

Images Security in Wireless Sensor Networks (WSNs): A Comprehensive Review

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ABSTRACT: *For different reasons, such as sharing of the information or the data such as images play a very important role in the communication field. For information sharing over communication media, multiple image formats have been used for a few days now. In the field of digital image processing over wireless sensor networks, the confidentiality and privacy of images is a major challenge. This literature review article is a systematic survey of various challenges and current problems in the wireless sensor network domain and how further research can be address the current threats in this area. In recent years, wireless sensor networks are becoming more and more common as they are used globally. Numerous studies on particular applications in the arena of control and tracking as well as monitoring have been performed. The camera-enabled sensors are used by these engineered networks to provide critical data that is retrieved from the monitored fields for various applications. In order to provide more confidentiality and privacy in the modern world, this form of data needs more attention.*

KEYWORDS: *Confidential Data, Confidential Key, Mosaic Picture, Secure Communication, Target Picture, Wireless Sensor Networks,*

INTRODUCTION

In different fields, such as distant ecological monitoring as well as in object tracking and many others, the WSNs have various applications. Such types of sensors have a wireless interface through which communication takes place in the most acceptable and effective way according to the requirements of communication systems [1]. In recent years, comprehensive study in the field of WSNs around the globe has been carried out for many important purposes. These sensors have been widely used globally in some applications to provide more realistic solutions to current problems [2]. Due to technological developments around the world, modern communication devices and systems have been continuously replaced and hence these sensor networks have attracted more researchers to explore new methods for improving communication [3].

In the communication industry, image protection is a very significant concern because there are many kinds of communication channel problems, such as the different types of noise signal that degrade the image quality[4]. In recent years, numerous methods for processing images from the perspective of secrecy have been investigated and discovered [5]. In the current situation, the images that need to be transmitted must be processed well in compliance with safety issues. Until transmission through the communication media, there are numerous methods of encrypting the images. In recent years, numerous researchers have researched these methods to deliver more reliable communication over wireless sensor

networks worldwide [6]. Figure 1 shows the connectivity through the wireless sensor networks.

1.1 Security challenges and problems in WSNs:

In recent years, the WSNs have faced numerous threats relating to the privacy and confidentiality of pictures around the globe. In the image processing industry, this is a big challenge and a major problem to give the pragmatic confidentiality of essential data in various domains and applications that need more analysis and new approaches as needed by the users [7]. The WSNs are being utilized in various sectors namely the, military, healthcare, communication and environment to monitor various things which are important ones.

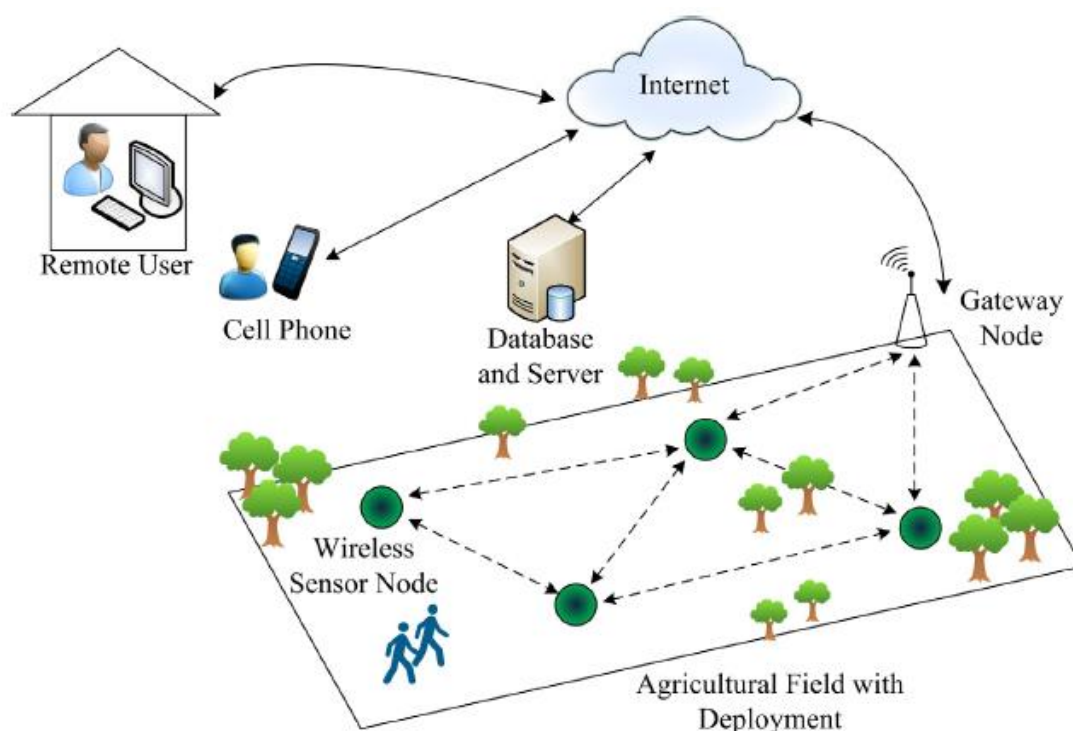


Figure 1: Illustrates the connectivity through the wireless sensor networks

1.2 Picture Mosaicking Analysis:

Image mosaicking is a method where more than two images of the similar image could be combined in a huge picture and a high resolution panorama created. It is helpful for constructing a bigger picture with numerous overlapping pictures of the same scene. The image mosaic development is the union of two pictures. The significance of image mosaicking in the sector of computer vision, medical imaging, satellite data, and army automatic target recognition can be seen. Picture stitching can be performed from a broad angle video taken from left to right to develop a wide-scale panorama to obtain a high-resolution picture.

LITERATURE REVIEW

Akyildiz et al. conducted a survey on the wireless sensor networks. The definition of sensor networks, made viable by the convergence of micro-electro-mechanical systems technology, wireless communications and digital electronics, is presented in this paper. First, the sensing tasks and the possible applications for sensor networks are discussed and a review is presented of factors affecting the design of sensor networks. Then, the communication architecture for sensor networks is drawn, and the algorithms and protocols developed for each layer in the literature are explored[7].

Alemdar explored conducted another survey on the wireless sensor network and its importance in the healthcare. Wireless sensor network innovations are regarded as one of the main research areas in the computer science and healthcare application industries to become mature enough to be used to enhance the quality of life. With constant surveillance, the omnipresent healthcare networks provide rich contextual knowledge and alerting mechanisms against odd conditions. This minimizes the need for caregivers and allows the chronically ill and elderly to survive an independent life, as well as offering quality treatment for babies and small children whose parents both have to work[8].

DISCUSSION AND CONCLUSION

Where highly secure data communication is necessary, the confidentiality of data or information plays a key role. Enough studies and investigations have been carried out in the field of image processing via the wireless sensor network, which is a major concern from a security perspective in the modern world. Due to various factors in numerous applications, protection mechanisms may be invaluable in the WSNs arena. Recent and new research have been carried out based on the state-of-the-art mechanism to deliver the different levels of safe infrastructure in conjunction with the WSNs' available and existing resources.

Many methods have been investigated to achieve a high level of data security during communications, such as image mocking, and certain algorithms are invented to create mosaic images with these algorithms, but there is still a huge concern and demand to make transmission more efficient by applying different algorithms of image encryption. In this literature review, some algorithms and techniques have been discussed, but there is more to explore for the high level of security maintenance in this area. This completed analysis has provided substantial assistance in the field of WSNs to examine safety problems in order to resolve them. There is a pragmatic scope in the domain of the wireless sensor network to explore new method and techniques for secure image processing.

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