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Evaluation of supervisor of master thesis
of Bc. Dominik Šepák
Title: Finding Practical Robust Classifiers

The master thesis focuses on a neglected but important problem of machine learning called robust classification, which assumes that the distribution of samples available to create a detector (or a classifier) has different probability distribution than samples on which the detector is applied (testing samples). The thesis recognizes that cover-source mismatch, a long-standing and unresolved problem of contemporary steganography, is an incarnation of this problem and therefore it uses it for experimental evaluation.

The thesis is structured as an extended research paper / technical paper. After short motivation, it reviews prior art, describes the contribution, and finally describes the experiments and their evaluation. It is easy to orient and read. Needless to say that after working with the author on bachelor and research thesis, I can observe a dramatic improvement in the quality of scientific writing. Even the first version of master thesis was already very good.

Regarding the contribution, I would like to highlight a critical assessment of prior art, where it is shown under which conditions it cannot work and therefore it does not make sense to compare with respect to it in Experimental section. The experimental section then compares several existing approaches to robust classification and their variations, intended mainly to stabilise the training. It definitely improves the current knowledge of the problem, yet more investigation is needed.

Lastly, I highlight two things. First, while the thesis has an easy flow and everything seems to be easy and straightforward, the opposite is true. An amazing struggle with the formulation of the problem, prior art not working properly, and with unstable convergence of optimization methods is hidden behind. Second, the contribution is important for the field. It has been summarised in a research paper submitted to Eusipco 2022.

With respect to the above, I recommend the thesis for defense and award it a grade A.

Tomáš Pevný
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