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Improving security management in a multimedia environment using neuro-fuzzy controller

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ABSTRACT
The increase in the rate of threats observed in the multimedia company has led to the decline of number of subscribers this company has. Meanwhile, this frequent threats noticed in this company is outwitted by introducingimproving security management in a multimedia environment using neuro-fuzzy controller. To achieve this, it is done in this manner,characterizing types of threats observed in multimedia,designing a multimedia rule base that will detect and reduce threats in multimedia,training ANN in the multimedia rule base to enhance the efficacy of the rules and designing a SIMULINK model forimproving security management in a multimedia environment using Neuro-fuzzy controller. The results obtained are the highest conventional percentage of threat is 83% while that when Neuro-fuzzy is incorporated in the system is 81.18%. With these results obtained, it shows that the percentage reduction in the number of threats when Neuro- fuzzy is incorporated in the system is 1.82%..

KEYWORDS: Improving, Security, Management, Multimedia, Neuro-fuzzy controller

I. INTRODUCTION

Security of information infrastructures, both in public or private sectors, is vital to the overall national security goals. Such infrastructures provide capabilities for gathering, managing, and sharing vital information among numerous organizations that can form large e-enterprises and generally interoperate in form of a federation of autonomous domains[1]. Information shared among multiple domains can come in various forms including text, audio, video and images which can increase the complexity of security and privacy management [2]. The key security challenges include integration of diverse security policies of collaborating organizations into a coherent capability for protecting information and using collaborative knowledge for detecting and responding to any emerging threats[3]. In addition, information privacy is generally an overriding concern[4]. Furthermore, a plethora of data analysis and mining tools have emerged that cyber defenders can use to extract sensitive information public and private multimedia applications and detect patterns and activities indicating potential threats to an infrastructure[5]. Thus, two key challenges to the design of multimedia-based scalable techniques for threat management and security of information infrastructures are datamining and security[6]. This research will make use of the block-chain technology to improve security management in a multimedia environment.Wireless ad hoc networks represent autonomous fully distributed systems that arewithout infrastructure [7]. Major interference occurs when multiple transmissions takeplace over links on the same or different codes, thus leading to many problems andissues such as delay, jitter, limited bandwidth, and packet loss (packet drop), etc.,which in turn affects quality of service (QoS) performance[8]. Over the last several years,wireless ad hoc networks have attracted considerable research attention in thegeneral networking and performance community [9]. Recently, multimedia applications in wireless ad

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hoc have become increasingly popular, but even to a greater degree results to challenges of delay and packet loss [10]. Low multimedia transmission quality caused by packet delay and loss of voice traffic, for instance, is still one of the critical technical barriers of the voice communication system. Due to increasing popularity of wireless ad hoc network, the QoS support for multimedia transmission has become an important requirement because it is closely related to resource allocation satisfied.[11] presented Security and privacy in cloud computing in which they analysed the key security issues that envelopes market today with safety measures, to serve server providers and enterprises in the best way possible.In the same topic,[12] presented Data privacy in cloud computing, which was a new fully homomorphic encryption scheme from integers. The encryption scheme can be used essentially to secure sensible data in cloud computing. The proposed scheme uses a large integer ring as clear text space and one key for encryption and decryption, i.e., it is a symmetric encryption scheme.To comprehend the rudiments of distributed computing and putting away information verifying on the cloud, a few assets have been counseled[13[.This area gives a survey of writing to set an establishment of talking about different information security perspectives[14]. In [15] the authors give phenomenal understanding into the fundamental ideas of distributed computing. A couple of key thoughts are explored in this paper by giving cases of usages that can be made using dispersed registering and how they can help the making scene in getting benefit by this rising development[16].

1.1 Aim of the Study

This paper is aimed at achieving improvement on Security Management in a multimedia Environment Using Neuro-Fuzzy Controller.

1.2 The Objectives of Study

To achieve this, it is done in this manner,

- Characterizing types of threats observed in multimedia,
- Designing a multimedia rule base that will detect and reduce threats in multimedia,
- Training ANN in the multimedia rule base to enhance the efficacy of the rules,
- Designing a SIMULINK model for improving security management in a multimedia environment using Neuro-fuzzy controller.

II. METHODOLOGY

The methodology for this work is the step-by-step adherence to the objectives of the study; this has to do with the measurement of the collected data of the threat levels and types, using the chronological data base of the company.

It starts with characterizingthe types of threats observed in multimedia, designing a multimedia rule base that will detect and reduce threats in the system, training Artificial Neural Network (ANN) in the multimedia rule base to enhance the efficacy of the rules designing a SIMULINK model forimproving security management in a multimedia environment using Neuro-fuzzy controller.

2.1 Characterizing the types of threats observed in multimedia

Table: 1 Characterized threats in a Multimedia environment

Types of threats in multimedia	% of threats in multimedia network	Time of threat	Date of threat	Days of threat
Copy right	80%	1pm	6/11/2018	1
Hacking in to ones data or data leakage	82%	2am	7/8/2019	2
Explotation of internateconection	70%	3pm	8/6/2019	3
Corruption of data	60%	1am	4/4/2019	4
Bonnets	60%	7am	5/10/2018	5
Distributed denial-of-service (ddos)	75%	4PM	6/6/2018	6
Malware	83%	2AM	7/10/2019	7

2.2 Designing a multimedia rule base that will detect and reduce threats in multimedia

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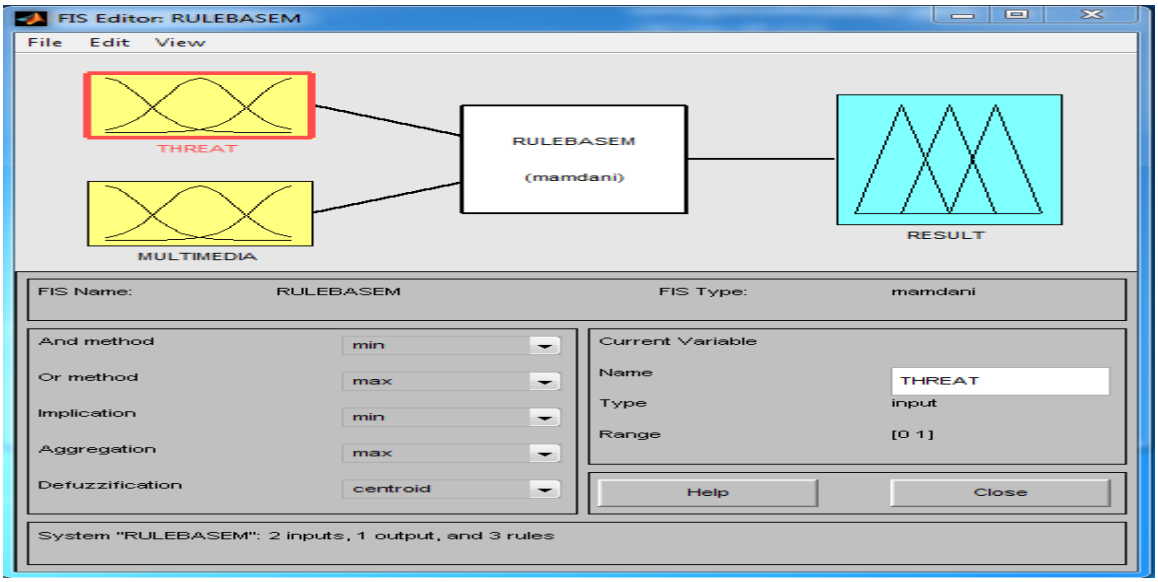

Fig 1 designed multimedia Fuzzy inference system that will detect and reduce threats in multimedia

Fig 1 shows designed multimedia Fuzzy inference system that will detect and reduce threats in multimedia. Fig 1 has two inputs of threats and multimedia and an output of result.

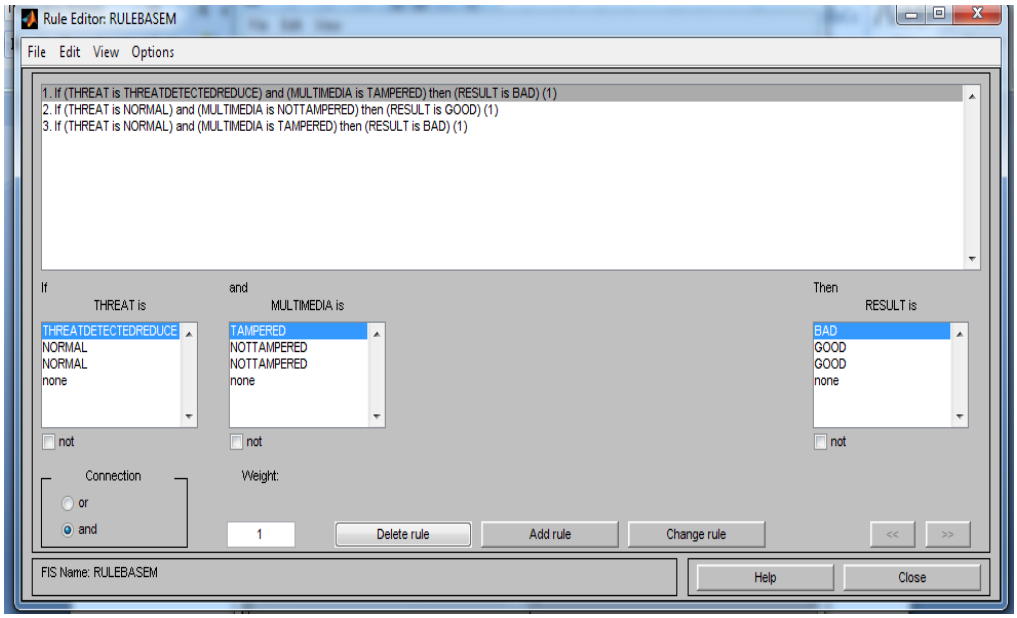

Fig 2 designed multimedia rule base that will detect and reduce threats in multimedia

Fig 2 shows designed multimedia rule base that will detect and reduce threats in multimedia. The rules are three in number as shown in fig 2.

2.3 Training ANN in the multimedia rule base to enhance the efficacy of the rules

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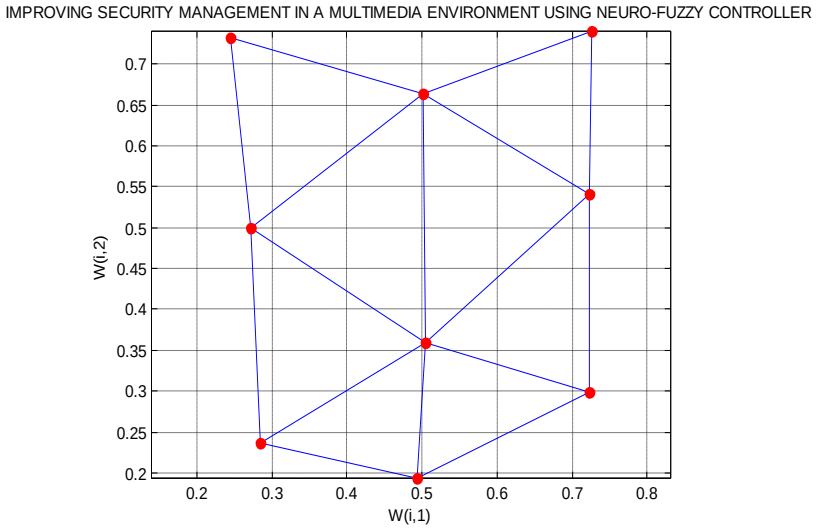

Fig 3 trained ANN in the multimedia rule base to enhance the efficacy of the rules

Fig 3 shows trained ANN in the multimedia rule base to enhance the efficacy of the rules.

2.4 Designing a SIMULINK model for improving security management in a multimedia environment using Neuro-fuzzy controller

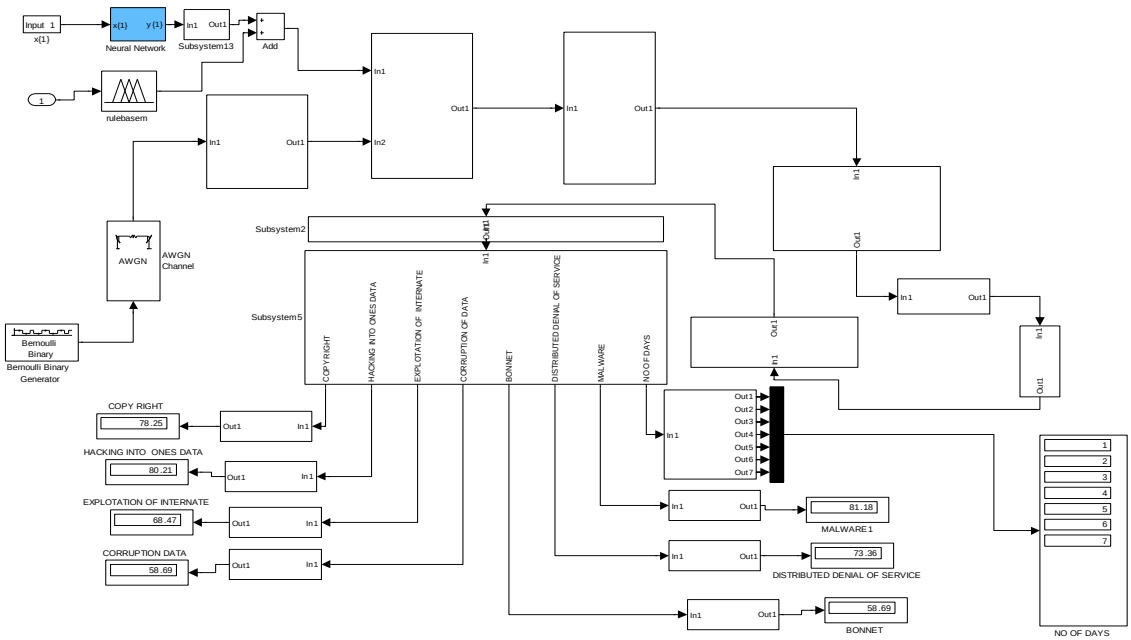

Fig 4designed SIMULINK model forimproving security management in a multimedia environment using Neuro-fuzzy controller.

Fig 4 shows designed SIMULINK model forimproving security management in a multimedia environment using Neuro-fuzzy controller. The results obtained after simulation are as shown in fig 5.

III. RESULTS AND DISCUSSION

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Fig 1 shows the designed multimedia Fuzzy inference system that will detect and reduce threats in multimedia. Fig 1 has two inputs of threats and multimedia and an output of result.
Fig 2 shows designed multimedia rule base that will detect and reduce threats in multimedia. The rules are three in number as shown in the figure.
Fig 3 shows trained ANN in the multimedia rule base to enhance the efficacy of the rules.
Fig 4 is the designed SIMULINK model forimproving security management in a multimedia environment using Neuro-fuzzy controller. The results obtained after simulation are as shown in fig 5. Fig 5 shows comparison between conventional threat and Neuro-fuzzy threat in improving security management in a multimedia environment. The highest conventional percentage of threat is 83% while that when Neuro-fuzzy is incorporated in the system is 81.18%. With these results obtained, it shows that the percentage reduction in the number of threats when Neuro- fuzzy is incorporated in the system is 1.82%.Table 1shows the characterized types of threats observed in multimedia; while Table 2compares the conventional threat and Neuro-fuzzy threat in improving security management in a multimedia environment.

Table:2comparison between the conventional threat and Neuro-fuzzy threat in improving security management in a multimedia environment

Time (s)	Conventional threat in improving security management in a multimedia environment	Neuro –fuzzy threat in improving security management in a multimedia environment
1	83	81.18
2	75	73.36
3	60	58.6
4	80	78.25
5	82	80.21
6	70	68.47
7	60	58.69

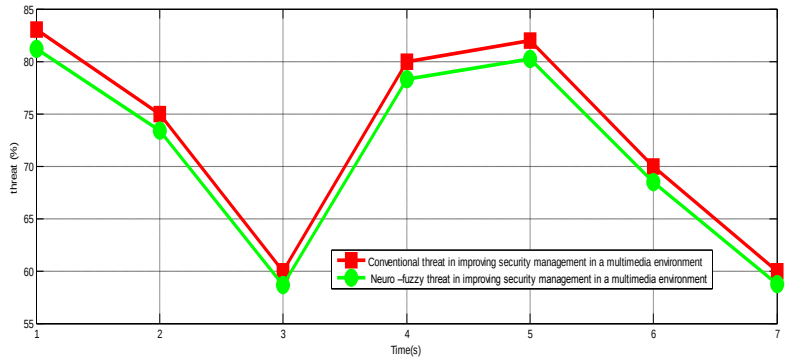

Fig 5 comparing conventional threat and Neuro-fuzzy threat in improving security management in a multimedia environment. Fig 5 shows comparing conventional threat and Neuro-fuzzy threat in improving security management in a multimedia environment. The highest conventional percentage of threat is 83% while that when Neuro-fuzzy is incorporated in the system is 81.18%. With these results obtained, it shows that the percentage reduction in the number of threats when Neuro- fuzzy is incorporated in the system is 1.82%.

IV. CONCLUSION

The high rate of increase in the number of threats experienced in multimedia has led to its reduction in the number of its subscribers. This number of threats observed in the multimedia that has drastically led to the reduction of its subscribers is eradicated by an introduction of improving security management in a multimedia environment using neuro-fuzzy controller. To achieve this, it is done in this manner, characterizing types of threats observed in multimedia, designing a multimedia rule base that will detect and reduce threats in multimedia, training ANN in the multimedia rule base to enhance the efficacy of the rules and designing a SIMULINK model forimproving security

management in a multimedia environment using Neuro-fuzzy controller. The results obtained are the highest conventional percentage of threat is 83% while that when Neuro-fuzzy is incorporated in the system is 81.18%. With these results obtained, it shows that the percentage reduction in the number of threats when Neuro- fuzzy is incorporated in the system is 1.82%..

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