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View Reviews

Paper ID 5

Paper Title A Brief Review for Compression and Transfer Learning Techniques in DeepFake Detection

Reviewer #1

Questions

1. [Summary, strengths and weaknesses]: In 2-3 sentences, describe the key ideas, experiments, and their significance, highlighting the strengths and weaknesses of the paper
The paper explores compression methods and transfer learning techniques that can be used for the reduction of computational complexity as well as training overhead in Deepfake detection. Methods such as pruning, quantisation and fine tuning are utilised. The authors provide several approaches that could be used for the reduction of computational complexity and energy consumption, showing an exhaustive study of the subject. They prove that Deepfake detection models can be simplified without displaying a decline in accuracy. However, most of those options are not explained fully, making it difficult for the reader to properly grasp their concept and the implementation.

3. [Novelty and originality]: Rate the novelty and originality of the work presented in the paper.
Some novel results on a subject well investigated

4. [Technical content and correctness]: Rate the technical contribution of the paper, its soundness and scientific rigor.
Technically solid

5. [Relevance and Timeliness]: Rate the importance of the topic addressed in the paper and its timeliness within its area of research.
Above average

6. [Quality of presentation]: Rate the paper organization, the clearness of text and figures.
Readable; could benefit from revision

7. [Bibiliography]: Rate the quality, relevance and completeness of the bibliography
Average

8. [Overall recommendation]: What is your overall recommendation for this paper?
Marginal accept

9. [Comments and Recommended Changes]: please give your general appraisal and indicate any changes that should be made to the paper if it is accepted.
While this is a brief review of the methods mentioned in the paper due to the page limit, there needs to be a more informative explanation of the different approaches used and the baseline model. Additionally, the figures contain too many elements, making them confusing. It might be a good idea to separate some of the information, such as the compression time, into different graphs. Finally, in the discussion of the results there should be some mentions of exact numbers and not only general terms like "slightly superior results" and "high accuracy".

Reviewer #2

Questions

1. [Summary, strengths and weaknesses]: In 2-3 sentences, describe the key ideas, experiments, and their significance, highlighting the strengths and weaknesses of the paper
Summary:
This paper presents a study on the impact of compression and transfer learning techniques on the performance of deepfake detection methods in edge devices. Ten methods are used for the tests: baseline (no compression or transfer learning), 3 compressions models and 6 transfer learning techniques. The experiments show that accuracy remains comparable with the baseline method when training and testing datasets are the same and, in the opposite direction, the models struggle to generalize.

Strengths:
1) The topic is very relevant since edge computing is gaining increasing importance for real world applications. Additionally, deepfake is also an important topic and the effort to make it available to smartphones is also relevant.
2) The experimental section spans several method for reduce model's size, namely by compressing or transfer learning.

Weaknesses:
3) Reproducibility is not possible. The paper is highly vague regarding the methods used for comparison. Baseline method is referred to a code page, without explaining the architecture of the basic notions regarding the method itself. The three compression methods and the 6 transfer learning techniques are only described by one sentence saying only the type of methodology. No citations are provided for any method, which hinders the reproducibility.
4) The focus of the paper should be in the generalization problem, which is the main challenge (not solved) that one can extract from the experiments.
5) The experiments are performed in Kaggle notebooks, which may be considered edge devices. However, as the authors acknowledge, smartphones are the most critical devices and those that are closer to real world applications. I suggest that the experiments be performed in smartphones (ideally in diverse devices). The quantization technique cannot be fairly compared using the current experimental setup.
6) The way the conclusion section is posed is not the correct one. I would suggest posing the conclusions in the opposite way: the performance can remain high for same dataset, but struggles to have more than random classification in cross-dataset problems (for unseen data and unseen deepfakes).
7) The final sentence of second paragraph of Introduction extrapolates the paper impact. This is not fully supported for the results.
8) Last paragraph of section II says the paper tackles the problem theoretically. This is not true. No theoretical presentation or discussion exist in the paper.
9) For all the topics above, I found the novelty of this paper very limited.

Minor issues:
10) In the beginning of section III, the paper says that it uses "two compression and six …". However, "three" compression methods are listed.
11) A thorough revision of the English language should be done.

3. [Novelty and originality]: Rate the novelty and originality of the work presented in the paper.
Some novel results on a subject well investigated

4. [Technical content and correctness]: Rate the technical contribution of the paper, its soundness and scientific rigor.
Significant flaws that may call some results into question

5. [Relevance and Timeliness]: Rate the importance of the topic addressed in the paper and its timeliness within its area of research.
Average

6. [Quality of presentation]: Rate the paper organization, the clearness of text and figures.
Readable; could benefit from revision

7. [Bibiliography]: Rate the quality, relevance and completeness of the bibliography
Below average

8. [Overall recommendation]: What is your overall recommendation for this paper?
Reject

9. [Comments and Recommended Changes]: please give your general appraisal and indicate any changes that should be made to the paper if it is accepted.
Please read several suggestions on the Weaknesses section.

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