fairs, where he presented the results, among others, to the Prime Minister of the Czech Republic and other members of the Government of the same country. He always likes to present our biometric laboratory at the faculty to interested members of the public or foreign visitors.

I greatly appreciate the hard work, willingness to help, knowledge, reliability and extremely pleasant dealings with people around that has always represented our

research group in an exemplary manner. That is also why Lukáš continues to be involved in teaching as a lecturer, and I hope that it will remain so in the future.

Hereby, in conclusion, I definitely recommend his work to defend and to award the Ph.D. degree.

In Brno on 2022-JUN-03