C13   **The Use of Photo Response Non-Uniformity (PRNU) Patterns for the Comparison of Online Videos on Social Media**

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After attending this presentation, attendees will learn that camera identification with online videos should be well validated. In several instances, the wrong conclusion may be drawn by using this method.

This presentation will impact the forensic science community by illustrating how video compression may influence PRNU patterns for camera identification.

It can be important in a forensic investigation to determine the source camera which is used in the recording of specific movies; however, it can also be important to determine how many cameras are used in the recording of movies which are posted on social media platforms such as Facebook® or YouTube®. This research focuses on the use of PRNU patterns in online videos for the determination of the number of cameras used to record the given movies. PRNU is a type of noise present in a picture and video that is caused by the different reaction of pixels to light. Subsequent pixels should have similar values, but this is not always the case due to the manufacturing of the cameras. The PRNU pattern is used for camera identification and can be useful in, for example, child pornography or movie piracy cases. It can also be important to compare multiple online videos to determine how many cameras are used in the recording of specific movies.

Different cameras were tested to determine if it is possible to separate between movies recorded with the same camera and movies recorded with a different camera. The movies were first compared before they were uploaded to YouTube® and Facebook® and the results demonstrated that it was possible to distinguish between movies recorded with the same camera and movies recorded with different cameras. The videos were uploaded to YouTube® and Facebook® and were downloaded again to perform the same comparison. The results revealed that there was a difference in the PRNU pattern which was extracted from those movies. This was probably caused by the extra compression applied by the online platforms. The comparison between the movies demonstrated different results per camera. It was possible for the videos uploaded to YouTube® to distinguish between movies created with the same camera and movies recorded with a different camera when the Canon® Powershot® SX210 IS was used; however, it was not possible in two other models tested. The Canon® camera also provided the best results for the Facebook® videos, but 6 out of the 25 movies delivered an incorrect conclusion and this error rate was even higher in the other cameras. This shows that the compression applied by the online platform has much influence on the PRNU pattern. More research should be performed to optimize the current algorithms for the use of PRNU patterns in online videos.

PRNU, Camera Identification, Social Media

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