E55 Closed-Circuit Television (CCTV) Detection of National Security Threats Through On-Screen Identification of Text

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Learning Overview: After attending this presentation, attendees will understand the current problem within digital forensic data analysis in relation to the retrieval of text messages due to advancements in encryption in order to protect the privacy of the users. To combat this problem, current research has proposed a way to utilize the CCTV and devise a framework to guide which type of CCTV to use and how to configure the CCTV to support the task of screen monitoring on a personal mobile device (smart phone).

Impact on the Forensic Science Community: This presentation will impact the forensic science community by offering a novel approach to using CCTV aid with national security, not only against terrorists but also against any other illegal activities that would threaten the infrastructure of the country. Therefore, the ability of reading text on the phone screen could be exceptionally useful for anti-terrorism task forces.

As mobile phones are currently playing an important role in crime, from being used as a device for plotting bad deeds to being used to combat it, in the current academic literature, there is little coverage on the misuse of mobile phone for such purposes. As criminals change their communication and planning tactics, law enforcement has to think of a way to come up with preventive measures accordingly. Having said that, it is not the case that the current technology is incapable of achieving such a task, but it is more the case of not using the current technology to its maximum potential. This research aims to examine the usability of CCTV in a high traffic area (such as the airport) to test its impact on monitoring the content on a personal device.

The experiments have not proceeded to completion; however, the current results show promising future research for CCTV in this direction. With the usage of a 2.8mm 6MP Hikvision® EXIR Turret Network camera, text messages on the Messenger application on a Samsung® A70 phone can be read at brightness levels between 10%–70% from a distance of 1m. Best results can be obtained at 20%–30% brightness, which is a common phone setting while being indoor (in auto-adjust brightness mode). The best font size that can be picked up by the camera is between level 6 and level 8 (5mm–6mm text). Screen zoom is a function on Samsung® phones that is used to adjust the size of the content on the phone, such as text and User Interface (UI) elements. Screen zoom was used in this experiment as an attempt to further enhance or minimize the text. However, experiment results showed that it had no significant effect on the ability of the camera to pick up text on the phone screen. There were also no significant differences between capitalized text vs. normal text or bold text vs. normal text. Finally, there was no noticeable difference between dark mode and light mode in text detection between 10%–70% brightness.

CCTV, Phone Screen, Text Monitor

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