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A Study of Data Dissemination in CCTV Surveillance Systems

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Abstract—The world is moving towards automation in every field, which is the main motivational reason of recent researches. Automated CCTV surveillance systems have also drawn the attention of researchers since the last decade. In CCTV systems, data is collected from multiple sources with overlapping contents, which is mostly redundant and containing both informative and useless contents. Therefore, there is a need of effective data collection for which image prioritization methods can be used. Another major issue in CCTV surveillance systems is secure data dissemination to ensure the authenticity of important data for correct decision making. This paper presents an overview of different multimedia data security techniques such as image hashing, image encryption, image steganography and watermarking for data dissemination. Finally, we present our recommendations about combining multiple techniques together in a sequence to develop a more secure channel for data dissemination in CCTV surveillance systems. ¹

Keywords—*CCTV Video Analysis, Video Summarization, Data Dissemination, Image Hashing, Image Encryption, Image Steganography, Watermarking*

I. Introduction

CCTV surveillance systems consist of smart CCTV cameras, which are continuously capturing images of a particular area of interest ¹. Due to several cameras on a single scene and non-intelligent data recording of video stream, it produces a significant amount of redundant and non-informative video data which creates difficulties, such as searching of informative and useful data from the heap of collected data and also continuously loss of bandwidth ². A possible solution to this issue is to make CCTV system intelligent in a way that it simply record important data and send this useful information to the control room.

Although, recording of useful data is important, yet its secure transmission is also of paramount importance due to its dependency on the final decision. Therefore, the next step in the entire system is to provide security for data dissemination, which is the focus of this paper. There are different techniques for security of multimedia data in which image encryption ³, digital watermarking ⁴, image hashing, and steganography ⁵

are more remarkable ⁷ and can be used for other numerous applications such as authentication in social networks ⁸ and diagnostic hysteroscopy videos ⁹.

II. Effective Data Dissemination in CCTV Surveillance Systems

After collecting informative data by CCTV camera, it is necessary to ensure that the same and authentic data is received by control room to take any action or to give an alert signal to different departments such as police or fire brigade. This means that secure data dissemination has a key role in CCTV surveillance system. Fig. 1 describes the entire system with a focus on secure data dissemination in CCTV surveillance systems.

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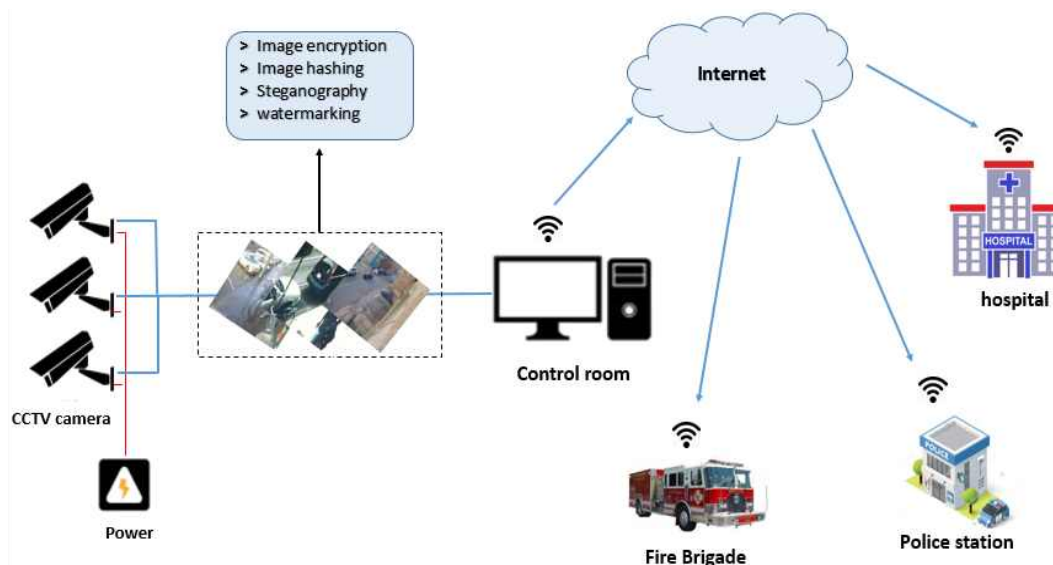


Fig. 1: Framework of data dissemination in CCTV camera surveillance systems.

III. Conclusion

Due to social, environmental and technical developments, the environment of a CCTV surveillance system experiences many changes during its lifecycle. Since the initial CCTV systems till now, the data is non-intelligently recorded, making a huge amount of data. This big size of data makes the efficient indexing, management, and searching for desired contents really difficult. Therefore, there is a need to useful data selection and its secure dissemination to control room. In this paper, we introduced the current CCTV system and discussed some recent data dissemination techniques that can be possibly used in these systems. Our recommendation is to integrate different data security techniques for better security model of data dissemination.

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