C40   The Use of the On-Screen Time Display for Authentication of Body-Worn Video

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Learning Overview: After attending this presentation, attendees will better understand the need for the development of methods for the authentication of Body-Worn Camera (BWC) recordings and will be presented with the results from research performed in relation to such.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by providing one method of authenticating body-worn video in a matter that can be utilized in casework with immediate effect.

The proposed method takes advantage of the on-screen time display of BWC video recordings, which is superimposed onto video frames during encoding. It is based on the assumption that as this is added during the encoding stage, factors relating to the capture environment, such as lighting, time of day, camera movement, and recording length, have no influence on parameters such as the pixel values used to represent it and the resolution of both its digits and the display in its entirety. It, therefore, stands to reason that its representation should be consistent across recordings captured with a device of the same make and model. As transcoding decodes and re-encodes the visual content in a different format, it can also be inferred that this embedded trace will be changed when a conversion occurs, as would be the case when editing and uploading to social media.

The increase in the use of BWCs by law enforcement, combined with the recent trend for videos from such to be shared on both social media and by news and media outlets, has made the authentication of these recordings of more importance than ever before.

To address the above, the following hypotheses were proposed, in sequential order: (1) the on-screen time display within BWC video streams from a specific make and model of device is consistent regardless of all other factors; (2) the on-screen time display within BWC video streams changes when the video is transcoded from the original recording; therefore (3) the on-screen time display within BWC video streams can be used to determine the authenticity of a recording.

To test the proposed hypotheses, a dataset of original recordings was developed through the capture of videos in different environmental conditions, under differing light sources, and of varying lengths. Various parameters of the onscreen time display related to resolution and pixel values were then measured to allow the intra-variability (between captures from the same device) and inter-variability (between captures of differing devices) to be determined. The video data was then transcoded to new formats and comparisons made between the measurements from parameters of the original recordings and their transcoded versions was performed.

This research aims to provide a stepping stone for further developments in methods of authentication of body-worn video.

Body-Worn, Video, Authentication

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