Supplemental Materials of Face Forgery Detection by 3D Decomposition

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1. Examples of 3D Decomposition

In this section, we present more examples of 3D decomposition in Figure 1, where an original face image can be decomposed to 3D geometry, ambient light, direct light, common texture, and identity texture. The proposed facial detail is the composition of direct light and identity texture, which we present in the last row.

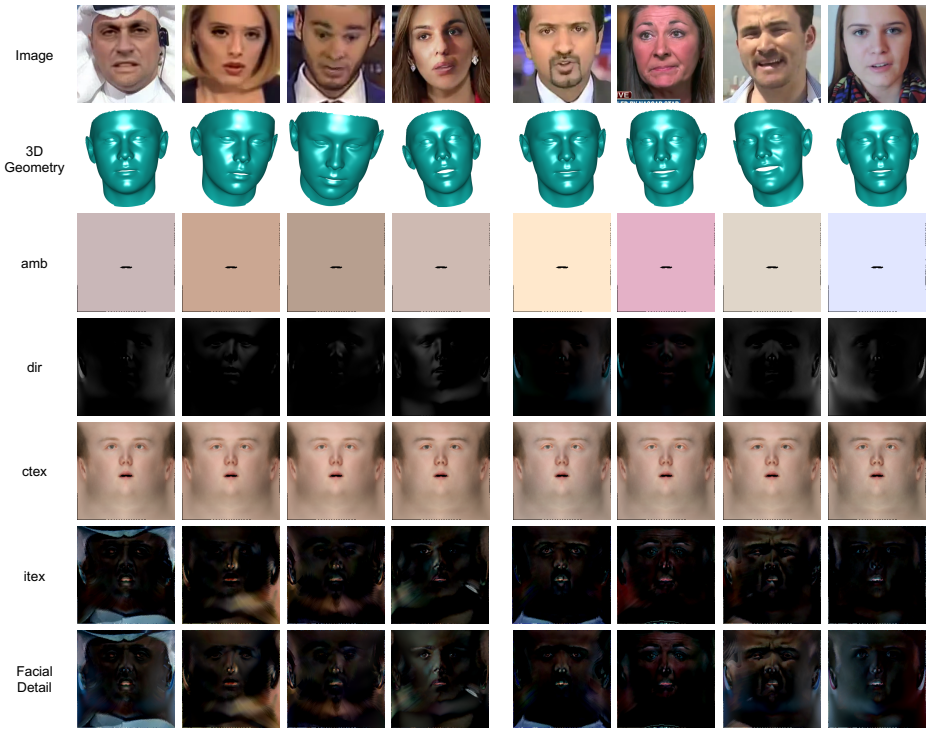

Figure 1. Examples of 3D decomposition. We decompose each face image to 3D geometry, ambient light (amb), direct light (dir), common texture (ctex) and identity texture (itex). We construct the facial detail for forgery detection. The first four columns are fake data. The last four columns are real data.

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2. Examples of Misclassification without Direct Light

In Section 3.1 of the original paper, we claim that many fake samples that In-c (3D shape + direct light + identity texture) correctly classifies but In-d (3D shape + identity texture) does not are under intense light, verifying our assumption that current manipulation methods cannot simulate direct light properly. Here we present some of the examples in Figure 2. We can see these misclassified samples share the intense direct light environment.

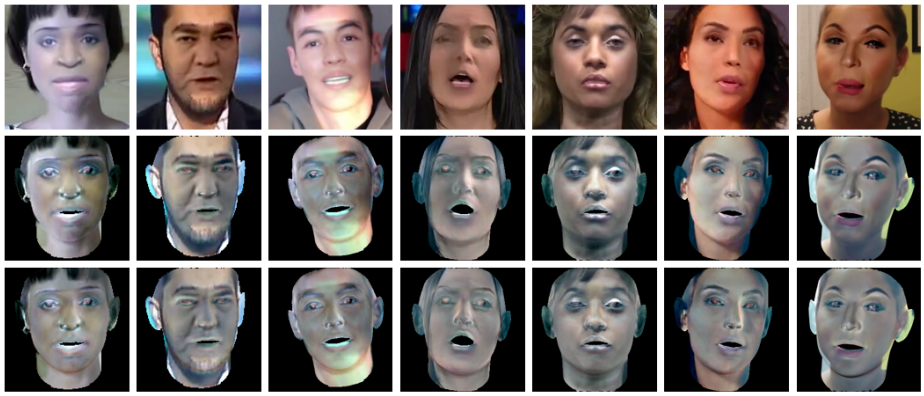

Figure 2. Samples misclassified due to the removed direct light. The first row is the face images. The second row is the corresponding direct light + identity texture, which shows good robustness in the experiments. The last row is the corresponding identity texture, which does not perform well without direct light.

3. Examples of Detail-guided Attention Map

In this section, we present some examples of the attention map learned by the facial detail difference in Figure 3. The attention maps position the plausible manipulated regions including facial features, unusual smooth region and the specularity on the forehead.

Figure 3. Examples of the detail-guided attention map. The first row is the face images. The second row is the facial details. The last row is the attention maps learned by the difference of facial detail.