

# ***Supplementary Material: Intrinsic Face Image Decomposition with Human Face Priors***

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## **1 Additional results**

In Fig. 2–Fig. 14, we present additional comparisons to the current state-of-art single-image methods for face modeling [2] and intrinsic image decomposition [1]. We show results with white illumination in Fig. 2–Fig. 7 and non-white illumination in Fig. 8–Fig. 14. Note the differences in decomposed albedo maps between the Caucasian woman in Fig. 13 and the black woman in Fig. 14 under the same illumination.

## **2 Evaluation of estimated illumination chromaticity**

Since ground truth on the illumination chromaticity is not available for a quantitative evaluation, we instead show that our estimated illumination chromaticity is more consistent with the Planckian locus model. Figure 1 shows the estimated illumination chromaticity in CIE-XYZ color space with the Planckian locus path. Circles signify the estimated illumination chromaticity for white illumination (Fig. 2–Fig. 7); crosses mark the estimated illumination chromaticity for non-white illumination (Fig. 8–Fig. 14); red indicates the results of our proposed approach and blue is for the results of SIRFS [1]. In this comparison, our results are closer to Planckian locus path and qualitatively closer to the actual illumination chromaticity.

## **References**

1. Barron, J.T., Malik, J.: Shape, illumination, and reflectance from shading. Tech. Rep. UCB/EECS-2013-117, EECS, UC Berkeley (May 2013)
2. Kemelmacher-Shlizerman, I., Basri, R.: 3d face reconstruction from a single image using a single reference face shape. *Pattern Analysis and Machine Intelligence, IEEE Transactions on* 33(2), 394–405 (Feb 2011)

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\* This work was done while Chen Li was an intern at Microsoft Research Asia.

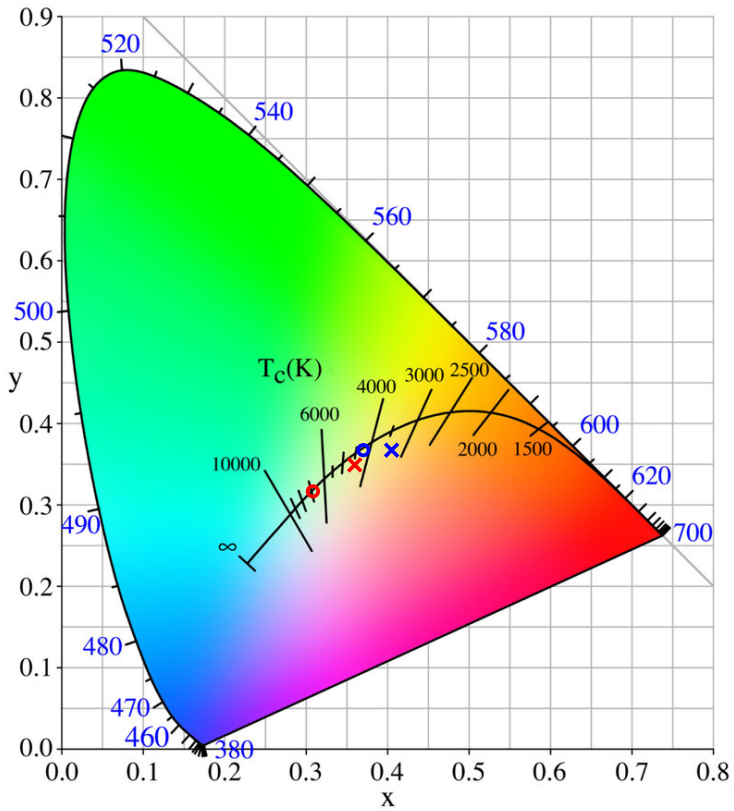


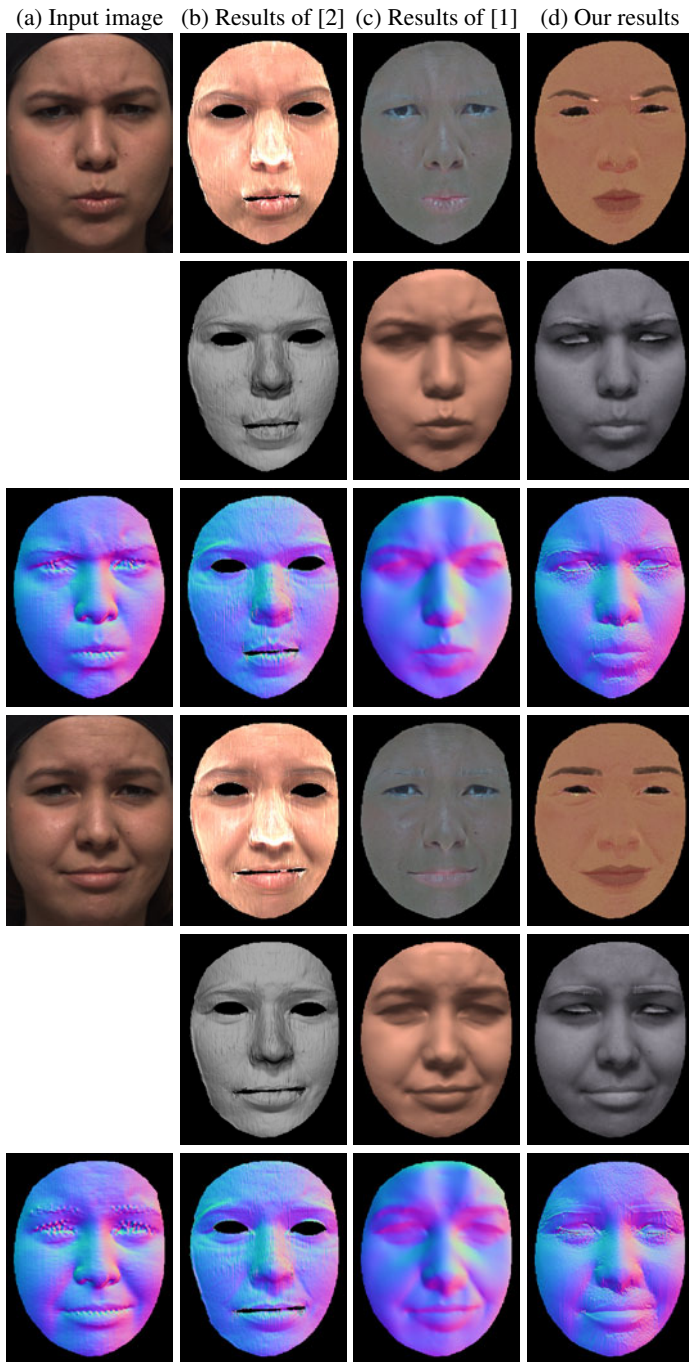
Fig. 1. Evaluation of estimated illumination chromaticity.



**Fig. 2.** Comparison of intrinsic images and 3D shapes. (a) Input images and ground-truth geometry. (b) Results of [2]. (c) Results of SIRFS [1]. (d) Our results. For each example, the first row is reflectance, the second row is shading, and the last row is a normal map.



**Fig. 3.** Comparison of intrinsic images and 3D shapes. (a) Input images and ground-truth geometry. (b) Results of [2]. (c) Results of SIRFS [1]. (d) Our results. For each example, the first row is reflectance, the second row is shading, and the last row is a normal map.



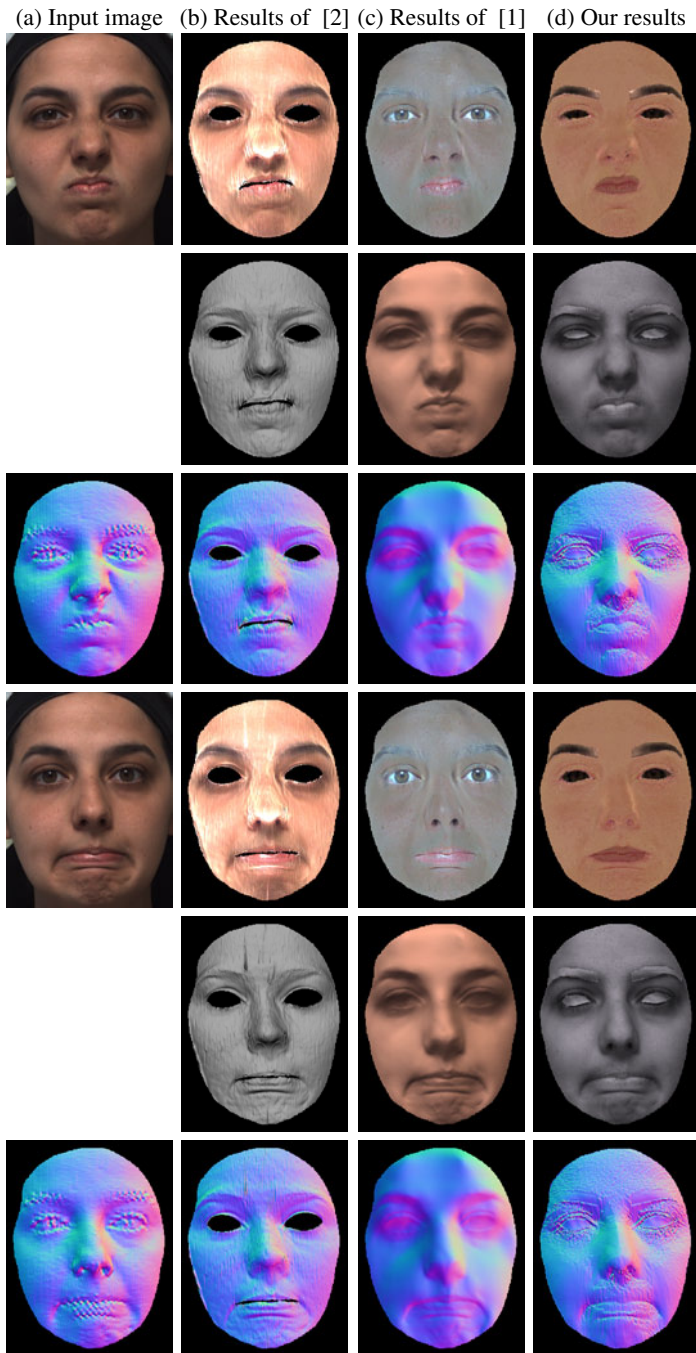
**Fig. 4.** Comparison of intrinsic images and 3D shapes. (a) Input images and ground-truth geometry. (b) Results of [2]. (c) Results of SIRFS [1]. (d) Our results. For each example, the first row is reflectance, the second row is shading, and the last row is a normal map.



**Fig. 5.** Comparison of intrinsic images and 3D shapes. (a) Input images and ground-truth geometry. (b) Results of [2]. (c) Results of SIRFS [1]. (d) Our results. For each example, the first row is reflectance, the second row is shading, and the last row is a normal map.



**Fig. 6.** Comparison of intrinsic images and 3D shapes. (a) Input images and ground-truth geometry. (b) Results of [2]. (c) Results of SIRFS [1]. (d) Our results. For each example, the first row is reflectance, the second row is shading, and the last row is a normal map.

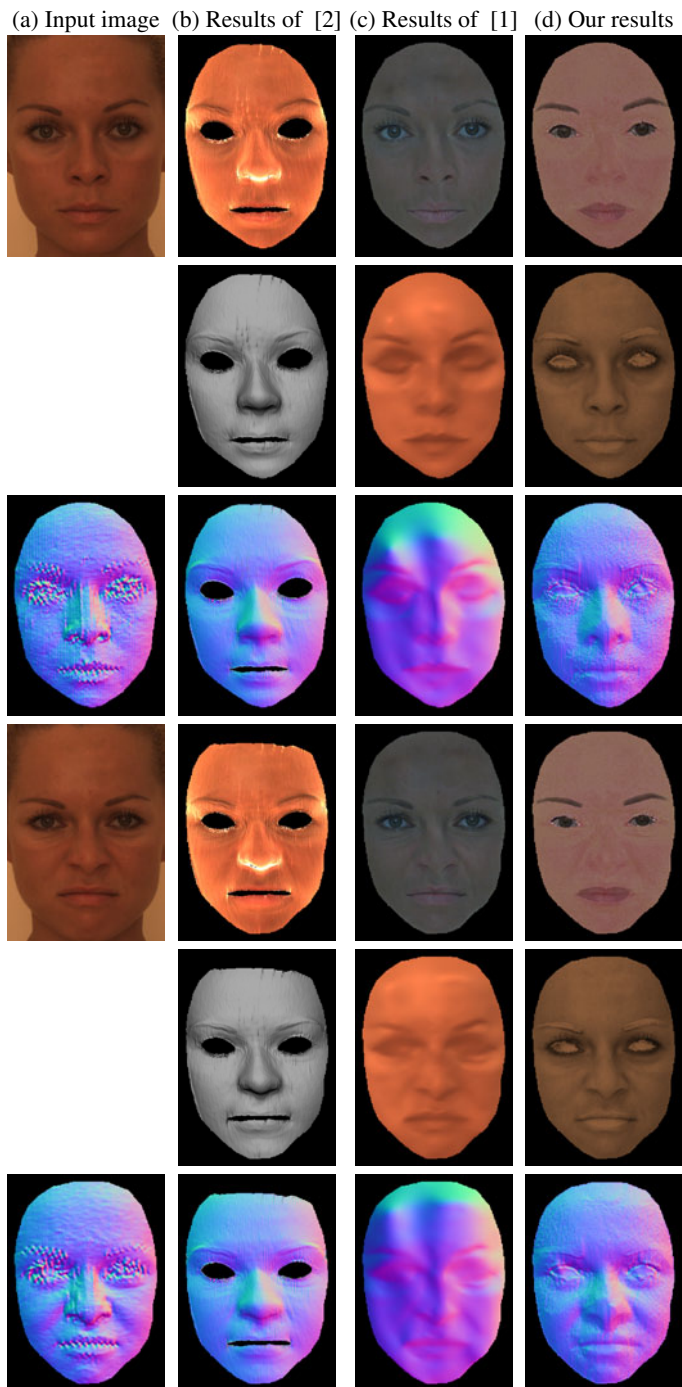


**Fig. 7.** Comparison of intrinsic images and 3D shapes. (a) Input images and ground-truth geometry. (b) Results of [2]. (c) Results of SIRFS [1]. (d) Our results. For each example, the first row is reflectance, the second row is shading, and the last row is a normal map.





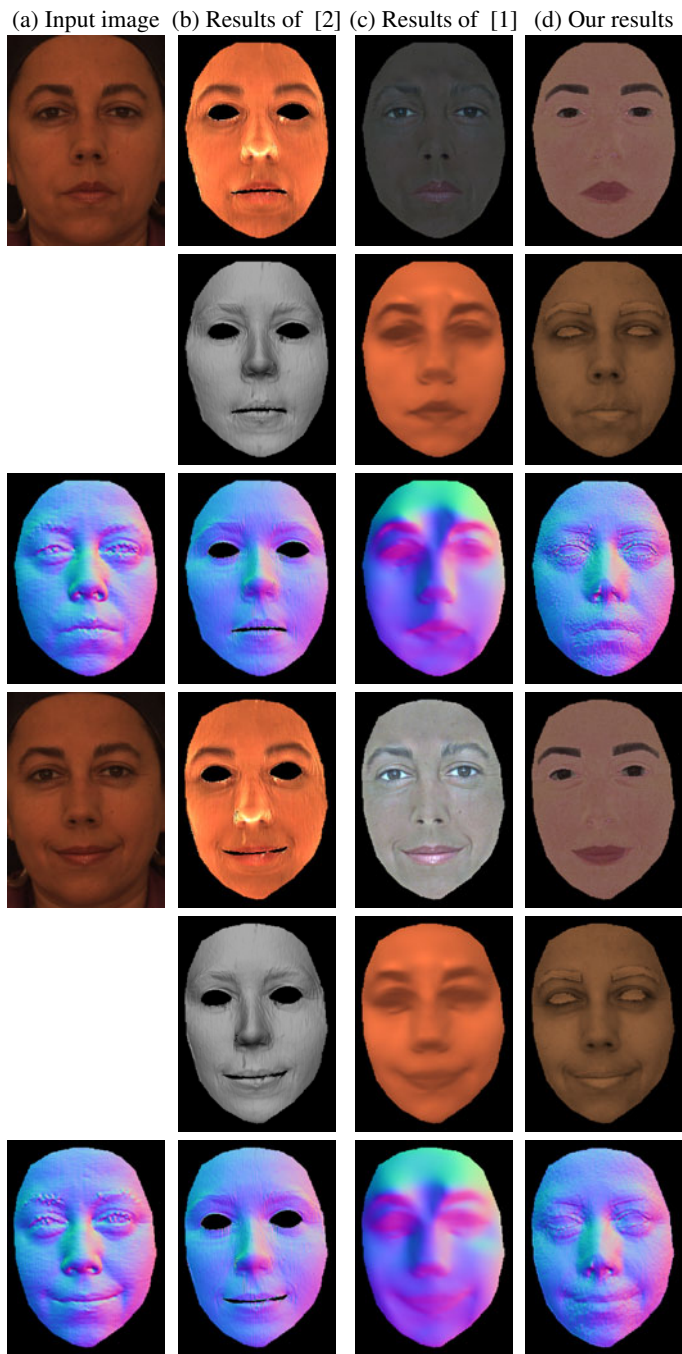
**Fig. 8.** Comparison of intrinsic images and 3D shapes. (a) Input images and ground-truth geometry. (b) Results of [2]. (c) Results of SIRFS [1]. (d) Our results. For each example, the first row is reflectance, the second row is shading, and the last row is a normal map.



**Fig. 9.** Comparison of intrinsic images and 3D shapes. (a) Input images and ground-truth geometry. (b) Results of [2]. (c) Results of SIRFS [1]. (d) Our results. For each example, the first row is reflectance, the second row is shading, and the last row is a normal map.



**Fig. 10.** Comparison of intrinsic images and 3D shapes. (a) Input images and ground-truth geometry. (b) Results of [2]. (c) Results of SIRFS [1]. (d) Our results. For each example, the first row is reflectance, the second row is shading, and the last row is a normal map.



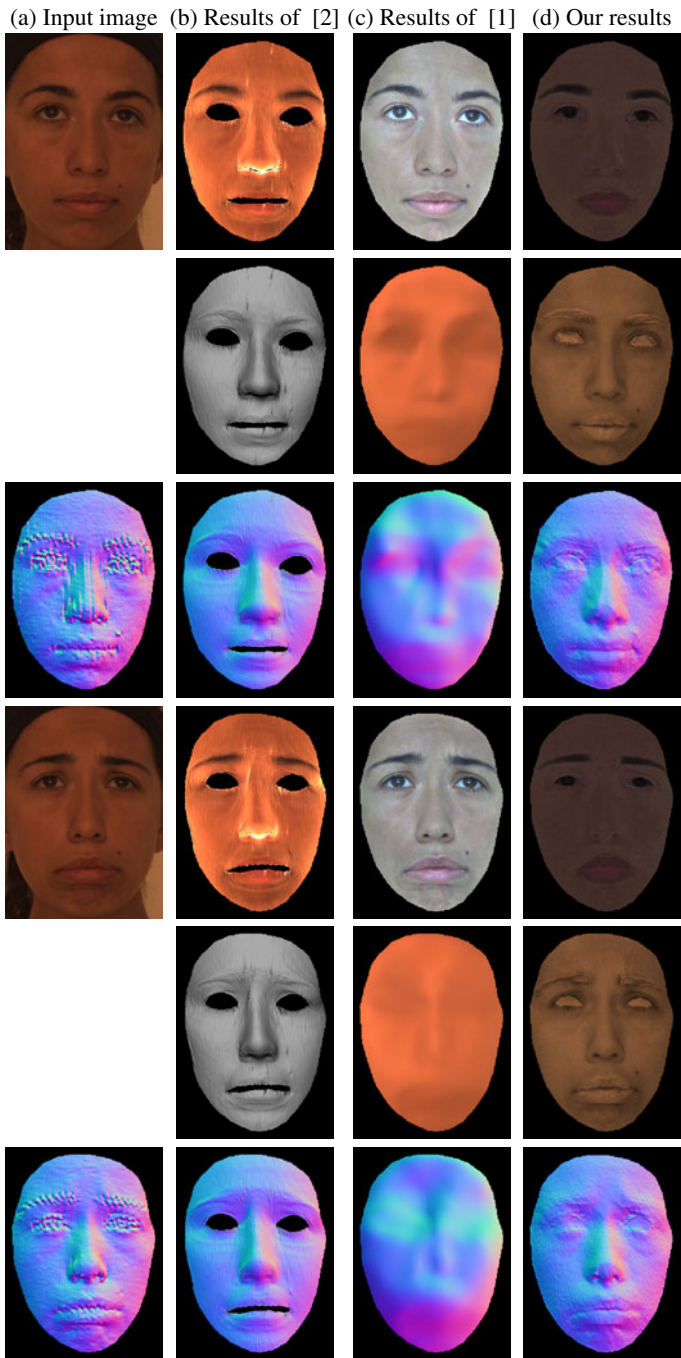
**Fig. 11.** Comparison of intrinsic images and 3D shapes. (a) Input images and ground-truth geometry. (b) Results of [2]. (c) Results of SIRFS [1]. (d) Our results. For each example, the first row is reflectance, the second row is shading, and the last row is a normal map.



**Fig. 12.** Comparison of intrinsic images and 3D shapes. (a) Input images and ground-truth geometry. (b) Results of [2]. (c) Results of SIRFS [1]. (d) Our results. For each example, the first row is reflectance, the second row is shading, and the last row is a normal map.



**Fig. 13.** Comparison of intrinsic images and 3D shapes. (a) Input images and ground-truth geometry. (b) Results of [2]. (c) Results of SIRFS [1]. (d) Our results. For each example, the first row is reflectance, the second row is shading, and the last row is a normal map.



**Fig. 14.** Comparison of intrinsic images and 3D shapes. (a) Input images and ground-truth geometry. (b) Results of [2]. (c) Results of SIRFS [1]. (d) Our results. For each example, the first row is reflectance, the second row is shading, and the last row is a normal map.