Scientific Journal of Impact Factor (SJIF): 4.72

e-ISSN (O): 2348-4470
p-ISSN (P): 2348-6406

International Journal of Advance Engineering and Research Development

Volume 4, Issue 3, March -2017

Medical Image Compression and Decompression Maintaining Location Privacy and QoS

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Abstract —*The Internet of Things (IoT) is a network of physical devices, vehicles, buildings and various other items-embedded with electronics, sensors, actuators etc. that enable these things to collect and exchange data. If one thing can prevent the IoT from transforming the way we live and work, it will be a breakdown in Security. Traditional security mechanisms like Configuring Firewall, Intrusion Detection and Prevention Systems are deployed at the Internet edge. These mechanisms are used to protect the network from external attacks. Such mechanisms are no longer enough to secure the next generation internet. The borderless architecture of the IoT raises additional concerns over the network access control and software verification. In order to maintain the integrity of thedata sent and the confidentiality of the data collected, security must be built into the design of the devices and systems to create trust in both the hardware and the integrity of the data. Considering the rapid growth of the IoT, the project proposes an improvised framework for the future development of security and privacy standards in the Internet of Things.*

Keywords: *Image compression and decompression; encryption; location privacy; QoS*

I. INTRODUCTION

The disaster such as flood or forest fire has drawn ever increasing attention to improving rescue efforts. The technique that can be applied from the recovery of disaster is known as telemedicine, which is the combination of information technology and science. The RMM system is a remote station which collects the health data of patients in the disaster area. The health information such as images from the disaster area is transmitted from the primary health care station to the community centre via WANET. The WANET are spotted in the disaster area as small sensor nodes. The RMM system requires the efficient approach for the limited battery power of sensor nodes and energy efficiency to obtain the QoS of WANET. This approach is proposed by the optimization of lossless compression technique in medical data. It reduces the size of MDPs. This technique is used for compressing and decompressing the MDPs in PHC station as well as CC centre. It also proposes a fuzzy logic based route selection technique. It is an effective technique to transmit the compressed data and maximize the life time of WANET. The FRS technique is effective for the route selection of MDP from PHC station to CC centre. It only uses less energy and reduces the packet loss during the transmission.

II. LITERATURE SURVEY

1] Title: Secure Privacy-preserving Medical Image Compression (SUPERMICRO)
Authors: Shuang Wang*, Xiaoqian Jiang*, LucilaOhno-Machado
In this paper, we develop a Secure Privacy-preserving Medical Image Compression (SUPERMICRO) frameworkon distributed source coding (DSC), which encrypts the data possible without compromising onsecurity and efficiency. Our approach makes sure the data transmission and storage in a privacy maintainingmanner.

2]Title:Geographic Routing for Wireless Networks
Authors: Brad Nelson Karp
A wide variety of ad-hoc routing algorithms have been approached in the literature. By way of introduction, we focus on Dynamic Source Routing (DSR); we compare GPSRwith DSR later in the thesis, because DSR has been performing better than manyother published routing algorithms. In DSR, packets are routed using *source routes*.Forwarding such a packet amounts to finding the next hop in the listof hops, and sending the packet to the appropriate neighbor. All nodes in the network. Thus, DSR is an *on-demand* routing protocol.

3] Title: Color LAR codec: a color image representation andcompression scheme based on local resolutionadjustment and self-extracting region representation
Authors: Olivier D_eforges, Marie Babel, Laurent B_edat, Joseph Ronsin

The main objective while designing an image coding methodis to get a solution that has a power in terms of compression.LAR image can be used to encode two chromatic componentsat a region level. We investigate a third methodwhich consists of creating a segmentation based mainly of the luminance component and controlled at the coder byadditional chromatic information.

4]Title: Medical Data Compression and Transmissionin Wireless Ad Hoc Networks
Authors: Tanima Dutta
In this paper, we study an energy-efficient connectivityproblem in WANETs. We assume that nodes are deployed randomlyin disaster area independent of each other. To enhancethe network lifetime, we propose a visually lossless compressiontechnique for MDPs and a fuzzy-logic based routeselection technique to transmit compressed MDPs.

5]Title:IEEE Communications Magazine Volume 55
Authors: Jun Zhou, Zhenfu Cao, Xiaolei Dong, and Athanasios V. Vasilakos
The Internet of Things (IoT) is composed of physical objects embedded with electronics, software, and sensors, which allows objects to be sensed and controlled remotely across the existing network infrastructure, facilitates direct integration between the physical world and computer communication networks, and significantly contributes to enhanced efficiency, accuracy, and economic benefits. Therefore, IoT has been widely applied in various applications such as environment monitoring, energy management, medical healthcare systems, building automation, and transportation. Unfortunately, due to the resource constraints of IoT devices, they always delegate highly complex computation to the energy abundant cloud for considerably enhanced efficiency. However, both the inputs, outputs, and function of the underlying computation may be closely related to the privacy of IoT users, which cannot be exposed to collusion between malicious cloud servers and malicious IoT users. Therefore, how to design new efficient privacy-preserving solutions for next generation mobile technologies with IoT–cloud convergence is a crucial issue of great concern.

6]Title:Modified AODV for Multi-Constrained QoS Routing and Performance Optimization in MANET
Authors: Amina Akhter, Teerapat Sanguankotchakorn
A MANET comprises of some mobile nodes capable of moving freely. It can operate independently, or may haveattachment at some point(s) or gateways to the fixed network. The ability to operate as infrastructure-less network aswell as relative ease of deployment have made MANET an attractive choice for various emergency communications like post disaster rescue operations, military applications andinstant communications such as meetings and conferencesetc.Future applications of MANETs are expected to be based on all-IP architecture and be capable of carrying multitude real-time multimedia applications such as voice, video as well as data. These applications require some guaranteed level of performance in terms of delay and bandwidth. In order to ensure quality transmission and reception of these applications, MANET has to provide QoS support. QoS routing in MANET must be deployed to serve this purpose. The goal of QoS routing is to set up a loop-free pathsatisfying a given set of QoS constraints like bandwidth anddelay. If network QoS is not in place, real time traffic like IPvoice or videoconferencing calls will be unreliable, inconsistent, and often unsatisfactory. QoS provisioning in MANET is more challenging fortwo of its unique characteristics: the mobility of nodes whichcauses the network topology to be changed dynamically and the shared wireless medium.

7] Title: Watermarking and Encryption in Medical Image through Roi-Lossless Compression
Authors:S. Nithya, K. Amudha
The watermarking is an efficient method is used for copyright protection, copy protection, proof of the ownership identification, treatment, education, military, etc. The important message in a covered media while, digital watermarking is a way of hiding a secret or private communication to provide the copyright and data integrity. The watermarking process may be unique to the each copy or multiple copies should be used. The watermarking is consisted of two processes, one is embedding and another one is extracted process. During the embedding process, watermarking is embedded in to the digital data The original digital data slightly modified after embedding the watermark this modified data is also called as the watermarking data. While in extraction process this embedded watermarking is extracted from the watermarking data and recover the original multimedia data. The exact algorithms for embedding and extraction the watermarking do not help an illegal party to detect the presence of the watermark or remove it. Number of reason is used to the medical information used to the watermarking. The digital data include the text, image, audio and video.

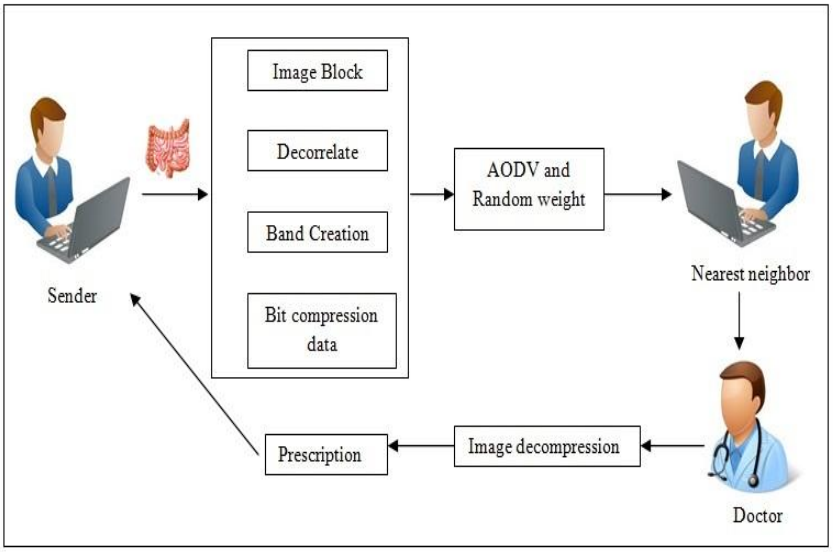
III. PROPOSED SYSTEM

We planned a system where an image can be sent maintaining its location and preserving its QoS. Initially an image is taken and it is then divided into blocks. Then this blocks are divided into smaller parts and then the common variables are then brought together and then correlated.The location privacy is maintained and the smallest path is maintained using Djkstra's.

ADVANTAGES OF PROPOSED SYSTEM:

1. The main and important advantage of this system is that this system can be used for any image format.
2. It ensures location privacy.
3. It performs lossless compression and decompression and the quality of image is not hampered.

SYSTEM ARCHITETURE



IV. OBJECTIVE

1) To compress and decompress an image and secure it using compression and decompression techniques.
2) To secure the image's location while sending the image to the receiver (doctor) and back to the sender (Patient).
3) To preserve the Quality of Service (QoS) while transmitting the image.

V. MOTIVATION

Maintaining security in IOT is the main motivation behind this and also to avoid congestion in it.

VI. CONCLUSION

Proposed systems successfully encrypt the medical image that need to be sent to the doctor over internet less facility using WANET. To reduce the congestion of the network system incorporates tree base compression technique for the data. And the compressed data is transferred over the network using sufficient AODV routing protocol, which eventually found its shortest path using Djakarta.

ACKNOWLEDGMENT

We wish to impart the analysts and conjointly distributers for creating their assets accessible. We have a tendency to in addition appreciative to commentator for his or her vital recommendations moreover impart the varsity powers for giving the duty-bound base and backing.

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