**View Reviews**

**Paper** ID1570

**Paper Title** DeepFacePencil: Creating Face Images from Freehand Sketches

**Track Name** Main Track

**Review Summary**

* Three reviewers.
* Score [1~6] and confidence
  + Borderline (4), less confident
  + Oral (6), less confident
  + Borderline (4), less confident

**Reviewer #1**

Questions

**1. [Paper Summary] What is the paper about? Please, be concise (3 to 5 sentences).**

This paper presents a neural networks based solution for generating photo-realistic facial images from pencil sketches made not just by trained artists, but by untrained people as well.

**2. [Relevance] Is this paper relevant to an audience to ACM Multimedia? Please check https://2020.acmmm.org/call-for-paper.html.**

Relevant to researchers in subareas only

**3. [Significance] Are the results significant?**

Moderately significant

**4. [Novelty] Are the problems or approaches or applications/systems novel?**

Somewhat novel or somewhat incremental

**5. [Evaluation] Is the idea proposed in this paper well supported by theoretical analysis or experimental results?**

Somewhat weak

**6. [Paper Strengths] Please discuss. Justifying your comments with the appropriate level of details about the strengths of the paper (i.e. novelty, theoretical approach and/or technical correctness, adequate evaluation, clarity, applications, etc.). For instance, a theoretical paper may need no experiments, while a paper with a new approach or application may require comparisons to existing methods.**

The paper describes in greater detail, than some others that I have reviewed, the theoretical model employed for generating the facial images. Also, the experimental results are encouraging.

**7. [Paper Weaknesses] Please discuss. Justifying your comments with the appropriate level of details about the weaknesses of the paper (i.e. lack of novelty – given references to prior work, lack of novelty, technical errors, or/and insufficient evaluation, etc.). Note: If you think there is an error in the paper, please explain why it is an error. It is not appropriate to ask for comparisons with unpublished papers and papers published after the ACM Multimedia deadline. In all cases, please be polite and constructive.**

The experimental results section could do with more details.

For example, the paper states that an expert was asked to draw some sketches and then goes on to show results in Figure 6. I did not find sufficient information about **how many** sketches the expert drew, and whether the results shown in Figure 6 are representative of the entire set, or only the **best results**.

Similarly, to write that "we invited **a large number** of graduate students to ..." is not precise enough. How many students participated? How many images did they draw? Once again, are the results shows representative of the entire set, or only show the ones that are most favorable to the proposed solution?

<Need more experiment details>

**Answer**: <List more details><The results shown in Figure 6/7/8 are selected results>

陈述：总体概括一下几个方法的结果表现如何，挑出来的结果更能证明我们方法的有效性、更能体现我们方法的设计思想。<TODO：重新收集手绘草图，并分析结果>

**8. [Preliminary Rating] Please rate the paper according to one of the following choices.**

Borderline Accept

**9. [Rebuttal Requests] Please pose questions you want to be answered in the rebuttal. Please do NOT ask the author(s) to include any new results (e.g., experiments and theorems) in the rebuttal.**

As stated above, more details about the evaluation section would be welcome.

**10. [Confidence]**

Less Confident

**Reviewer #2**

Questions

**1. [Paper Summary] What is the paper about? Please, be concise (3 to 5 sentences).**

The manuscript proposes a GAN-based architecture to generate photo-realistic human face images from hand-drawn sketches. To increase to robustness of the method, the authors use two generators in order to take also into account deformed versions of the input sketches. A spatial attention module is exploited to vary the tolerance regions. The losses are well-defined for the proposed task.

**2. [Relevance] Is this paper relevant to an audience to ACM Multimedia? Please check https://2020.acmmm.org/call-for-paper.html.**

Likely to be of interest to a large proportion of the community

**3. [Significance] Are the results significant?**

Significant

**4. [Novelty] Are the problems or approaches or applications/systems novel?**

Novel

**5. [Evaluation] Is the idea proposed in this paper well supported by theoretical analysis or experimental results?**

Sufficient

**6. [Paper Strengths] Please discuss. Justifying your comments with the appropriate level of details about the strengths of the paper (i.e. novelty, theoretical approach and/or technical correctness, adequate evaluation, clarity, applications, etc.). For instance, a theoretical paper may need no experiments, while a paper with a new approach or application may require comparisons to existing methods.**

The paper is well-written. It flows smoothly and the idea is easily digested. The architecture appears quite robust and the notations are well-defined. The proposed figures allow the reader to easily understand the proposed concepts. Finally, the task is quite challenging and the authors addressed most of the problems which can be encountered when solving such kind of problems.

**7. [Paper Weaknesses] Please discuss. Justifying your comments with the appropriate level of details about the weaknesses of the paper (i.e. lack of novelty – given references to prior work, lack of novelty, technical errors, or/and insufficient evaluation, etc.). Note: If you think there is an error in the paper, please explain why it is an error. It is not appropriate to ask for comparisons with unpublished papers and papers published after the ACM Multimedia deadline. In all cases, please be polite and constructive.**

When it comes to consider sketches drawn by common users without drawing expertise, the results do not appear quite photo-realistic. In such cases, the method shows its main limitations. However, the comparison to other approaches demonstrates that the results are acceptable for this challenging task.

<This is not a question to be answered>

**8. [Preliminary Rating] Please rate the paper according to one of the following choices.**

Oral

**9. [Rebuttal Requests] Please pose questions you want to be answered in the rebuttal. Please do NOT ask the author(s) to include any new results (e.g., experiments and theorems) in the rebuttal.**

Minor comments:

- Fig 2 : The corresponding caption incorrectly reports the name of the auxiliary generator in the last sentence. "The dual generators G\_m and G\_m .." should be "The dual generators G\_a and G\_m .."

- Eq. 8 is too long to be contained in one column. The authors should break down the equation into two parts.

- Line 568: "...while the decoder consist ..." should be "..while the decoder consists .."

- Fig. 4: I do not think it is necessary to specify in the corresponding caption that more challenging experiments are reported in the next figures.

<Typos and minor errors>

先强烈感谢这个reviewer，我们一定会按照comments修改。

**10. [Confidence]**

Less Confident

**Reviewer #3**

Questions

**1. [Paper Summary] What is the paper about? Please, be concise (3 to 5 sentences).**

This paper designed a DNN-based solution which allows building realistic face images from hand-drawn sketches.

**2. [Relevance] Is this paper relevant to an audience to ACM Multimedia? Please check https://2020.acmmm.org/call-for-paper.html.**

Relevant to researchers in subareas only

**3. [Significance] Are the results significant?**

Moderately significant

**4. [Novelty] Are the problems or approaches or applications/systems novel?**

Somewhat novel or somewhat incremental

**5. [Evaluation] Is the idea proposed in this paper well supported by theoretical analysis or experimental results?**

Somewhat weak

**6. [Paper Strengths] Please discuss. Justifying your comments with the appropriate level of details about the strengths of the paper (i.e. novelty, theoretical approach and/or technical correctness, adequate evaluation, clarity, applications, etc.). For instance, a theoretical paper may need no experiments, while a paper with a new approach or application may require comparisons to existing methods.**

- In the offline training, it develops a robust dual generator image translation network for hand-drawn sketches

- Very useful application for detecting suspicious people

**7. [Paper Weaknesses] Please discuss. Justifying your comments with the appropriate level of details about the weaknesses of the paper (i.e. lack of novelty – given references to prior work, lack of novelty, technical errors, or/and insufficient evaluation, etc.). Note: If you think there is an error in the paper, please explain why it is an error. It is not appropriate to ask for comparisons with unpublished papers and papers published after the ACM Multimedia deadline. In all cases, please be polite and constructive.**

- Can the proposed solution generalized to other types like animals, cars, etc. how and why?

**Answer:**

**- Face images are aligned, and the structure of faces are well-defined. ->The proposed solution might be easy to be generalized to aligned images of other types, such as animal face dataset [FUNIT，Liu et al. CVPR 2019], shoes dataset[pix2pix] and handbag dataset [pix2pix], Cars [???]. However there potentially exists some challenges in generalizing to unaligned dataset or dataset with multiple object classes like ImageNet <or arbitrary view>, for the variety of structures, positions and scales +views.**

**- ~~Face image generation achieves very high-quality performance in recent works.~~**

**~~- Textures of animals are similar to those of face image in term of texture complexity. Textures of car images are less challenging.~~**

**-**

- Novelty is limited and not clear compared to existing work, in particular this paper: Chen, Shu-Yu, et al. "Deep Generation of Face Images from Sketches." arXiv preprint arXiv:2006.01047 (2020).

**Answer:** It is not able to compare with this paper, since this paper is not published and is available at arXiv in June 2020 AFTER the submit date of our paper.

- 'We argue that the balance between the realism and the conformance differs from one position to another across the face image'. this not clear, can you explain why?

**Answer:** We argue that the quality of each part of a sketch differs from each other. The balance moves forwards to the conformance at a well-drawn part to meet the desire/tendency of user, while moving forwards to the realism at a poor-drawn part to ensure the quality of the generated image.

- Eq.8 is not clear

**Answer: <To be modified>** Tq.8 is to be modified in the final version.

- The proposed solution is very expensive in term of complexity because it requires treating each facial feature locally first and then the face as a whole? can you elaborate more on this?

**Answer:** <Do not understand this question>

<TODO: Compute complexity: 1) If large, explain the reason: we need high complexity to implement the spatially vary relax/balance. 2) If not that large: the complexity is not as large as it appears since the number of channels of feature in SAP is small (45).

- "our model produces more realistic face images with more symmetric eyes and fine textures" how your solution **selects** these textures, colors, characteristic of the face?

**Answer:** These textures, colors, characteristic of the face are not contained in input sketches and generated randomly in the model.

这个思路在GAN的相关领域已经有一些人关注了，感谢您为我们的未来工作提供了一个很好的思路。

(It is interesting to explore the inside mechanism of the generation of this information)

(A series of papers on GAN understanding are trying to reveal the mechanism.)

- More datasets and comparison are needed for the evaluation.

**Answer: <It is a weakness and not a request.>** More results are to be added in the final version

例如主观实验、更多的草图、其他数据集。

**8. [Preliminary Rating] Please rate the paper according to one of the following choices.**

Borderline Accept

**9. [Rebuttal Requests] Please pose questions you want to be answered in the rebuttal. Please do NOT ask the author(s) to include any new results (e.g., experiments and theorems) in the rebuttal.**

Same as Weaknesses.

**10. [Confidence]**

Less Confident