



C12 An Acceptable Resolution for the Identification of Knives Captured Within Closed-Circuit Television (CCTV) Imagery

James Zjalic, MSc, Verden Forensics, Edgbaston, England B15 1TH, UNITED KINGDOM*

Learning Overview: After attending this presentation, attendees will better understand the reliability issues surrounding the identification of knives within CCTV imagery and will be presented with findings from research into this area.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by sharing research pertaining to the minimum acceptable resolution for the analysis of a purported knife within CCTV imagery, thus increasing reliability of said analysis.

Previous research has been conducted to define thresholds for the face in terms of facial width in resolution and pixels as well as bit-rates, and it is the recent spike in knife crimes within the United Kingdom that has driven the need for research into these measurements in relation to knives.

The increase in knife crime over the past few years within the United Kingdom has led to a substantial increase in the purported identification of knives from CCTV imagery to provide evidential support in criminal trials. As no weapon is recovered in the majority of cases, a precedent appears to have developed for both forensic image examiners and police officers to render opinions such as “appears to be a knife as it is shiny” without the application of any form of methodology. It is also common for those accused to claim the object is an e-cigarette, further confusing the analysis. Imagery from real casework will be shared to allow attendees to gain an understanding of the issue and why research into this area is essential.

The ability to render an opinion, and the reliability of such, is in direct correlation with the quality of the imagery and the features that an examiner believes are consistent with an object.

To address the above, the research presented tests the following hypothesis: the minimum dimensions required for a reliable opinion to be given in relation to an object purported to be a knife can be defined.

To test the proposed hypothesis, CCTV imagery of both knives and e-cigarettes of similar dimensions, colors, and materials were captured at decreasing resolutions in conditions mimicking real casework. These included differing encoding algorithms, environments, perspectives, and lighting. Analysis was then performed using a morphological analysis methodology until it was deemed of insufficient quality to draw a reliable opinion. Attendees will be presented with the detailed methodology and subsequent findings.

It is of the utmost importance that analysis of objects purported to be knives is as reliable as possible, since in a large number of these cases, the defendant is facing extended periods of imprisonment, especially if the alleged crime is murder. The research presented aims to go some way in increasing the reliability of any analysis performed in relation to such through an initial analysis suitability triage through the use of an acceptable object resolution threshold that can be utilized in casework.

Imagery Analysis, Video Forensics, Weapon Analysis