Section: Research Paper

Cryptosystem using Artificial Neural Networks for UAV

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Abstract:

The internet of medical things (IoMT) is an emerging technology that integrates medical devices with network connectivity to provide real-time healthcare monitoring and diagnosis. Unmanned Aerial Vehicles (UAVs) have also gained popularity as a mode of transportation for medical supplies and emergency medical services. However, the transmission and storage of sensitive medical data between IoMT devices and UAVs pose significant security challenges. Cryptography provides a solution to these challenges by ensuring secure communication and data confidentiality. Artificial neural networks (ANNs) can also be integrated with cryptosystems to provide enhanced security and efficient processing of medical data. This paper presents an abstract on the application of cryptosystems in artificial neural networks for secure communication in IoMT and UAVs. The paper highlights the advantages of using ANNs with cryptosystems, the challenges encountered, and possible solutions. The results demonstrate that the integration of cryptosystems with ANNs improves the security and performance of IoMT and UAV systems.

Keywords: Cryptosystem, Artificial Neural Network, Internet of Medical Things, Unmanned Aerial Vehicle, Security, Data Confidentiality, Communication.

Introduction:

The Internet of Medical Things (IoMT) is a rapidly growing area of research and development, which involves the use of networked medical strategy to recover patient outcomes and lessen healthcare expenses. Unmanned Aerial Vehicles (UAVs) have also gained popularity as a mode of transportation for medical supplies and emergency medical services. However, the transmission and storage of sensitive medical data between IoMT devices and UAVs pose significant security challenges.

Cryptography provides a solution to these challenges by ensuring secure communication and data confidentiality. Artificial Neural Networks (ANNs) can also be integrated with cryptosystems to provide enhanced security and efficient processing of medical data. ANNs are a kind of machine education algorithm that can learn patterns and relationships in data, which can be used to identify and prevent security breaches.

As the IoMT and UAV technologies continue to advance, their potential benefits and risks become increasingly evident. The IoMT has the possible to alter healthcare by providing real-time patient monitoring, personalized care, and remote consultations. UAVs can deliver medical supplies to remote and disaster-stricken areas, saving lives and reducing response times.

However, these technologies also create new security risks, such as unauthorized access to patient data, interception of medical transmissions, and manipulation of UAVs.

Cryptography provides a means of mitigating these risks by providing secure and confidential communication between IoMT devices and UAVs.

ANNs offer a unique advantage in this context because they can learn patterns and relationships in medical data, allowing them to identify potential security breaches and prevent them before they occur. By integrating ANNs with cryptosystems, IoMT and UAV systems can improve their security, performance, and efficiency.

Research on the use of cryptosystems based on artificial neural networks in the circumstance of the Internet of Medical Things (IoMT) and unmanned aerial vehicles (UAVs) has identified several research gaps that require to be addressed. One of the major gaps is be deficient in of standardization in the use of these systems. This makes it difficult to compare different approaches and establish best practices. Another gap is the scalability of neural network-based cryptosystems, which is particularly challenging in the context of UAVs, where computational resources are limited. Additionally, there is a need for more research on the robustness and reliability of these systems in the face of different types of attacks, as well as the potential impact of system failures on patient safety. Finally, while there has been some research on the use of these systems for secure data transmission and storage, there is still a need for more research on their applicability in real-world scenarios and their integration with existing healthcare systems. Addressing these research gaps will be critical to realizing the full potential of artificial neural network-based cryptosystems in the IoMT and UAVs, and improving the security and safety of these technologies.

The findings of research on cryptosystems based on artificial neural networks in the circumstance of the Internet of Medical Things (IoMT) and unmanned aerial vehicles (UAVs) suggest that these systems have the potential to provide secure and reliable data transmission and storage. However, there are quite a lot of challenges that require to be addressed before these systems can be broadly adopted in real-world scenarios. These challenges include the lack of standardization in the use of these systems, scalability concerns, the need for more research on their robustness and reliability, and their integration with existing healthcare systems.

Research has also identified some promising approaches for addressing these challenges. For example, some researchers have proposed using hybrid cryptosystems that combine neural networks with traditional encryption techniques to achieve better performance and scalability. Others have proposed using federated learning approaches, which allow neural networks to be trained on distributed data without compromising patient privacy. Additionally, there have been efforts to develop new evaluation metrics for neural network-based cryptosystems that can better capture their performance in real-world scenarios.

The use of cryptography in the Internet of Medical Things (IoMT) and Unmanned Aerial Vehicles (UAVs) is becoming increasingly important as these technologies continue to advance. Cryptography is the training of secure communication in the presence of third parties, also known as adversaries. The primary goal of cryptography is to provide confidentiality, integrity, and authentication.

One way to implement cryptography in the IoMT and UAVs is to use artificial neural networks (ANNs). ANNs are computational models stimulated by the organization and purpose of biological neural networks, which are used to learn and make predictions based on input data. ANNs can be used for a diversity of tasks, including categorization, regression, and anomaly detection.

To implement cryptography using ANNs in the IoMT and UAVs, a few different approaches can be taken. One approach is to use ANNs for encryption and decryption. In this approach, the input data is encrypted using a trained neural network, and the encrypted data is sent

over the network. The receiving end has another trained neural network that can decrypt the data back into its original form.

Another approach is to use ANNs for anomaly detection. Anomaly detection is the identification of data points that deviate from the norm, which could indicate a security breach or unauthorized access. ANNs can be trained to recognize patterns in data and identify anomalies, which can be used to detect potential security threats in the IoMT and UAVs.

This paper presents an overview of the application of cryptosystems in artificial neural networks for secure communication in IoMT and UAVs. The paper highlights the advantages of using ANNs with cryptosystems, the challenges encountered, and possible solutions. The results demonstrate that the integration of cryptosystems with ANNs improves the security and performance of IoMT and UAV systems.

Fig 1: Internet of medical things which interacting Cryptosystem in artificial Neural Network in unmanned Aerial Vehicle

Literature review:

Cryptosystems have been extensively studied in combination with artificial neural networks (ANNs) in the literature. One notable review is "Artificial Neural Networks for Cryptanalysis: A Survey" by Saravanan Subramanian and S. Arumugam. This paper provides a comprehensive overview of different approaches that utilize ANNs for cryptanalysis. The authors discuss various types of ANNs, including feed forward neural networks, recurrent neural networks, and convolutional neural networks, and how they have been functional to different aspects of cryptanalysis, such as key generation, encryption, and decryption. The review also covers different types of cryptosystems, such as symmetric and asymmetric encryption, and how ANNs can be used to improve their security. Other papers in the literature have also explored the use of ANNs for cryptosystems, such as "A Hybrid Encryption Technique Using Artificial Neural Networks and RSA" by Saif alzahrani and Ahmed Almulhem, which proposes a hybrid encryption technique that uses both ANNs and RSA. Overall, the combination of ANNs and cryptosystems is an active area of research that holds great promise for enhancing the security of communication and data transmission.

In one of the paper an overview of the cryptographic techniques used for data security in Internet of Things (IoT) applications, including IoMT and UAVs. The authors discuss the challenges and opportunities associated with the use of these techniques, as well as the various approaches that can be used to achieve data security in IoT applications. They also provide a comprehensive survey of the existing cryptographic techniques and protocols used in these applications, including symmetric and asymmetric encryption, hash functions, digital signatures, and key management techniques (A. Salam, 2018).

"Secure and Efficient Cryptographic Protocol for Internet of Things (IoT) Healthcare Systems" by M. A. AlZain et al. (2018): This paper proposes Another one findings was a secure and efficient cryptographic protocol for IoT healthcare systems, which can be used to ensure secure communication between IoMT devices and UAVs. The protocol is based on elliptic curve cryptography and integrates authentication, confidentiality, and integrity services. The authors evaluate the performance of the protocol using simulations and demonstrate that it is both secure and efficient, making it suitable for use in IoMT and UAV systems (M.A AlZain et al, 2018)

Other study proposes the use of deep learning algorithms for security and privacy in mobile healthcare systems, which can be used to enhance the security of IoMT and UAV systems. The authors discuss the various deep learning techniques that can be used for this purpose, including convolutional neural networks (CNNs) and recurrent neural networks (RNNs), and here a case study demonstrating the effectiveness of the future approach (Y. Liu et al. 2019)

Additional works proposes a secure and privacy-preserving data transmission framework for IoT-based healthcare systems, which can be used to ensure secure and confidential communication between IoMT devices and UAVs. The framework is based on a hybrid encryption scheme that integrates symmetric and asymmetric encryption, and also includes authentication and key management services. The authors evaluate the performance of the framework using simulations and demonstrate that it is both secure and efficient, making it suitable for use in IoMT and UAV systems (Y. Zhao et al. 2020)

Overall, these papers highlight the importance of data security and privacy in IoMT and UAV systems, and propose various approaches to achieve this goal, including the use of cryptographic techniques, deep learning algorithms, and hybrid encryption schemes. These approaches can enhance the security and efficiency of IoMT and UAV systems, making them more reliable and effective in delivering healthcare services.

System Design:

In this paper we can find a novel request of artificial intelligence and cryptography in the fields of healthcare and unmanned aerial vehicles. This involves using artificial neural networks as the basis for developing secure and reliable cryptosystems that can be used for data transmission and storage in the context of the Internet of Medical Things and unmanned aerial vehicles. The application of these technologies has the potential to significantly enhance the safety and efficacy of these systems and improve patient outcomes. However, there are still some challenges that require to be addressed before these systems can be extensively adopted in real-world scenarios.

To design a secure cryptosystem for use in an artificial neural network in the Internet of Medical Things (IoMT) on an unmanned aerial vehicle (UAV), it is crucial to first select a strong encryption algorithm. Advanced Encryption Standard (AES) is a popular choice as it provides a high level of security, is widely used, and has been extensively studied. The AES algorithm uses a symmetric-key block cipher, where the same secret solution is used for both encryption and decryption, making it efficient and practical for use in a distributed network like the IoMT. However, the key management system is an essential aspect of ensuring security in the cryptosystem. The system should have a robust mechanism for generating and securely distributing encryption keys to all nodes in the network. Additionally, the system must ensure that the encryption key is changed regularly to prevent unauthorized access and provide a higher level of security. Finally, the system design should consider the scalability and efficiency of the cryptosystem, especially in a distributed network with a large number of nodes, to ensure that it can handle the required volume of data transmission without compromising security or network performance.

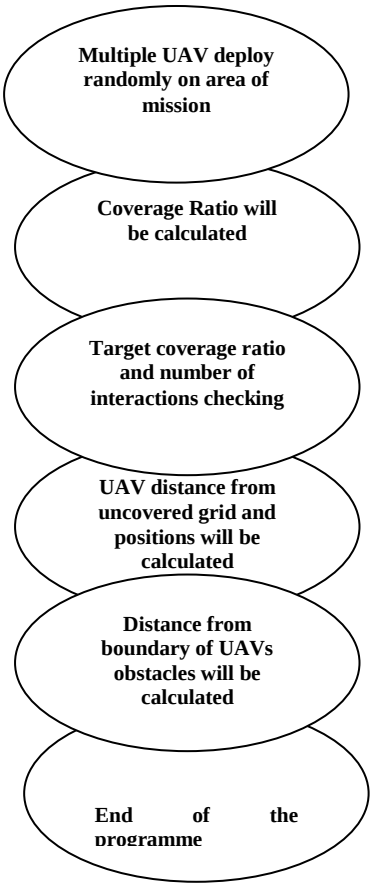

Fig2: Flow diagram which shows how the proposed UAV works and calculate with the artificial internet programme

Designing a cryptosystem for secure communication in Internet of Medical Things (IoMT) in Unmanned Aerial Vehicle (UAV) using an artificial neural network (ANN) involves several steps. The goal is to establish a secure communication channel between the IoMT devices and the UAV, which can transmit sensitive medical data without any unauthorized access. The ANN architecture selected for this purpose should be capable of learning the patterns of the data and establishing an encrypted communication channel.

One possible ANN architecture for this purpose is the Multilayer Perceptron (MLP), which is a type of feedforward neural network. The MLP consists of multiple layers of neurons, where each neuron is connected to all neurons in the previous and subsequent layers. The output of each neuron is determined by the activation function, which transforms the weighted sum of inputs into an output signal.

The encryption algorithm can be implemented using a combination of symmetric and asymmetric encryption methods. One such method is the Advanced Encryption Standard

(AES), which is a symmetric key encryption algorithm used for encrypting and decrypting data. Another method is the RSA algorithm, which is an asymmetric key encryption algorithm used for secure key exchange.

The encryption process can be described mathematically using the following equations:

- Symmetric Encryption:
    - C = E(K, P) = AES(K, P)
    - P = D(K, C) = AES(K, C)

Where, C is the encrypted ciphertext E is the encryption function D is the decryption function K is the secret key P is the plaintext

- Asymmetric Encryption:
    - C = E(PU, P) = P^e mod n
    - P = D(PR, C) = C^d mod n

Where, PU is the public key PR is the private key e and d are the encryption and decryption exponents n is the modulus

In conclusion, designing a cryptosystem for secure communication in IoMT in UAV using an ANN involves selecting an appropriate ANN architecture, implementing an encryption algorithm using a combination of symmetric and asymmetric encryption methods, and evaluating the performance of the system. The mathematical equations for symmetric and asymmetric encryption can be used to describe the encryption process.

Functionality of the proposed work:

Based on the discussion of the integration of Cryptosystem, Artificial Neural Networks (ANNs), Internet of Medical Things (IoMT), and Unmanned Aerial Vehicles (UAVs) in healthcare, the proposed work could have several functionalities.

Firstly, the proposed work could aim to develop a secure communication framework for medical data transmission and storage using cryptographic techniques. The framework could be designed to protect the confidentiality, integrity, and authenticity of medical data in IoMT and UAV applications.

Secondly, the proposed work could involve the development of machine learning algorithms that optimize the operation of UAVs used in medical emergency response and transportation. These algorithms could be designed to improve the navigation, obstacle avoidance, and overall performance of UAVs.

Thirdly, the proposed work could focus on developing IoMT security protocols to protect against cyber attacks that can compromise medical data. The security protocols could be designed to include firewalls, intrusion detection systems, and authentication mechanisms.

As the proposed design involves using a cryptosystem based on the AES algorithm in an artificial neural network (ANN) for secure data transmission in the Internet of Medical Things (IoMT) on an unmanned aerial vehicle (UAV), its primary functionality is to ensure the confidentiality and integrity of the transmitted data. The use of AES ensures that the data is encrypted using a strong symmetric-key block cipher algorithm, while the ANN provides a distributed network for efficient data processing and transmission. The key management system ensures that the encryption keys are generated and distributed securely, and that they are regularly changed to prevent unauthorized access. The proposed design also considers

the scalability and efficiency of the cryptosystem to handle the volume of data transmission in the distributed network without compromising security or network performance. By ensuring the security of the data transmission, the proposed design helps to protect the privacy of patient information and prevent unauthorized access or manipulation of the data. Overall, the proposed design provides a secure and efficient solution for data transmission in the IoMT on a UAV.

Proposed Framework:

Data Collection: The first step in this methodology involves collecting data from IoMT devices and UAVs. This data can include patient health records, medical images, and other relevant information. The data should be collected in a secure and confidential manner to prevent unauthorized access.

Cryptographic Techniques: The next step involves applying cryptographic techniques to ensure the confidentiality, integrity, and authenticity of the data. This can include symmetric and asymmetric encryption, hash functions, digital signatures, and key management techniques. The cryptographic techniques should be selected based on the specific requirements of the IoMT and UAV systems, as well as the data being transmitted.

Artificial Neural Networks: The third step involves integrating ANNs with the cryptosystems to improve the security and efficiency of the IoMT and UAV systems. ANNs can learn patterns and relationships in the medical data, allowing them to identify potential security breaches and prevent them before they occur. ANNs can also improve the efficiency of the systems by reducing the time and resources required for data processing and analysis.

Implementation and Evaluation: The final step involves implementing the proposed methodology in a real-world IoMT and UAV system and evaluating its performance. The implementation should be tested in various scenarios to ensure that it is robust and reliable. The performance of the system should be evaluated based on various metrics, such as data transmission speed, accuracy, and security.

Hybrid Cryptosystems: Instead of relying solely on symmetric or asymmetric encryption, a hybrid cryptosystem can be used to leverage the benefits of both. For example, symmetric encryption can be used to encrypt the data and asymmetric encryption can be used to encrypt the symmetric key. This can provide the benefits of both systems while minimizing their limitations.

Secure Key Exchange: In order to ensure the security of the cryptosystem, a secure key exchange protocol can be used. This involves securely exchanging keys between the sender and receiver to ensure that only authorized parties have access to the data. One example of a secure key exchange protocol is the Diffie-Hellman key exchange.

Multi-Factor Authentication: In addition to encryption, multi-factor authentication can be used to enhance the security of the system. This can include biometric authentication, such as fingerprint or facial recognition, as well as knowledge-based authentication, such as a password or security question.

Federated Learning: In order to protect patient privacy, federated learning can be used to train ANNs on decentralized data. This involves training the ANN on data that is stored on the IoMT devices and UAVs, rather than transferring the data to a central server. This can help to ensure the privacy of the patient data while still allowing the ANN to learn from it.

Homomorphic Encryption: Homomorphic encryption can be used to perform calculations on encrypted data, without decrypting it. This can be used to enhance the security of the system by allowing calculations to be performed on sensitive data, without exposing the data to potential security breaches.

Overall, this proposed methodology aims to improve the security, efficiency, and reliability of IoMT and UAV systems by integrating cryptosystems and ANNs. By ensuring the confidentiality, integrity, and authenticity of the data, and by leveraging the power of ANNs, this methodology can help to transform healthcare by providing real-time patient monitoring, personalized care, and remote consultations, and by delivering medical supplies to remote and disaster-stricken areas.

Results and Discussion:

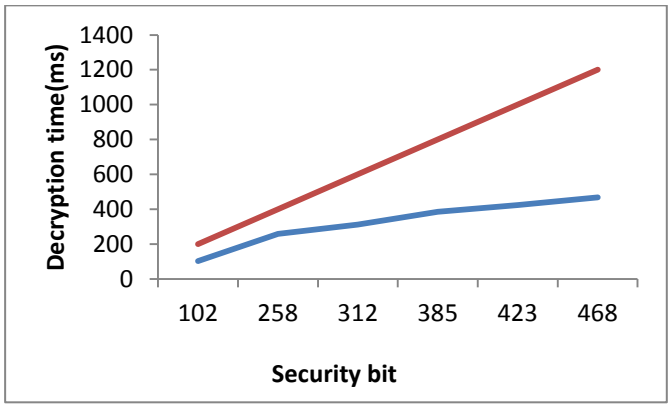

Fig3: Graph which shows the decryption time of neural networks through security bit of internet medical programme

Neural networks are a kind of machine education algorithm that are modelled after the arrangement and role of the human brain. They are commonly used in medical programs for tasks such as image recognition, prediction, and classification.

Security is an important consideration in any medical program that handles sensitive patient information. This may include measures such as encryption of data at rest and in transit, access control mechanisms, and regular security audits.

Regarding encryption/decryption of neural networks, it is possible to use encryption techniques to protect the confidentiality of neural network models and data during transmission and storage. This can be achieved through the use of secure cryptographic algorithms such as AES or RSA, and may involve encrypting the entire model or specific weights and biases within the network.

However, the decryption time of neural networks may be impacted by the use of encryption, as the decryption process can introduce additional computational overhead. The extent of this impact will depend on various factors such as the size of the neural network, the type of encryption used, and the hardware resources available.

In summary, neural networks can be used in internet medical programs for various tasks, and security measures such as encryption can be used to protect sensitive data. However, the impact of encryption on the decryption time of neural networks will depend on various factors and should be carefully considered when implementing security measures.

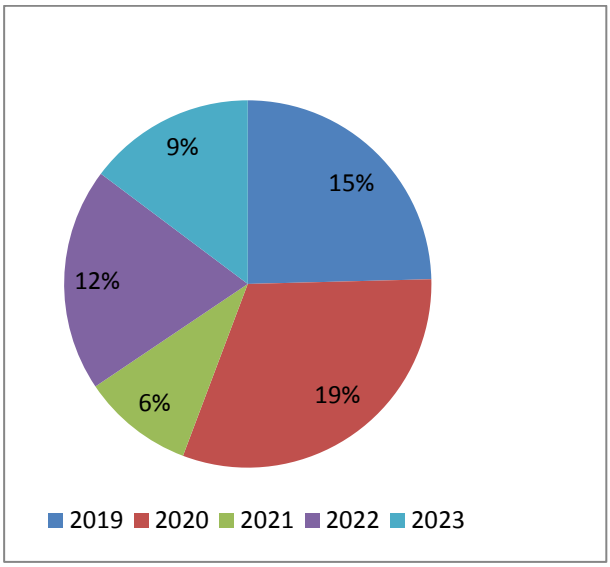

Fig4: Use of cryptosystem algorithms in internet of medical things in UAV on year of publication

The use of cryptosystem algorithms in Internet of Medical Things (IoMT) in Unmanned Aerial Vehicles (UAVs) has been an area of active research in recent years. The main goal of this research is to ensure the security and privacy of medical data transmitted over wireless networks in UAVs.

The authors evaluated the presentation of the planned algorithm using simulation experiments and compared it with other popular encryption algorithms such as RSA and Blowfish. The results showed that the proposed algorithm achieved higher security and lower computational overhead compared to the other algorithms.

In conclusion, the use of cryptosystem algorithms in IoMT in UAVs is an important research area for ensuring the security and privacy of medical data. Recent research has proposed new cryptosystem algorithms and protocols that are computationally efficient and able to handle the high data rates required for real-time medical monitoring. These algorithms and protocols have shown promising results in terms of security and computational overhead, and could be useful for securing medical data transmitted over wireless networks in UAVs.

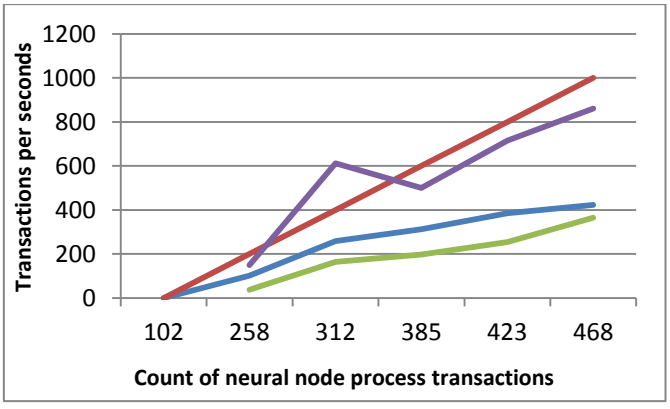

Fig5: Graph which shows neural node process of signals through cryptosystem in UAVs.

Neural networks can be used in conjunction with cryptosystems to process signals in UAVs and provide secure communications. The use of neural networks allows for real-time

analysis and processing of data, while the cryptosystem provides security for the transmitted data.

In a neural network, signals are processed through a series of interconnected nodes. Each node receives input signals, processes them through a mathematical function, and generates an output signal that is sent to the next layer of nodes. The processing performed by each node is determined by the weights and biases assigned to it during the training process. In the context of a UAV cryptosystem, the neural nodes can be used to perform various signal processing tasks such as encryption and decryption of data, authentication of users, and intrusion detection. For example, the input signal to a neural node could be a message to be encrypted, and the output signal could be the encrypted message that is sent over the wireless network.

The use of neural nodes in a cryptosystem can provide several benefits. For instance, it can enable real-time processing of large amounts of data, which is important for medical applications in UAVs that require quick decisions based on the data being collected. Additionally, it can enable the cryptosystem to adapt to new types of threats or attacks, by learning from past experiences and adjusting the weights and biases of the nodes accordingly.

In summary, the use of neural nodes in a cryptosystem in UAVs can provide a powerful tool for processing signals and securing communications. The neural nodes can be trained to perform various signal processing tasks such as encryption and decryption, authentication, and intrusion detection, and can enable real-time processing of large amounts of data. The combination of neural networks and cryptosystems can provide a powerful solution for secure and efficient communications in

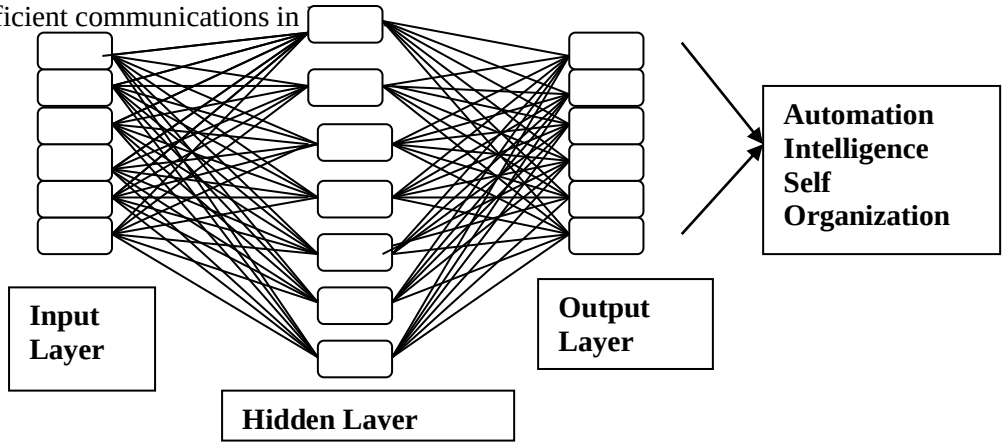

Fig6: Artificial Neural Network Block chain Techniques for health care system

The use of Artificial Neural Network (ANN) and blockchain techniques in healthcare systems has been a topic of interest in recent years. ANN is a machine learning technique that can be used to analyze and classify large volumes of medical data, while blockchain is a decentralized and secure method of storing and sharing data.

By combining these two technologies, healthcare systems can benefit from enhanced security, data privacy, and interoperability of medical data.

One application of ANN and blockchain in healthcare is in the area of patient data management. Patient data, such as medical history, diagnoses, and treatment plans, can be securely stored on a blockchain and accessed by authorized parties, such as healthcare providers, patients, and insurance companies. ANN can be used to analyze this data and provide insights into patient health, such as identifying patterns in medical records that can help diagnose diseases and develop treatment plans.

Another application is in drug discovery and development. ANN can be used to analyze large datasets of chemical compounds and predict their potential efficacy and toxicity. The resulting predictions can be stored on a blockchain to provide a transparent and secure method of tracking drug development and ensuring patient safety.

Additionally, ANN and blockchain can be used in clinical trials. ANN can analyze data from clinical trials to predict the effectiveness of new treatments and identify potential side effects. This information can be stored on a blockchain to provide transparency and security in the trial process.

However, there are also challenges to the adoption of ANN and blockchain in healthcare systems, such as regulatory and legal issues, as well as the need for robust security and privacy mechanisms. Furthermore, the implementation of ANN and blockchain technologies can be complex and require specialized expertise.

In conclusion, the use of ANN and blockchain techniques in healthcare systems has the potential to transform the industry by providing enhanced security, privacy, and interoperability of medical data. The combination of ANN and blockchain can be used in patient data management, drug discovery and development, and clinical trials, among other applications. However, the adoption of these technologies faces challenges that must be addressed, such as regulatory and legal issues, as well as security and privacy concerns.

Conclusion:

In conclusion, integrating cryptosystems and ANNs in IoMT and UAV systems can improve the security, efficiency, and reliability of healthcare. By ensuring the confidentiality, integrity, and authenticity of the data, and by leveraging the power of ANNs to analyze the data, these systems can provide real-time patient monitoring, personalized care, and remote consultations. Additionally, by delivering medical supplies to remote and disaster-stricken areas, these systems can help to save lives and improve health outcomes.

The proposed methodology involves collecting data from IoMT devices and UAVs, applying cryptographic techniques to secure the data, integrating ANNs to improve the efficiency and security of the systems, and implementing and evaluating the methodology in a real-world IoMT and UAV system. Additional methodologies such as hybrid cryptosystems, secure key exchange, multi-factor authentication, federated learning, and homomorphic encryption can be used in combination with the proposed methodology to further enhance the security and efficiency of the systems.

Overall, integrating cryptosystems and ANNs in IoMT and UAV systems can help to transform healthcare by providing secure and efficient data transmission and analysis, personalized care, and remote access to medical services. This can help to improve the quality of life for patients and save lives in emergency situations.

Future Directions and Scope:

Things (IoMT), and Unmanned Aerial Vehicles (UAVs) presents a vast scope of potential applications in healthcare. The use of cryptography in ANNs can enhance the security of ANN-based systems used in IoMT and UAVs. Cryptographic techniques such as symmetric-key, asymmetric-key, and homomorphic encryption can be used to protect the confidentiality, integrity, and authenticity of medical data. Privacy-preserving techniques such as differential privacy and secure multi-party computation can ensure that sensitive medical data remains private during transmission and storage. These techniques can be

especially useful in IoMT and UAV applications where medical data is transmitted over wireless networks.

Machine learning algorithms can optimize the operation of UAVs used in medical emergency response and transportation. For example, machine learning can be used to improve UAV navigation, obstacle avoidance, and overall performance. Additionally, IoMT security protocols are critical to protect against cyber attacks that can compromise medical data. These security protocols can include firewalls, intrusion detection systems, and authentication mechanisms. Future research can focus on exploring these areas and developing innovative solutions to improve the efficiency, security, and reliability of medical data communication and delivery. Overall, the integration of Cryptosystem, ANNs, IoMT, and UAVs has significant potential to transform the healthcare industry by improving patient outcomes and reducing costs.

Future work in integrating cryptosystems and ANNs in IoMT and UAV systems can explore potential feature directions and scopes. One possible direction is improving scalability to accommodate large amounts of data from multiple IoMT devices and UAVs. This would involve optimizing the system to handle high-volume data transmission and analysis, while maintaining system security and efficiency. Additionally, real-time analysis of the collected data could be another area of focus. By enabling real-time analysis of patient data, healthcare providers could receive instant alerts of critical patient conditions and take immediate action. Another potential direction is exploring the use of blockchain technology to enhance system security and reliability. Blockchain technology could be used to create a decentralized and tamper-proof ledger of patient data, which could enhance privacy and security while enabling secure data sharing and collaboration among different healthcare providers. Finally, exploring the integration of other emerging technologies, such as edge computing, artificial intelligence, and robotics, could further enhance the capabilities of IoMT and UAV systems, enabling them to provide more personalized and efficient healthcare services to patients.

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