American Journal of Engineering Research (AJER)
e-ISSN: 2320-0847 p-ISSN : 2320-0936
Volume-11, Issue-01, pp-194-199
www.ajer.org
Research Paper Open Access

Improving Against Cyber-attack by Hackers in our Tertiary institutions: Artificial Intelligence Approach

[1]Bakare Kazeem, *Department of Electrical and Electronic Engineering, Enugu State University of Science and Technology, (ESUT), Nigeria*
[2]Ngang Bassey Ngang, *Department of Electronics and ComputerEngineering, Veritas University, Abuja, Nigeria.*

ABSTRACT :
The rate at which hackers have devised means of increasing threats is becoming unbearable. Classified information is no longer confidential in financial institutions and academic environments. Government agencies and election organizers are no exception in these nefarious activities. The resultant effect is a decline in the number of subscribers that patronize the affected telecommunication companies. The threats could be minimized or prevented by introducing a smart means of checking to eliminate the threats to improve the security management in the higher institution or multimedia environment using intelligent agents. The methodology used to understand the nature of threats and types of threats observed in multimedia could be outlined as follows: Designing a smart rule base that will detect and reduce threats in multimedia, training Artificial Neural Network (ANN) in the multimedia rule base to increase the efficiency of the rules. The next stage is to design a SIMULINK model for improving security management in the higher institution using Artificial Intelligence (Neuro-fuzzy software). The results obtained are highest without Neuro-Fuzzy Controller with percentage threat level recorded as is 83% while that when Neuro-fuzzy is incorporated in the system is 81.18%. This clearly shows that there is an obvious percentage reduction in the number of threats when Neuro-fuzzy is incorporated into the system. The positive performance index was 1.82%.
KEYWORDS *Improving, Cyber-attack, Hackers, Artificial Intelligence, Tertiary Institutions.*

Date of Submission: 16-01-2022 Date of acceptance: 31-01-2022

I. INTRODUCTION

Information security system, in the public or private sector, is of paramount importance to all national security objectives. Such institutions provide the ability to collect, manage, and share valuable information between multiple organizations that can build large e-commerce businesses and often participate in private domain relationships [1]. Information shared between multiple domains can come in a variety of forms including text, audio, video, and images that can increase the complexity of security and privacy management [2]. Major security challenges include the integration of various security policies of cooperating organizations in collaborative efforts to protect information and use shared information to detect and respond to any emerging threats [3]. In addition, confidentiality of data is often a major problem [4]. In addition, some data analysts and mining tools have suggested that cybercriminals can use it to extract sensitive information from a private and confidential multimedia system and detect patterns and functions that reflect potential threats to infrastructure [5]. Thus, two key challenges in the development of multimedia-based flexibility strategies for managing threats and data mining and information security [6]. This study will use blockchain technology to improve security management in the multimedia environment. Wireless ad networks represent live streaming systems that are fully distributed without infrastructure [7]. Significant disruption occurs when multiple transfers occur with links to the same or different codes, thus leading to additional problems and issues such as delay, jitter, limited bandwidth, packet loss (packet loss), etc., which also affects service level (QoS) [8].Over the past few years, wireless networks have attracted a lot of research across the network and social functioning [9]. Recently, multimedia programs on ad hoc wireless have become increasingly common, but even largely the effects of delays and packet loss challenges [10]. Low multimedia transmission quality caused by packet delay and loss of voice traffic, for example, is still one of the major technical barriers to the voice communication system. Due to

the growing popularity of wireless ad networks, QoS support for multimedia transmission has become an important requirement because it is closely related to service satisfaction. [11] Introducing Security and Privacy in the computer cloud where he analyzed the key security issues enveloped the market today with security measures, in order to provide the server and business providers with the best possible solution. In the same article, [12] introduced Data Privacy on cloud computing, which was a relatively new homomorphic encryption system based on numbers. The encryption system can be used primarily to protect logical data from a cloud computing. The proposed system uses a clear text space ring and a single encryption key to remove encryption, that is, a standard encryption system. In order to understand the basics of distributed computerization and to distance information from the cloud, a number of assets have been advised [13 [. In [15] the authors provide a comprehensive insight into the basic concepts of distributed computation [16]. of threats identified in our area, Designing a smart legal framework that will detect and reduce threats to multimedia, training ANN in the legal framework designed to improve format efficiency, design a SIMULINK model for **enhancing** security optimization in a multimedia environment using Neuro-fuzzy controller. Many tools are now in use for improving the performance of the power electronics in the industry to enhance increased productivity; some of these are, artificial intelligence, fuzzy logic, neural networks, hybrid networks, etc [17]. They have been recently recognized as the important tools to improve the output performance of machines in the industrial sectors. Utilization of these intelligent control with adaptiveness seems to yield a promising research area in the development, implementation, and control of electrical drives.In the study conducted by [18], he affirmed that fuzzy controller is an effective means of regulating system frequency; when combined alongside other control devices would yield good results; hence being used for complementary functions with Artificial neural network (ANN) our design would be effective and efficient. The work done in [19] does recommend that for any successful design the methodology involved in the work must be followed step-by-step and adhered to the specific objectives of the study; which has to do with the measurement of the collected data, classification, and tabulation.Investment that will pay considerable dividends over the course of its operating life is a comprehensive power monitoring system. Even though increased energy prices have become a larger influence on the balance sheet, many facilities do not take advantage of opportunities to better manage these expenses. Those without monitoring systems likely have no understanding of their energy usage; those with them may not be using their systems to the fullest potential.

Because the quality of energy supplied can adversely affect its operation, oftentimes leading to loss or degradation of equipment, product, revenue, and reputation, plant managers must weigh the advantages of implementing a monitoring program.

The second section of this paper shows three methods for monitoring systems of solar plants. The third section discusses communication and monitoring system for wind turbines, and finally the conclusion is discussed in the fourth section.

II. METHODOLOGY

The procedure adopted in achieving the goal of this task is the step-by-step approach to the specific objectives of the work; this entails collecting and weighing the threat levels using trending method; classifying the threats and types, using the time series method approach from the service provider's records in the database of the company.

This involves characterizing the types of threats observed in the affected area, designing a rule base that will detect and minimize threats in the multimedia environment, training Artificial Neural Network (ANN) in the multimedia rule base to enhance the efficiency of the stated rules; finally designing a SIMULINK model for improving the security system in a multimedia environment using Neuro-Fuzzy approach. Multimedia is simply multiple forms of media integrated together. An example of multimedia is a web page with animation. The basic types can be described as follows: Text, Graphics, Audio, Animation, Video, and Graphics Objects (see: Computer graphics and visualization, etc. The threats can come from any source and has to be reported.

ii

2.1 Classifying 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 internate conection	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

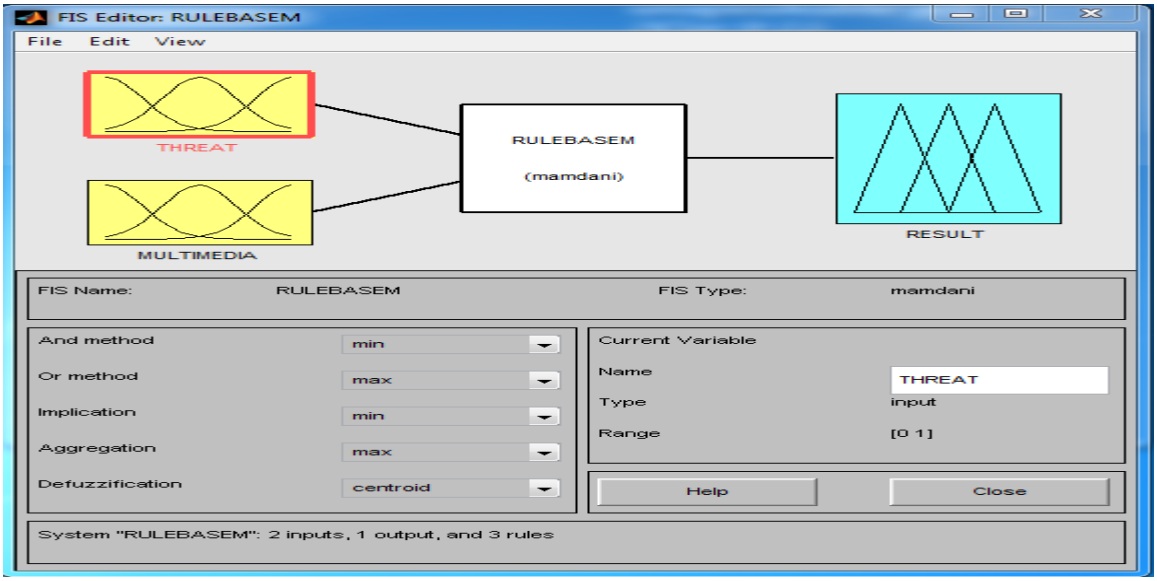

Fig 1 designed multimedia Fuzzy inference system that will detect and reduce threats in multimedia

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

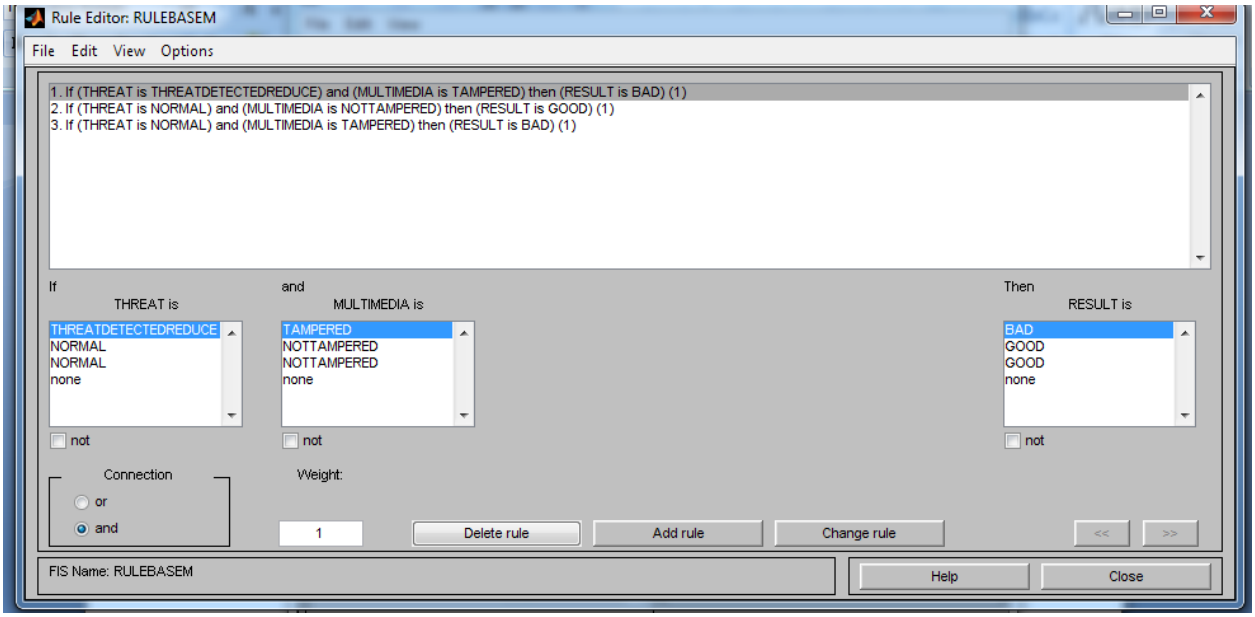

Fig 2 designed multimedia rule base that will detect and reduce threats in multimedia

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

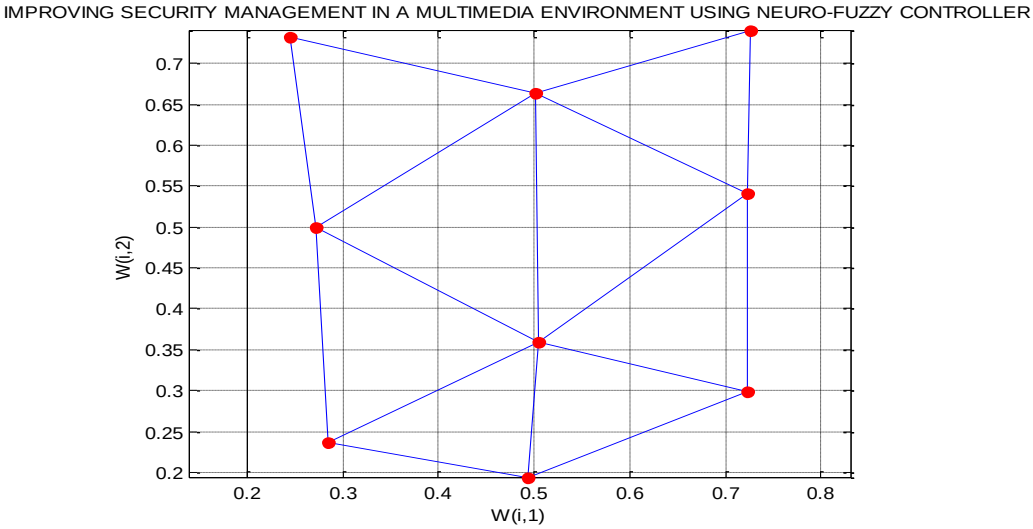

Fig 3 trained ANN in the multimedia rule base to enhance the efficacy of the rules

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

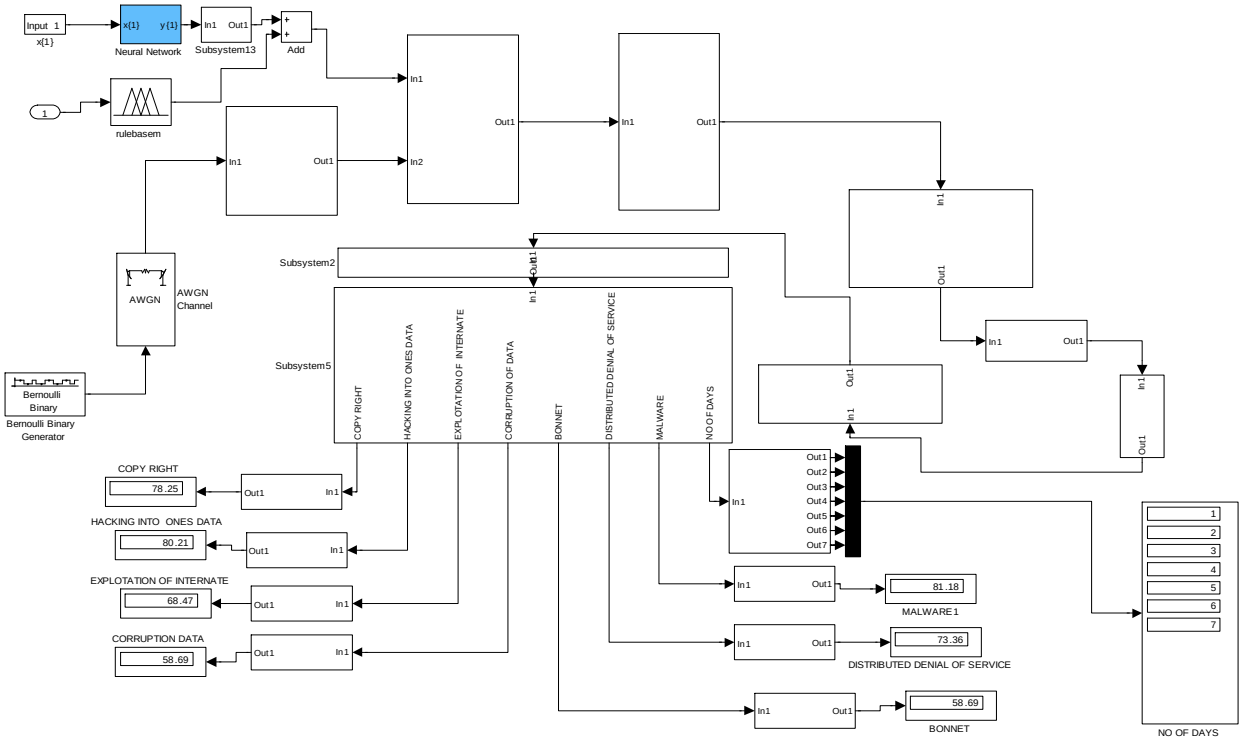

Fig 4 designed SIMULINK model forimproving security management in a multimedia environment using Neuro-fuzzy controller.

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

Figure 1 shows a multimedia designed using Fuzzy Inference System that can detect and reduce threats in multimedia. Figure 1 has both threats and multimedia as inputs and the result as output.

Figure 2 shows the basics of multimedia rule designed to detect and reduce threats in multimedia. Three rules are involved as displayed in figure 3. It shows ANN trained in the basics of multimedia rule to improve the efficiency of the rules.

Figure 4 is a SIMULINK designed model for enhancing security management in a multimedia environment using Neuro-fuzzy control. The results obtained after simulation are as shown in Figure 5. Figure 5 shows a comparison between a common threat and a Neuro-fuzzy threat in improving security management in a multimedia environment. The average prevalence rate is 83% without a controller, when the controller is included in the system we have 81.18%. With these results obtained, it shows that the percentage reduction in the number of threats when Neuro-fuzzy is introduced into the system is 1.82%. Table 1 shows the types of threats found in the multimedia; while Table 2 compares the common threat and the Neuro-fuzzy threat to improving security management in a multimedia environment.

Table: 2 comparison 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

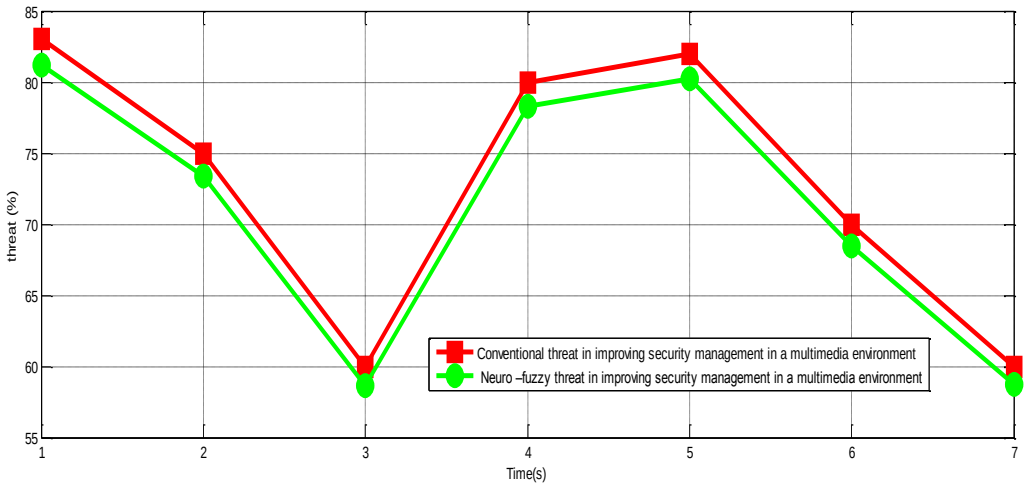

Fig 5 comparing conventional threat and Neuro-fuzzy threat in improving security management in a multimedia environment. Fig 5 shows comparing conventional threat and Neuro-fuzzy threat in improving security management

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%..

REFERENCES

[1]. Hasib,M. and Schormans,A.(2018). Limitations of passive & active measurement methods in packet networks, Proc. LCS.London Communications Symp.

[2]. D'Antonio,D.Esposito,M. and Gargiulo,M.(2019). A Component based approach to SLA monitoring in premium IP networks', First Int. Workshop on Inter domain Performance and Simulation

[3]. Al-Sbou,Y., Saatchi, R. and Strachan, R.(2017). Estimation of the distributions of the QoS parameters using sampled passive measurements techniques, Proc. Second Int. Conf. e-Business and Telecommunication Networks (ICETE), Reading, UK, pp. 3–7.

[4]. Nedeljkovic,.I(.2020) Image classification based on fuzzy logic, in Proc. Geo-Imagery Bridging Continents ISPRS Congr., pp. 83–88, Istanbul, Turkey.

[5]. Oliveira,R and Braum, T.,(2014).A fuzzy logic engine to assist TCP error detection in wireless mobile ad hoc networks, Next Generation Wired/Wireless Advanced Networking, Int. J. Comp. Intel. Appl.

[6]. Urathal,U and Chandrasekar,C ,(2012).An efficient fuzzy based congestion control technique for wireless sensor networks, Int. J. Comput. Appl. 40(14) (2012) 47–56.

[7]. Anthony Lordson Amana,Uko Ofe, Ngang Bassey(2021).Enhancement of Data Network Robustness in Nigeria, Using Adaptive Modulation Technique. International Journal of Advances In Engineering and Management(IJAEM),Vol. 3 Issue 6

[8]. Ngang. B.N. Anthony.L.A.and Uko, O.(2021).Intelligent Agent Based–Real Time monitoring and Evaluation of GSM Quality of Service. Journal of Information and Knowledge (JIKM), IISTE

[9]. Umoh,A and Udosen,A.,(2014). Sugeno-type fuzzy inference model for stock price prediction, Int. J. Comput. Appl. 103(3) (2014) 1–12.

[10]. Mohammed,E.,Brahim.R. and B. Mostafa,B.,(2018). Fuzzy logic for QoS control in IMS network, Int. J. Comput. Appl. 28(9), 39–46.

[11]. Shrivastava,S.,Bhilare,D., andThakur,R.(2013). Improving QoS and service level agreement of mobile application at transport layer using fuzzy logic mapping, Int. J. Adv. Res. Computer Sci. Softw. Eng. 3(11) 77–84.

[12]. Asuquo,D. and Umoh,U. (2015).Analytic hierarchy process for QoS evaluation of mobile data Networks, Int. J. Comput. Netw. Commun. 7(6)

[13]. Abbasi, R.,Bidgoli,A. and Abbasi,M.(2012). A new fuzzy algorithm for improving quality of service in real time wireless sensor networks, Int. J. Advanced Smart Sensor Netwrk. System. 2(2), 1–14.

[14]. Zarei,M., Rahmani, A, and Teshnehlab,M.(2019). Fuzzy based trust estimation for congestion control in wireless sensor networks, Int. Conf. Intelligent Networking and Collaborative Systems.

[15]. Bazaz1, Y.,Kumar,S. and Anand,S.(2012). Congestion control mechanism using fuzzy logic, Int. J. Emerging Trends Technol. Comput. Sci. 2(2), 313–319.

[16]. Ugwu,K.I.et al.Modeling of Alternating Current Motor Performance for Increased Production Using Fuzzy Logic Controller. *International Journal of Electrical Components and Energy Conversion*. Vol. 7, No. 1, 2021, pp. 17-22. doi: 10.11648/j.ijecec.20210701

[17]. Bakare, K., Ngang, N.B., Improving Frequency Stability of the Nigerian 330kv Transmission Network Using Fuzzy Controller. *American Journal of Electrical Power and Energy Systems*. Vol. 10, No. 3, 2021, pp. 43-50. doi: 10.11648/j.epes.20211003.1

[18]. Onuba, C., et al., Energy Efficiency Improvement of Doubly Fed Induction Generator Machines using Adaptive Control Technique. International Journal of Advances in Engineering and Management (IJAEM) Volume 3, Issue 7 July 2021