

[ICCV 2017](#)**International Conference on Computer Vision 2017**

Oct 22, 2017 - Oct 29, 2017, Venice, Italy

Reviews For Paper**Paper ID** 612**Title** Face Sketch Synthesis with Style Transfer using Pyramid Column Feature**Masked Reviewer ID:** Assigned_Reviewer_1**Review:**

| Question | |
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| <p>Paper Summary. Please summarize in your own words what the paper is about.</p> | <p>The paper presents a face sketch synthesis approach using the recent neural style transfer techniques [4][5][7].</p> <p>The main difference and extension in this work is that, the target style is no longer computed from an arbitrary style image given by the user, but automatically estimated from the training set of photo-sketch pairs. Specifically, the input photo is divided into non-overlapping patches. Each patch finds its nearest neighbor patch in the training photos. The feature patches (middle level layers in VGG-19) on the corresponding training sketches are treated as part of the target style feature map. The full target feature maps are assembled from multiple such feature patches.</p> <p>Given the target feature maps, sketch generation/synthesis is performed by updating the content image to minimize a loss function consisting of a content loss term, a style loss term and a new heuristic key component loss term, which is essentially another style loss defined over a pre-defined rectangular region. The step is very similar to previous style transfer work.</p> <p>Results on standard face sketch datasets [14][9] show that the approach performs better than traditional methods (such as MRF based ones [14][20]) and the recent deep learning based methods [18][17][5], qualitatively and quantitatively, at preserving more details such as hair and avoiding over-smoothing artifacts.</p> |
| <p>Paper Strengths. Positive aspects of the paper. Be sure to comment on the paper's novelty, technical correctness, clarity and experimental evaluation. Notice that different papers may need different levels of evaluation: e.g., a theoretical paper vs. an application paper</p> | <p>--- Using style transfer technique to do face sketch synthesis is novel.</p> <p>--- Automatic target style estimation is reasonable.</p> <p>--- Writing is clear and good.</p> <p>--- Experiment results are good and convincing.</p> |
| <p>Paper Weaknesses. Discuss the negative aspects: lack of novelty or clarity, technical errors, insufficient experimental evaluation, etc. Please justify your comments in great detail. If you think</p> | <p>--- Technical novelty is very limited. All steps and components are used before, including the nearest neighbor based target style image patch search.</p> <p>--- Decomposing the input photo into non-overlapping patches is problematic and would cause boundary discontinuities. Although working on the feature space would somehow alleviate this problem. This artifact can be clearly observed when the input face photo is not in the training set, such as in Fig. 8.</p> <p>--- Using normalized Gram matrix difference as the performance metric is not well motivated.</p> <p>--- The difference and advantage over previous deep learning based methods [17][18] is not well explained. What's the key difference in this work? This work can avoid over-smoothing artifact. Is this because it adopts L1 loss but previous</p> |

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| the paper is not novel, explain why and provide evidences | works use L2 loss? If so, such a minor difference can't be treated as the technical contribution. --- The new key component loss term is not well motivated and justified in the experiment. |
| Preliminary Rating | Borderline |
| Preliminary Evaluation. Please indicate to the AC, your fellow reviewers, and the authors your current opinion on the paper. Please summarize the key things you would like the authors to include in their rebuttals to facilitate your decision making. | <p>Overall, the technical contribution is very limited. The main contribution of this work could be successful application of style transfer in face sketch synthesis.</p> <p>Very borderline for ICCV. I am slightly inclined to weak reject.</p> <p>There are quite a few issues, as pointed above. I would like to hear more discussions/comments in the rebuttal.</p> |
| Confidence. Write "Very Confident" to stress you are absolutely sure about your conclusions (e.g., you are an expert working in the area), "Confident" to stress you are mostly sure about your conclusions (e.g., you are not an expert but are knowledgeable). "Not Confident" in all the other cases. | Confident |

Masked Reviewer ID: Assigned_Reviewer_2

Review:

| Question | |
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| Paper Summary. Please summarize in your own words what the paper is about. | This paper proposes a new face sketch synthesis method inspired by the process of how artists draw sketches. In this method, the outline of the face is delineated by a content network and the style extracted from sketches drawn by artists are transferred to generate a final sketch. Experimental results demonstrate it has achieved the state-of-the-art performance on UHK student dataset and the AR dataset. |
| Paper Strengths. Positive aspects of the paper. Be sure to comment on the paper's novelty, technical correctness, clarity and experimental evaluation. Notice that different papers may need different levels of evaluation: e.g., a theoretical paper | The results of this paper seem good. The architecture has some novelty. |

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| vs. an application paper | |
| <p>Paper Weaknesses. Discuss the negative aspects: lack of novelty or clarity, technical errors, insufficient experimental evaluation, etc. Please justify your comments in great detail. If you think the paper is not novel, explain why and provide evidences</p> | <p>The weaknesses of this paper contain:</p> <ol style="list-style-type: none"> 1) the experiment is not complete. The authors should demonstrate how their method preserves the sketch detail using special experiments, i.e., which part of their network contributes to the sketch detail. 2) the authors did not clearly clarify the motivation of their method, how does their method preserve the sketch detail? 3) the reviewer want to see some discussions about the limitation of this method. |
| Preliminary Rating | Weak Accept |
| <p>Preliminary Evaluation. Please indicate to the AC, your fellow reviewers, and the authors your current opinion on the paper. Please summarize the key things you would like the authors to include in their rebuttals to facilitate your decision making.</p> | <p>I suggest a borderline to this paper. The experimental results compared to previous methods seem good. The biggest problem of this paper is that they should add more insightful analysis and experiments to convince the reviewer that their framework is powerful on sketch detail. Moreover, limitations of the method should be discussed. Lastly, the authors need some additional effort on the paper editing. For example, the sizes of the portraits in Figs 1, 6 and 7 are not unified (FCNN result in Fig 6 has a little bit zoom-in compared to other results).</p> |
| <p>Confidence. Write "Very Confident" to stress you are absolutely sure about your conclusions (e.g., you are an expert working in the area), "Confident" to stress you are mostly sure about your conclusions (e.g., you are not an expert but are knowledgeable). "Not Confident" in all the other cases.</p> | Confident |

Masked Reviewer ID: Assigned_Reviewer_3

Review:

| Question | |
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| <p>Paper Summary. Please summarize in your own words what the paper is about.</p> | <p>This paper studied sketch synthesis of face images by using deep neural networks. The synthesis framework was divided into two steps, generating content images and enriching details. The proposed method seems to produce better results than existing works.</p> |
| Paper Strengths. | + The authors solve an important problem in the computer vision community. |

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| Positive aspects of the paper. Be sure to comment on the paper's novelty, technical correctness, clarity and experimental evaluation. Notice that different papers may need different levels of evaluation: e.g., a theoretical paper vs. an application paper | <p>+ The combination of content image and detailed textures and shadings are straight forward, but sounds reasonably.</p> <p>+ Both quantitative and qualitative experiments show the improvements over previous works. The proposed method was also evaluated on real world photos.</p> |
| Paper Weaknesses. Discuss the negative aspects: lack of novelty or clarity, technical errors, insufficient experimental evaluation, etc. Please justify your comments in great detail. If you think the paper is not novel, explain why and provide evidences | The main weakness is missing details in the experiment. I would like to know more about complexities of computation and memory of the proposed approach. Moreover, the method should be evaluated quantitatively in real world data. |
| Preliminary Rating | Borderline |
| Preliminary Evaluation. Please indicate to the AC, your fellow reviewers, and the authors your current opinion on the paper. Please summarize the key things you would like the authors to include in their rebuttals to facilitate your decision making. | <p>See above.</p> <p>Is the method based on face alignment to detect the facial patches? Is the proposed approach robust when the results of face alignment are not accurate?</p> |
| Confidence. Write "Very Confident" to stress you are absolutely sure about your conclusions (e.g., you are an expert working in the area), "Confident" to stress you are mostly sure about your conclusions (e.g., you are not an expert but are knowledgeable). "Not Confident" in all the other cases. | Confident |

