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Application of artificial intelligence in controlling electrical automation

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ABSTRACT

With the new development of IT, it has been accepted and recognized in all over the world that artificial intelligence AI is one of the most adorable and powerful ideology and concept to change all the aspects of the world in current era. Now a day's all the processes of human beings are being transferred to digitized methodology such as data acquisition, computer infrastructure and machine learning. AI is getting more and more development and expending towards those areas that were thought be reserved only for human beings, where machine has nothing to do with this, due to its complexity. But currently these all areas are being filled by the concept of AI. As being said AI expending to different areas, similarly it is being reached out to the electrical field. Electrical equipment's and AI has enough connection in today world. Electrical equipment's and electricity is as complex as doing by only human beings, but if it is compared by implementing AIelectrical control is so easy and simple to do. AI applications are capturing different sectors among them one is electrical automationcontrol. AI has extreme power and spectacular potential to enhance automation of electrical equipment's and its methodology and modernized the electrical processes of electricity. In electricityAI has investigated for different benefits such as identification of normal and abnormal structure. It also covers the issues of equipment's in electricity and its future predication of its future installment. In the past what looks science fiction is now converted to reality particularly in controlling electrical automation. Artificial intelligence (AI) is so fast developing technology that empowers machines to perform different tasks which were previously totally depending on humans. Improvement in AI offers enormous benefits in controlling electrical automation such as improving quality of life, empowering decision-making, minimize postoperative complications and removing all the extra procedures when implemented to thefield of electricity as well in controlling electrical automation. According to the research AI has and will have the most strong and acceptable role in controlling all electrical automation. It is being strongly witnessed without AIelectrical field is totally in risk to fulfill all the challenging and complexstructure of electrical equipment's. The main difference between human work and work done by AI is its speed, accuracy, erasing complexity and providing future predication about the work which is being under execution.

I. INTRODUCTION

Artificial intelligence (AI) is enriching sector of technology, its applications are also expending with the passage of time. The world got complete realization and acceptance of AI to be used in controlling electrical automation to empower its broad specification, accuracy, detection of errors and future outcomes. Every field tries to use AI as their priority to gain all the information and processes under a systematic methodology. With large documentation of controlling electrical automationand data that is required of the time to use AIsoftware to process and save this data. From the start to end all the history of thecontrolling electrical automationand related data are being processed and then exact data would be extract from the history of controlling electrical automationto determine prime issues that CEA has (Feng Jin, 2014). Artificial intelligence has enormous applications in controlling electrical automation.AI is so swift emerging technology that authorizes machines to perform distinguishes tasks which were previously totally depending on humans. Improvement in AI offers enormous benefits in controlling electrical automationsuch as improving quality of life, empowering decision-making, minimize postoperative complications and removing all the extra procedures when implemented to the field of controlling electrical automation. According to the researchers and experts AI has and

will have the most strapping and acceptable role in controlling electrical automation. To truly explain all the aspects of AI in controlling electrical automationare improving with the passage of time. But robotic system is still out of reach, there are some components of AI known as software-type algorithm. It is the most powerful and emerging component in controlling electrical automationbecause of its strong abilities in data analysis. All virtual algorithms use in controlling electrical automation.These virtual algorithms are expected to improve the accuracy and efficiency of controlling electrical automation analysis because of their powerful data analysis capabilities. They will also provide visualised anatomic guidance for installation, simulate and evaluate prospective results, and project the occurrence and prognosis of oral equipment. In today's algorithms, there are a number of potential roadblocks that might limit normal adoption of artificial intelligence (AI), such as a lack of centralised data curation, sharing, and readability, as well as an inability to depict the decision-making process inside (Zhongxiong, 2017). To transform the practise of regulating electrical automation, it is vital to retain a proactive approach toward AI and foster human-technology rapport.

1. The currentaspect of artificial intelligence in controlling electrical automation

Currently artificial intelligence AI is being using extremely effectively in controlling electricalautomationsector. All the data and congested installment and non-congestedinstallmentare done by using some outstanding algorithms of AI by which the data is always accurate and systematic. According to the present research AI and electricity has deep relation and joint execution to fulfill all the requirements and demands of today's raised problems. The current technology of pictures diagnostics, oral imagestechnologies, digital photography are some of the most appreciable aspects of AI.Artificial intelligence (AI) is so fast developing technology that empowers machines to perform different tasks which were previously totally depending on humans(Kaibao, 2007). Improvement in AI offers enormous benefits in controlling electrical automationsuch as improving quality of life, empowering decision-making, minimize postoperative complications and removing all the extra procedures when implemented to the field of controlling electrical automation. The present ideology of controlling electrical automationis totally relying on AI. The main objective of AI is the classification of complex data which is tough to be classified by manual method, but by suing deep learning algorithm it is so simple and excellent in terms of work such as classification of images without human involvement.

2. Advantages of AI (Using AI for Electrical Automation Control Has Many Advantages)

(1) Simple design *idea*: Without the concept of AI the idea and design of electrical automation is so complex and congested to be design accordingly. The conventional classification of controlling generally needs to be design accordingly to the control object, thus AI is not so difficult to be used alongwith its functions.
(2) *Work enrichment*: by adopting systematic adjustment of related parameters, performances can be developed sharply, such as fuzzy controller which responds faster than optimal PID.
(3) *Much suitable to be used*: according to the research AI is much easy in terms of controlling than the controlling of classical controller. This is why it is always given priority to the AI controller.
(4) *Good consistency*. As a result of the old control method being tailored to each individual item, the control effect is excellent just for that one particular object, but the effect of other control objects will be inconsistency. Regardless of whether the input data is known or unknown, the AI control technique can achieve acceptable consistency estimate.

3. The upcoming of artificial intelligence in controlling electrical automation

The upcomingofcontrolling electrical automationis and will entirely relying on AI, because the world all sectors are getting modernizing and developing more reliable and acceptable method and techniques for the future. Similarly controlling electrical automationsector is also promoting its set up towards the better and machine based procedures.Regardless of advancement in controlling electrical automationmodalities, no outstanding development had made in the procedure for diagnosing and pre-determining the prognosis of controlling electrical automation.There are some components of AI known as software-type algorithm. It is the most powerful and emerging component in controlling electrical automation because of its strong abilities in data analysis. All virtual algorithms use in controlling electrical automation, Because of their powerful capabilities in data analysis. It is the future vision of AI to find a solution for this kind of problem and generate a solution which is reliable in all angles(nai-xingwei, 2007). The data processing

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time is more consuming as the researchers had stated, it needs to be very swift and in detailed.

4. Applicationsof artificial intelligence in controlling electrical automation

I. *Simplifying the process*

As it is been clearly stated that mostly electricity / electricalautomation is so complex and needs enough procedures to accomplish the whole system successful in the past it was a headache and bag of faults to be done all the processes in one click, and the system would have all the diagnosis which was tough to be classified and prepared on the spot. When the idea of AI came to being, the complexity had been converted to simplicity and the conventional methodology is totally changed to digitized methodology. The main advantage of this process is to minimize the time and swift respond attime(Miss Ann, 2013). The entire procedure can be classified into the following, such as.

- Fault situation
- Environmental detection
- Equipment repairing

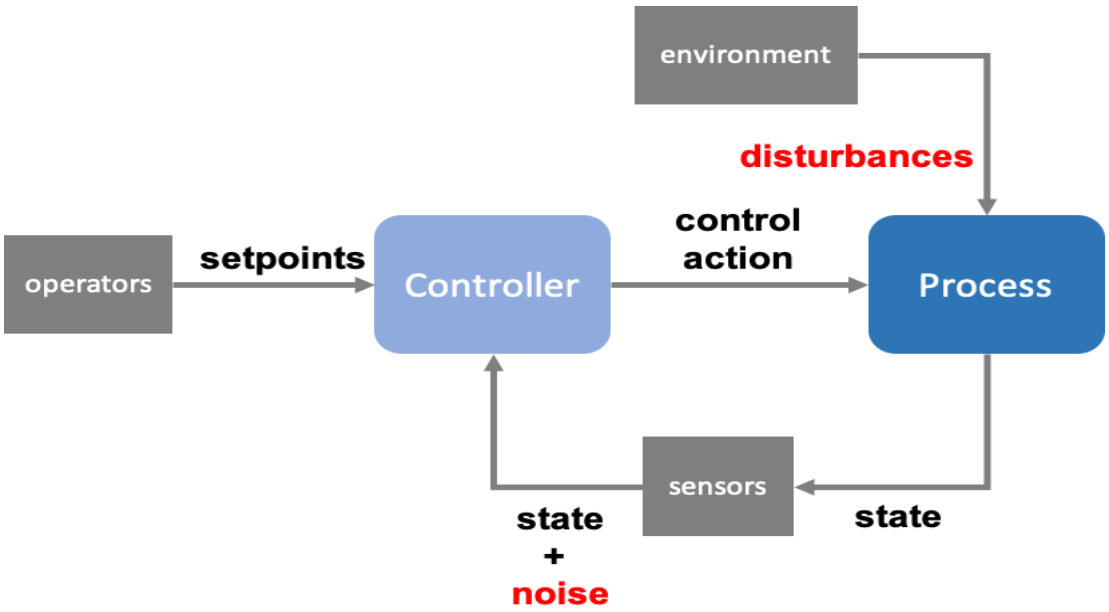

Figure 1: simplifying the process

II. *Fault diagnosis*

As it was explained and stated before, AI is so powerful and holding a systematic methodology, by which all tough troubleshooting can be done easy and simply. Particularly in electrical field there are so many congested circumstances in conventional which cannot be supported. According to the research AI is the need and compulsoryoption for today controlling electrical automation. There are so many ways by which the equipment's of electricity can be caused and it needs so rapid and swift respond to be fixed, if these issues are not dealt timely and comprehensively this may cause bigger sub-issues in the future and may damage all the functional entities of the system. There are two methods to detect the diagnoses such as fuzzy theory and neural network. If further methodology is implementing it will further shorter the time of detecting the issues in the system (Uraikul, 2007). These all processes can only be done by implanting the concept of AI. Such failures are the following.

- Earthquakes
- Tsunamis
- Typhoons
- Humidity
- In-proper operation

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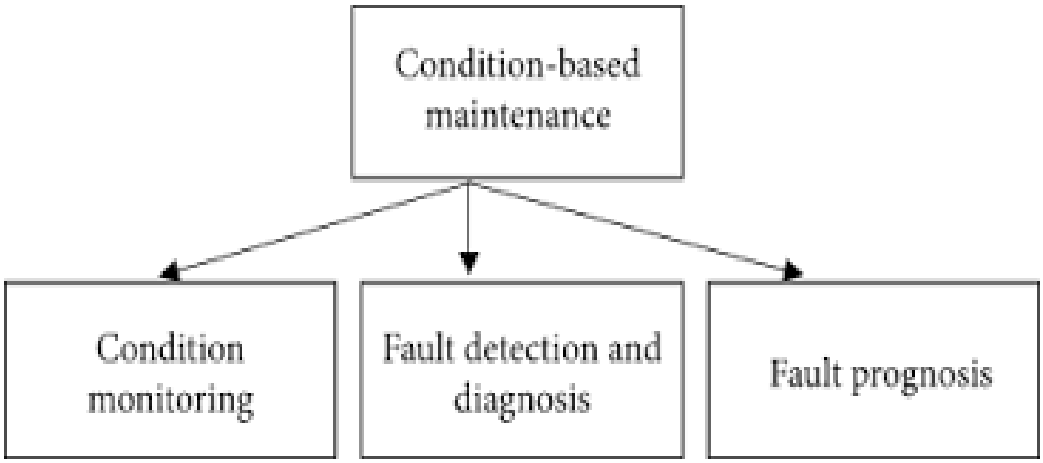

Figure 2: fault diagnosis

III. ***Electrical control***

The main objective of AI in controlling electrical automation is the control of over all performances in electrical field. In the past it was tough and complex to handle all the issues in controlling electrical automation. Once the idea and concept of AI came to being, electrical processes are being just touch and go. The electrical automation process is connected mostly through electrical control. It not only determines the technique, but it can also manage the pace and efficacy of the electrical automation process in terms of production. After the advent of electrical control automation AI technologies. The electrical automation idea reached out more scientifically (Goldberg, 1988). Furthermore the operations in controlling process had become more efficientand strengthen the reliable of equipment's had greatly improved. In-addition, As a result of AI technology, electrical control operations and production costs are more efficiently and scientifically controlled in the process of electrical control.

IV. ***Fuzzy control***

Fuzzy control is a methodology by which we can detect the complex confused situation easy and timely, it is a theoretical main linguistic variable and is used for fuzzy reasoning. Fuzzy control, according to experts, is a control system that uses the controller as its principal piece of equipment. It's a closed loop with a quick feedback mechanism or a channel. The logic and reasoning structure for fuzzy control is the system which is totally depending on the fuzzy logic (AKC Wong, 2003). This connects the digital computer system alongwith the control system. It is one of the most powerful and effective methodology by which different sort of issues can be solved. Below is the diagram which shows the fuzzy diagnosis of the fuzzy control.

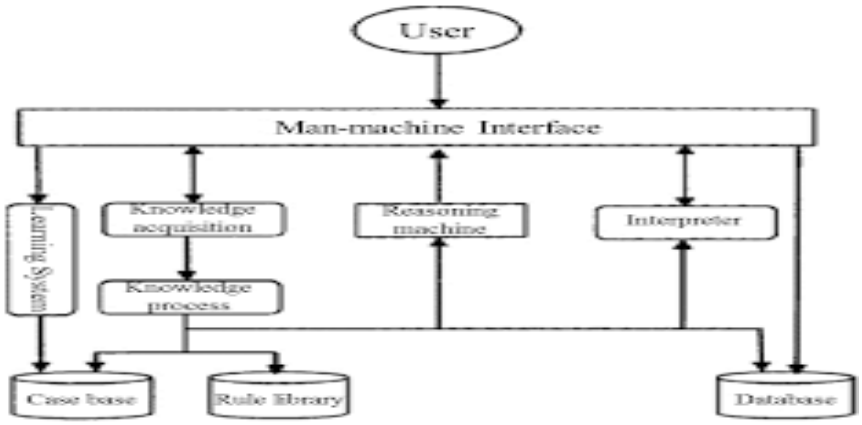

Figure 3: electrical control

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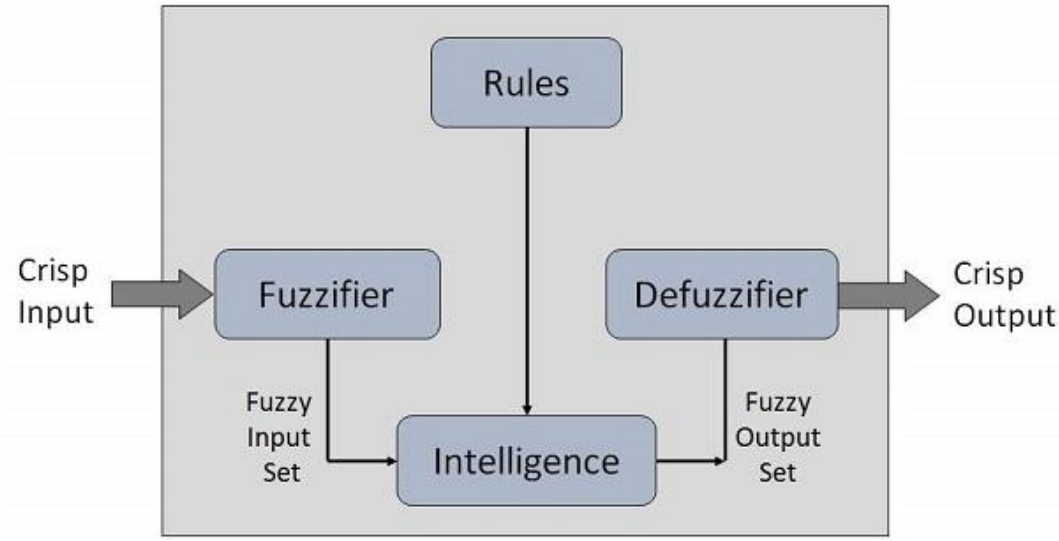

Figure 4: Fuzzy control

V. ***Expert control (*EC)**

Expert control is totally depending on the theoretical and practical experiences of the expert in related fields. While controlling the electrical automation it requires the expertise of the person to be relevant and having knowledge of electrical controlling system. Honestly speaking it points to experience to hold the control process.

EC technology has enough benefits such as flexibility and adjustability thus control technology has the most outstanding advantages over the normal and conventional concepts and processes. During the execution of process the controller parameters are being tested in distinguish circumstances (Bakshi, 1994). Furthermore, the level of control is quite great, making its application seem bizarre. Third, the safety and stability of EC technology equipment can be applied to many various designs of controllers. An in-depth contemplation is required for a qualitative analysis, as well as being safe and conservative.

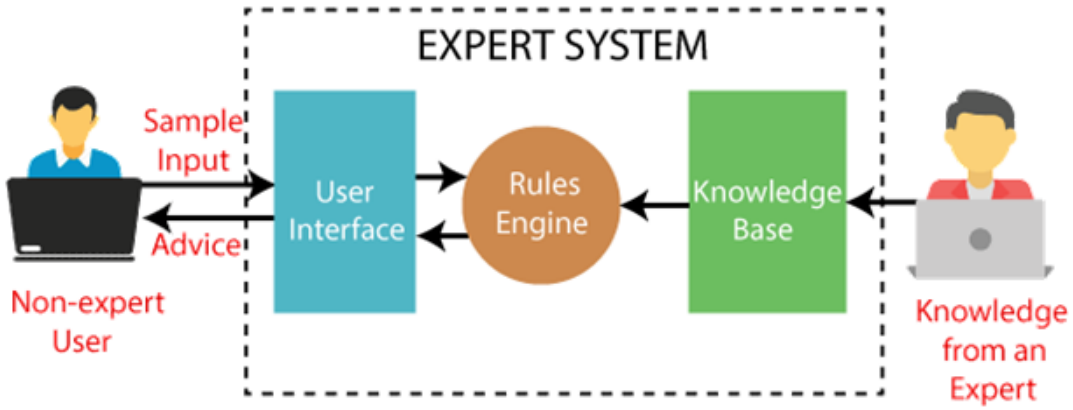

Figure 5: Expert control

Network Neural Control

The theoretical basis of network neural control is the activity of human brain neurons, and the rules of human brain neurons provide a basic model for network neural control. Nowadays, there are many scholars in the field of network neural control, so the development speed of network neural control is very fast, and many achievements have been made. The research of network neural control develops very fast, which brings great good news to the application of electrical automation control. In order to providereaders with a deeper understanding of network neural control, this paper takes fuzzy control as an example to discuss. Specifically, the

function of fuzzy control is mainly realized on the basis of DC and AC drive. In the process of DC transmission, its transmission control is Mamdani and Sueno, the former expresses speed control, the latter expresses trigger control. In the process of AC drive, the automatic control needs to be based on the fuzzy controller. Figure 4 below is a schematic diagram of the fuzzycontrolle

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(4) Electrical Equipment

VI. ***Network Neural Control***

According to new development enough consideration is been paid to neural network in AI because it is the brain of neurons just like human beings. Many achievements had done by using the idea of neural network in controlling electrical automation, as being said neural network had brought great amendment in the applications of electrical automation. In order to provide the best platform for the users and manufacturer the depth understanding in electrical automation the best option would be neural network, fuzzy control is an example of neural network which can be discussed. Fuzzy control's primary function relies on DC and AC circuits.(Hassoun, 1996).

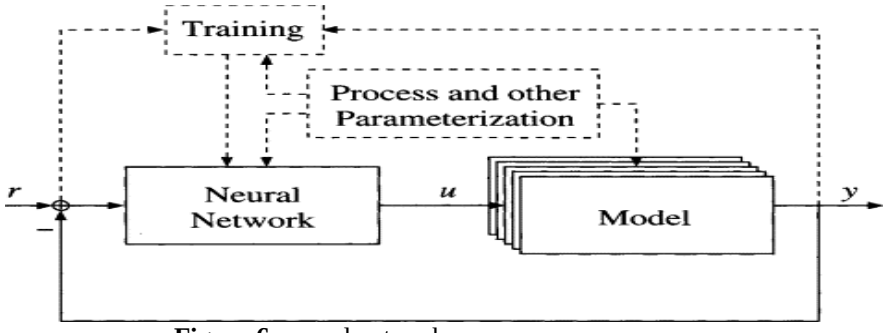

Figure 6: neural network

II. DISCUSSION

To thrash out the courageous ideas of artificial intelligence in controlling electrical automation is its reliability, speed, accuracy, erasing more complexity and management of data. The most tough and thinkable point for today electrical manufacturing members is the equipments care after or before the installment is being processed. In most of the cases the electrical designing members are not being concerned about the future predication. AI is transforming as an emerging sector in controlling electrical automation (Cubillos, 1998).AI can do a large number of simple works in controlling electrical automation with outstandingprecisions. There are less errors chances as compared to human counterpart, such as booking and cooperatingregulardesigning of equipments to give the great diagnosis and redesigning scheduling. AI can handle and control all the sensitive activities automatically finding and classifying automation restoration on regular basis. The most important aspect which was calculated was the diagnosis time, very short and exact figure was generated. The related expert calculated the average time to find out diagnosis was 20 minutes. Hence its superior dose of radiation as compared to conventional radiographs. Convolutions neural network mostly used for detection and problem diagnosis in controlling

electrical automation. According to the research CNN is considerable development diagnosis by providing best electrical automation and itsimplementation. Artificial intelligence (AI) is so fast developing technology that empowers machines to perform different tasks which were previously totally depending on humans. Improvement in AI offers enormous benefits in electrical equipmentssuch as improving quality of life of materials, empowering decision-making, minimize postoperative complications and removing all the extra procedures when implemented to the field of electrical equipments as well in electrical automation. According to the research there are some many aspects in pipe line for the future in electrical automation sector particularly having the concept of AI. If the current image quality is not so clear and not visible in some complex data classification, it is the future vision of AI to find a solution for this kind of problem and generate a solution which is reliable in all angles. Electrical automation is as complex as doing by only human beings, but if it is compared by implementing AIelectrical automation is so easy and simple to do. AI applications are capturing different sectors among them one is electrical automation (Tsai, 2003). AI has extreme power and spectacular potential to enhance automation care and modernized the work care of electrical automation. In automation AI has investigated for different benefits such as identification of normal and abnormal structure.

III. CONCLUSION

To conclude all the perspectives of controlling electrical automation procedures, we had reached out to say statistically that AI has enough advantages over the conventional ones in terms of automationand electrical equipmentssector, furthermore AI is key to the challenges the complexity and uniqueness of designingelectrical equipments. Artificial intelligence is the process of combining both algorithm and electricalequipments into one unit, to strengthen its performances. Electrical automationprocessin this paper is done by using one of most valuable and usable software called AI(Power, 2005). But before implementing the real work of electrical automation, we had developed a design by using artificial intelligence software, and that design was transformed to real work. The advantage of this work is simplicity and feasibility to access all the angles of the electrical equipments by using images developed by AI(Lecun, 2015). The depth analysis of AI and its future and present in electrical automation illustrates that future of the automationis totally relaying on technology based designing of electrical automation. Artificial intelligence and its relation with electrical automation is now a day's very popular and has more advantages over the conventional designing of equipments and its structure, currently we see complex designing of electrical equipments with great advantages such as less time more work done, accuracy, and many more, these all can only be achieved if we implement the concept and idea of AI. It is the most acceptable system to resist in all circumstances. Most of the countries are willing to use the concept of AI in their electrical automation equipments; the method is yet to become the most popular. The present paper is concerned with AI and automaton weather controlling of equipments or extracting the problem. As far the world electrical automationis concerned AI had brought enough revolution in the field of electricity, as being said demands are vast and designing is shuffle due to modernization of electrical field, the conventional way of designing equipment is totally failed to face these challenges, despite that AI made all the wishing of designing possible by applying simple and astonishingtechniques. Superior firm performances cab be achieved by promoting and keeping competitive advantages, The successful operation which is based on AIis always in mood to complete all the needs and desires of its customers through its remarkable services.

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