Exposing GAN-generated Faces Using Inconsistent Corneal Specular Highlights
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**Problem Description**
Can you tell which are fake?

**Background**

The cornea has a spherical shape and its surface exhibits mirror-like reflection characteristics, which generates the corneal specular highlights when illuminated by light emitted or reflected in the environment at the time of capture.

**Method**

We align the extracted corneal specular highlights of the two eyes (denoted as \(R_L\) and \(R_R\)) with a translation, and use their Intersection over Union (IoU) scores, \(\frac{R_L \cap R_R}{R_L \cup R_R}\), as a similarity metric.

**Experiments**

**Experiments (Consistency Analysis)**

**Experiments (Numerical Analysis)**

**Conclusion & Future Work**

In this work, we show that GAN synthesized faces can be exposed with the inconsistent corneal specular highlights between two eyes. Our method has several limitations.

- We only compare pixel differences without considering inconsistencies in geometry and scene.
- Also, we may have false positives when the portrait setting is not obeyed, e.g., when a light source is very close to the subject or a peripheral light source that is not visible in both eyes. It does not apply to images where specular patterns are not present.

In the future, we will investigate these aspects and further improve the effectiveness of our method.


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