

#5: 3.2

#11: 3.6

#32: 3.7

#40 (must be Kun Zhou): 4.0, haha yes!

#61: 3.2

Dear Reviewers,

Thank you for the valuable feedback and for appreciating the quality of our results. We will first address the common issues raised by multiple reviewers and then discuss the individual questions.

Q: Discuss about failure cases and limitations (#32 #61)

A: Face modeling can fail when landmarks are not properly detected or when hair segmentation fails. This can happen during severe occlusions, extreme lighting conditions, and particularly non-frontal head poses. The accuracy of our hair classification network is not 100% (e.g., invisible ponytails can be ambiguous from time to time). Similar to previous papers, our method would fail to retrieve the correct hair model when the input hairstyle is too different from the ones in the database (e.g., braids). We will provide multiple failure examples in the revision.

Q: Show actual real-time animation using strips (#11 #61)

A: Since our animation is done in Unity, we can easily incorporate real-time simulations for the hair strips. We will add hair simulation examples in the revision.

#5

Q: The results of hairstrips are not impressive, especially for short hairstyles.

A: Not all the hairstyles in our database are modeled with the same quality level during this submission. We continuously update the hair models and are happy to provide better ones for the final version.

#11

Q: Why the quality is so improved comparing with previous submission.

A: For the hair, our previous submission only used a primitive hair texture rendering based on Blinn-Phong shading and transparency ordering was not implemented. In this submission, hair shading has been significantly improved using a variant of Sadeghi 2010 (used in Disney's Tangled) and a correct implementation of transparency sorting based on depth peeling. For the face, our contour landmark constraints had a bug in the previous submission, which is fixed in this submission.

#32

Q: Is it possible to share code for other researchers' comparisons.

A: We will make our digitization software available on a website for public use.

Q: The results are nice, but deep in the uncanny valley

A: For photoreal results, more advanced appearance properties need to be estimated and used with a more sophisticated real-time rendering engine. Since this is beyond the scope of our work, we would be happy to discuss this in the future work section.

#40

Q: Tone down the claim "superior to cutting edge avatar modeling systems that are based on multiple input photographs".

A: We will tone down our claim and mention that our results are comparable to cutting edge avatar modeling systems.

Q: Tone down the claim "for the first time an end-to-end framework that integrates both components".

A: We will be more precise and add "automatic" in the revision.

Q: Mention the demo from FaceUnity to prove the common interest in photo-to-avatar from industry.

A: This is an excellent reference and we are happy to mention FaceUnity in the revision.

#61

Q: [Chai et al. 2014] seems to produce similar results and both have their pros and cons.

A: We can demonstrate results with very short and shaved hairstyle, which is a limitation mentioned in [Chai et al. 2014]

Q: Show that indeed the avatars are comparable to the ones that are created by professional artists for games.

A: We will show an example input image of a cutting edge game character (e.g. Uncharted 4) and reconstruct the model using our method.

Q: Why it is hard for strands to achieve real-time.

A: Hair polystrips are commonly used in computer games due to excessive computation requirements for complex multi-character scenes and other tasks. Using polystrips as the approximation, hair rendering and animation cost can be largely reduced as opposed to using strand-based representations. While real-time hair strand simulation is possible using pre-trained data as shown in [Chai et al. 2014], it has only been demonstrated for a single character.

Q: Evaluation of the hair segmentation network.

A: We are happy to provide more details and experiments about hair segmentation.

Q: Claims such as "can be done for any user, easily" should be toned down. The claims are not realistic unless there are statistics on how many users it worked and how many it didn't and why.

A: We will tone down the language in the next revision.

Q: Claims such as "strands are not good for dreadlocks type of hair styles" also not supported well in the paper. The result in Fig 13 looks similar for both papers.

A: We will provide better examples to illustrate the advantages of using polystrips to represent dreadlocks.