Advancement in Power Systems

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ABSTRACT: Electricity requirement in every state and country is important, so if electricity is required then continuous and good or reliable supply of electricity is must, artificial intelligence becoming very vast and growing in every field of work like electrical power system, electronics and industrial soft wares and tools or building. Artificial intelligence plays a very important role in daily life, in home automation and office automation. Research work on power systems keeps on increasing year by year and now artificial intelligence is used to make power systems smart, on the basis of place and weather or any particular location power system depends upon the location. Some more factors are there on which power system depends such as introduction of new technology, enhancement and modification in technology and equipment, transmission, and distribution of electricity. AI stands for artificial intelligence becoming the smart method to analyses and solve any problem, so it can be used to solve the different problems that arise in power systems like control, planning scheduling, forecast etc. AI is a smart computerized brain which can be able to detect and solve different problems related with power systems, AI is a technology that can solve many complex electrical interconnections installed to meet increasing load demand. Application and use of this technology called artificial intelligence has been very much in use in some areas related with power system engineering. In this paper discussed the use of artificial intelligence in solving complex electrical interconnections and the scope of AI in power systems.

KEYWORDS*: Artificial intelligence, Complex Electrical, Electrical circuit, Interconnection, Power system engineering, Smart.

I.   INTRODUCTION

Artificial intelligence plays a very important role in daily life, in home automation and office automation. Research work on power systems keeps on increasing year by year and now artificial intelligence is used to make power systems smart, on the basis of place and weather or any particular location power system depends upon the location. Some more factors are there on which power system depends such as introduction of new technology, enhancement and modification in technology and equipment, transmission, and distribution of electricity [1].
a power system is the combination of electrical components and a network so that it can supply electric power from one place to another. Power systems engineering is a subdivision of electrical engineering that deals with the generation, transmission, distribution and utilization of electric power and the electrical devices connected to such systems like generators, motors and transformers. It explained artificial intelligence is known to be intelligent because of its smart decision according to the requirement of the systems [2]. For example robots and computer programs work on artificial intelligence. Artificial intelligent engaged with intellectual process features and properties of human, like ability and potential to think and learn, artificial intelligent able to find out and analyze the meaning behind the problems, it can able to generalize, distinguish between right and wrong decision, it has excellent learning ability from past experience and improve their mistakes [3].

II.   WHAT IS THE ARTIFICIAL NEURAL NETWORK (ANN)?

Artificial Neural Networks are biologically inspired systems which convert a set of inputs into a set of outputs by a network of neurons, where each neuron produces one output as a function of inputs. A basic neuron which is the smallest unit of a matter taken as a controller or processor which is able to convert a single linear input into a single

output. Working of neurons is on a very micro level so that its working and pattern of their connection with each other can be relatable with the natural or real time problem faced by human beings or machines [4]. ANN used to make computers and many electronics chips, devices to solve the real world problems and make their task easy, it made its own pattern by learning from the real problem from surrounding or that particular thing. ANN has three layer which is:
Input layer: Input layer is the basic layer which starts the working of the function but it does not perform any task it only distributes programmers or work to other layers.
Hidden or Middle layer: It is not clearly visible from outside the network, it is hidden between two layers and helps both layer for the plotting and mapping of nonlinear networks.

III. LITERATURE REVIEW

There has been many research paper published in the field ofpower systems engineering and year by year enhancement in technology has been shown which also helps in the field of power systems, a research paper titled Artificial Intelligence in Power Systems by R.Pashupatinath, V.NishanthBalaji discussed the what is power system and how it modifies year by year and explains that power system is the combination of electrical component and network so that it can supply electric power from one place to another. Power systems engineering is a subdivision of electrical engineering that deals with the generation, transmission, distribution and utilization of electric power and the electrical devices connected to such systems like generators, motors and transformers [5]. In this paper I explained what artificial intelligence is and how it will be helpful in the power system. It explained artificial intelligence is known to be intelligent because of its smart decision according to the requirement of the systems. For example robots and computer programs work on artificial intelligence.
Artificial intelligent engaged with intellectual process features and properties of human,like ability and potential to think and learn, artificial intelligent able to find out and analyse the meaning behind the problems, it can able to generalize, distinguish between right and wrong decision, it has excellent learning ability from past experience and improve their mistakes. Artificial general intelligence (AGI) is the intelligence of a hypothetical machine or computer which can accomplish any intellectual assignment successfully which a human being can accomplish. It also explains the need of AI in power systems, different networks used to solve the power systems problems such as artificial neural networks, in this paper also explained the advantages and disadvantages of artificial intelligence also give ideas about the application of artificial neural networks. In this paper also explain how ANN (artificial neural network) can be used in power systems. In this paper give idea about the fuzzy logic, fuzzy logic is the study of system in a discrete manner, explain of fuzzy logic, give description abbott the fuzzy logic controller, application of fuzzy and its controller, explain reactive power and voltage control, explains how fuzzy logic use in power system. A system also explained in this paper named expert system, further explained advantage and disadvantage and application of expert system in power system also explain how expert system used in power system. What is genetic algorithm and its application in power systems, advantages and disadvantages of genetic algorithms in power system? Also shows the practical implementation of AI in transmission line, comparison of different AI techniques in power system protection. There has been artificial intelligence used in power systems from many times, this also explained in this paper [6].
In a research paper titled Artificial intelligence in electric power systems, A survey of the Japanese industry by SaifurRahman discussed about R&D in Japanese Electric Power Industry, Companies, R&D Laboratories and Universities Visited, Application of AI in the Japanese Power Industry, Strategy to Promote AI Applications, Need for AI Applications in power systems, Collaborative Research Activities in AI. Explain Diversity in the Collaborative Research, also explain and show via block diagram Reflections From an Early Expert System Application, in this paper also explain the Some Recent Activities based on power systems, Problems and Promises of AI Tools, Shortcomings and Unexpected Outcomes, Classification Of the Application Of AI Tools. Give brief of a Generalized Approach to Developing Expert Systems. In this paper I explained what artificial intelligence is and how it will be helpful in the power system. It explained artificial intelligence is known to be intelligent because of its smart decision according to the requirement of the systems.
For example robots and computer programs work on artificial intelligence [7]. Artificial intelligent engaged with intellectual process features and properties of human, like ability and potential to think and learn, artificial intelligent able to find out and analyze the meaning behind the problems, it can able to generalize, distinguish between right and wrong decision, it has excellent learning ability from past experience and improve their mistakes. Artificial general

intelligence (AGI) is the intelligence of a hypothetical machine or computer which can accomplish any intellectual assignment successfully which a human being can accomplish. It also explains the need of AI in power systems, different networks used to solve the power systems problems such as artificial neural networks, in this paper also explained the advantages and disadvantages of artificial intelligence also give ideas about the application of artificial neural network [8].

IV. CONCLUSION

In this paper I explained what artificial intelligence is and how it will be helpful in the power system. It explained artificial intelligence is known to be intelligent because of its smart decision according to the requirement of the systems. For example robots and computer programs work on artificial intelligence. Artificial intelligent engaged with intellectual process features and properties of human, like ability and potential to think and learn, artificial intelligent able to find out and analyze the meaning behind the problems, it can able to generalize, distinguish between right and wrong decision, it has excellent learning ability from past experience and improve their mistakes.In this paper discussed the main feature of power system design and planning is reliability, which was simply determined by using discretes methods, more particularly old techniques of artificial intelligence in power systems not being able to fulfill the chance of required load study and cost analysis. AI stands for artificial intelligence and may increase in maintenance and operating cost. Many research papers have been published to enhance the interest of AI in the field of power systems. A lot of research is yet to be performed to perceive. There are many advantages and disadvantages of this technology (AI) in power systems but artificial intelligence helps in a good way to improve efficiency and reliability of the network also controls distributed control and monitoring, efficient system analysis, particularly power systems which use renewable energy resources for operations.

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