A NOVEL STUDY ON ARTIFICIAL INTELLIGENCE &ASSOCIATED TECHNOLOGIES AND ITS APPLICATIONS

[1]S.Rajini Parimala,[2]Dr. M. Suresh,[3]B.Seva Naik

[1,2,3]Department of Computer Science and Engineering, Mahaveer Institute of Science & Technology, Hyderabad.

Abstract-In future, Intelligent Machines will replace or enhance human capabilities in many areas. It is the subfield of Computer Science Engineering. Today, Artificial Intelligence has given rise to the rapidly growing technology.Artificial Intelligence systems are built with the purpose of self-learning through emergent complex behavior of simple parts. The most common example of this is Artificial Neural Networks. The applications of Artificial Intelligence having a huge impact on various fields to solve the complex problems in various areas like Science, Engineering, Business, Medicine, Weather Forecasting. In this paper, applications of Artificial Intelligence and its associated technologies, architecture Natural Language processing (NLP) and ethics.

Nowadays, there is a growing number of patients and with this increase arises the necessity for new techniques to accurately diagnose and predict in its different forms and thus playing a huge part in improving the quality of life. Many powerful methods are developed in order to generate artificial earthquake records. integration of neural network like backpropagation neural network and particle swarm optimizing (PSO) to recognition the X-Ray of chest for some lung disease cases (like Tuberculosis, TB. etc.) along with the normal case. These techniques can act as a realistic simulator of the production line itself, allowing adjusting manufacturing parameters to obtain a better product with lower costs. Text Analytics has also been called text mining, and is a subcategory of the Natural Language Processing (NLP) field, which is one of the founding branches of Artificial Intelligence. In transport planning and engineering systems, the Automated Licensed Number Plate Recognition (ALNPR) can provide a valuable data source. Artificial Intelligence is the field studies the synthesis & analysis of computational agents that act intelligently. Artificial Intelligence Moblet using novelty OS by controlling the system through voice and the nature of intelligence. The modification is based on the assumption that there are algorithms which are inductive by construction, but can be mathematically proved. The content of traditional artificial intelligence concepts (knowledge, form of presentation, knowledge base, etc.) is determined within the proposed paradigm.

I. Introduction

Artificial Intelligence is a branch of computer science, behave like humans. The term was introduced in 1956 by John McCarthy at the Massachusetts Institute of Technology [1]. Artificial Intelligence (AI) is defined as intelligence, to solve complex problems and such a system is generally assumed to be a computer or machine. Artificial Intelligence is language, integration of integration of Computer Science and Physiology Intelligence to achieve goals in the world. Artificial Intelligence is the ability to think to imagine creating memorizing and understanding, recognizing patterns, making choices adapting to change and learn from experience.

Tech titans like Google, Amazon, Microsoft, and Apple already have made huge investments in artificial intelligence to deliver tailored search results and build virtual personal assistants.

Artificial Intelligence can be divided into two categories.

1) **Strong AI or general AI (AGI)**

2) **Weak AI or Narrow AI**

A. Strong AI

The principle of Strong AI is that the machines can be made to think in other words represents the human minds in future.

B. Weak AI

Weak AI simply state thinking like features can easily added to the computers to make them more useful tools

An Artificial Neural Network (ANN) is an imitation to the basic human brain operation and it is an interconnected neurons system that is capable of computing values using mathematical functions in which they determine the activation of the neuron [5][6].
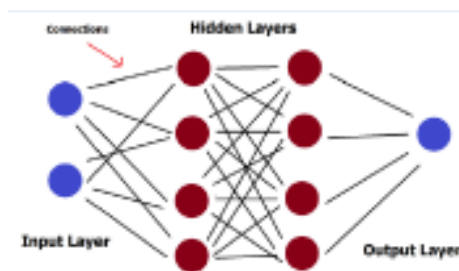

Fig. 1 Artificial neural network model

II. Overview Of AI

Artificial Intelligence has three applications. They are: Cognitive Science Applications, Robotic Applications and Natural Interface Applications**.**
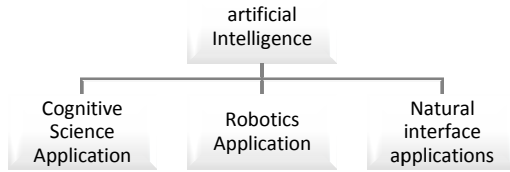

Fig 2: AI Overview

A. Cognitive Science Application

Cognitive science is the scientific study of the mind, brain, and intelligence, particularly as it relates to mental abilities such as reasoning, decision making, memory, learning, attention, language, perception, and motor control. This young and emerging interdisciplinary field lies at the intersection of psychology, computer science, philosophy, neuroscience, and linguistics. Cognitive science Applications are expert systems, learning systems, Fuzzy Logic, Genetic algorithm, Neural Networks and Intelligent Algorithm [2].
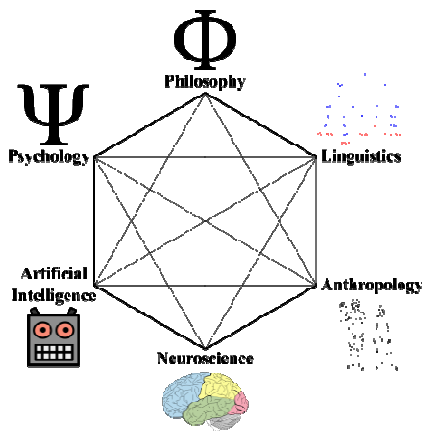

Fig 3: Cognitive science Applications

B. Robotic Applications

Robotics has a great potential for assisting in the complex task of extracting and processing minerals from the ground. Just as the advent of computer technology has made a significant impact on computer aided design and planning, the advent of robotics will make a significant impact on the mining industry [4]. The robotic applications are visual perception, Tactility, Dexterity, Locomotion, Navigation.

C.Natural Interface Applications

A natural user interface, or NUI, or natural interface is a user interface that is effectively invisible, and remains invisible as the user continuously learns increasingly complex interactions. The word natural is used because most computer interfaces use artificial control devices whose operation has to be learned.

III. Applications Of AI Techniques

Artificial intelligence in the form of Neural Networks and Expert Systems ofmanyapplications are play important role in our daily activities.

A. Power System Stablizers (Pss) Design

The basic function of Power System stabilizers is to apply to the excitation system, produces electrical toques to the rotor in phase with speed differences that damp out power oscillations. In this field of Power systems operation of computer programs are executed and modified frequency according to the any variations. The AI has to ability to deal the high non-linearity of practical systems.

B. Network Intrusion Detection

Intrusion Detection System is the process of monitoring the events occurs in networks and detecting the intrusions. Artificial Intelligence techniques to protect the computers and communication networks from intrusions.

C.Medical Area

Artificial intelligence techniques have the potential to be applied in almost every field of medical area. [9].Fuzzy expert systems use the the structure of a series of "if – then" rules for modeling.The most widely used form of evolutionary computation for medical applications are "Genetic Algorithms" [10]. "Genetic Algorithm" based on the natural biological evolution are the most widely used form of evolutionary computation for medical applications. The principles of Genetic algorithms have been used to predict outcome in critically ill patients. evolution are the most widely used form of evolutionary computation for medical applications. The principles of Genetic algorithms have been used to predict outcome in critically ill patients.

Mycin a rule-based expert system for identifying bacteria causing infections and recommending antibiotics to treat these infections for medical diagnosis [11].

Model-based intelligent analysis and decision-support tools are important in medical imaging for computer-assisted diagnosis and evaluation [12].

D. Accounting Databases

Artificial Intelligence tools or techniques that help in the broader understanding of events captured by the accounting system. Artificial intelligent systems with accounting databases can assist (either with the decision maker or independent of decision make in the investigation

of large volumes of data with or without direct participation of the decision maker[13].

E. Computer Games

The four artificial intelligence techniques used are Path Finding, Bayesian Networks, Fuzzy Logic, and Genetic Algorithms which help a computer game provide non-playing character path finding and decision making as well as learning. AI uses Microsoft Xbox 360 Kinect for body motion detection.

F. Weather Forecasting

Neural networks are used in predicting weather forecasting conditions, analysis the data for patterns and predicting the future weather conditions

G. Expert Systems

Expert Systems are machines that are trained to have total expertise in specific areas of interest. They are developed to solve the problems in niche areas. These systems use statistical analysis and data mining to solve these problems by deducing the solutions through a logical flow of yes-no questions. An expert system has three components. Knowledge basestores all the information, rules, data and relationships that are needed by the expert system to have total expertise in its area of interest. Inference engineseeks information from the knowledge base on being presented with a query, analyses it and responds with a solution or recommendation in the way a human expert would Rule based is a conditional statement that links the given conditions to the final solution.

H.Data Mining Or Knowledge Extraction

Data mining is a fast-growing area.AI systemshasthree fundamental techniques in knowledge processing systems. They are Knowledge Representation, Knowledge Acquisition, and Inference including Search and Control.

Figure 4

I. Natural Language Processing (NLP)

Natural Language processing isone of the upcoming applications of AI.The goal of theNatural Language Processing is to design and build softwarethat will analyse, understand, and generate languages thathumans use naturally, so that eventually you will be able toaddress your computer as though you were addressing anotherperson.

Advantages Of NLP System

Natural Language processing system advantages are [15]:

- Services are Improved from our public administration and public service agencies.
- Wide accessibility of information through easier use of computer systems and Information Services.
- Enhanced ability to compete in global markets.
- Saving time by using intelligent computer systems as our agents.
- Improvements in the quality of information recorded in information systems.
- Better filtering of information when we need it.
- More effective international co-operation.
- Improved safety through 'hands-free' operation of equipment.
- Greater security through voice verification techniques

NLP is a very broad area, has a huge amount of subdivisions like Natural Language Understanding, Natural Language Generation, Knowledge Base building, Dialogue Management Systems, Speech Processing, Data Mining, Text Mining, Text Analytics, and so on. Text Analyticsis gained popularity like Big Data, refers unstructured text or other information sources including tweets, blogs, wikis and surveys [16][17].

The by far biggest investors in A.I. technology are Facebook, Google, Yahoo, Baidu and Microsoft. all

Figure 5

the leading researchers in the field and setup their own research labsinternally. A.I. bears the promise ofan automatic analysis and management of this Data.

J. Product Manufacturing

artificial neural networks and fuzzy logic are two promising tools based on artificial intelligence to improve theproduct manufacturing companies. These newmodeling and manufacturing control techniques allow companies tosignificantly increase their competitiveness by reducing

manufacturingand testing times and costs without decreasing the reliability of theresults [19].

IV. Ethics of AI

The ethical issues related to the possible future creation of machines with general intellectual capabilities far outstripping those of humans are quite distinct from any ethical problems arising in current automation and information systems.

thesuperintelligence may become unstoppably powerful because of its intellectual superiority and the technologies it could develop, it is crucial that it be provided with human-friendly motivations. A superintelligence is any intellect that is vastly outperforms the best human brains in practically every field, including scientific creativity, general wisdom, and social skills [20].

Several authors have argued that there is a substantial chance that superintelligence may be created within a few decades, perhaps as a result of growing hardware performance and increased ability to implement algorithms and architectures similar to those used by human brains.superintelligence is not just another technology, another tool that will add incrementally to human capabilities

Let us consider some of the unusual aspects of the creation of superintelligence[22]:

- Superintelligence may be the last invention humans ever need to make.

- Technological progress in all other fields will be accelerated by the arrival of advanced artificial intelligence

- Superintelligence will lead to more advanced superintelligence

- Artificial minds can be easily copied

- Emergence of superintelligence may be sudden.

- Artificial intellects are potentially autonomous agents

- Artificial intellects need not have humanlike motives

- Artificial intellects may not have humanlike psyches

V. Conclusion

In Computer Science world has a lot of benefits from various AI approaches. AI makes very flexible and powerful. AI applications are very well suited for real time systems because of their quick response and less computational times which are due to their parallel architecture. The goal of artificial intelligence is to create computers whose intelligence equals or surpasses humans.

The field of artificial intelligence gives the ability to the machines to think analytically, using concepts. Artificial Intelligence will continue to play an increasingly important role in the various fields. This paper is based on the concept of artificial intelligence, various areas of artificial intelligence and the artificial intelligence techniques like accounting, medical, manufacturing and data mining etc.

References

[1] M. Amirtha Krishnan, C. Gowri Shankar, R. Venkatesh,Artificial Intelligence Bigdata MOBLET : A Review, IJSRSET, Volume 2 , Issue 1.

[2] JatinBorana, Applications of Artificial Intelligence & Associated Technologies, Proceeding of International Conference on Emerging Technologies in Engineering, Biomedical, Management and Science [ETEBMS-2016], 5-6 March 2016.

[3] http://www.cogsci.rpi.edu/pl/cognitive-science

[4] Raman Janakiraman, B. Manas Das,Application of Artificial Intelligence and Robotics to Mining,

[5] Z. Chi, Z. Lu and F. Chan, "Multi-channel handwritten digit recognition using neural networks", Circuit and Systems ISCAS'97 proceeding of1997 IEEE International Symposium, Vol.1, 1997, pp. 625-628.

[6] K. Tadashi; U. Junji; T. Shoichiro, "Hybrid GMDH-type neural network using artificial intelligence and its application to medical image diagnosis of liver cancer", System Integration (SII), 2011 IEEE/SICE International Symposium on 2011, pp. 1101-1106.

[7] MahdiyehEslamiI, HussainShaareef, Azah Mohamed, "Application of artificial intelligent techniques in PSS design: a survey of the state-of-the-art methods".

[8] FataiAdesinaAnifowose, SafiriyuIbiyemiEludiora, "Application of Artificial Intelligence in Network Intrusion Detection", World Applied Programming, Vol (2), No (3), March 2012.

[9] Zadeh L, Information and ControlVolume 8, Issue 3, June 1965, Pages 338-353

[10] Holland JH, "Adaptation in natural and artificial systems: an introductory analysis with applications to biology, control, and artificial intelligence"

[11] Daniel B. Neill, "Using Artificial Intelligence to Improve Hospital Inpatient Care".IEEE

Intelligent Systems(Volume: 28, Issue: 2, March-April 2013).

[12]   S.N. Deepa, B. Aruna Devi, "A survey on artificial intelligence approaches for medical image classification", Indian Journal of Science and Technology, Vol. 4 No. 11 (Nov 2011).

[13]   Daniel E.O.‟Leary Artificial Intelligence and Expert System in Accounting Databases: Survey and Extensions", Expert Systems with Applications, vol-3, 1991.

[14]   Charles Weddle, Graduate Student, Florida State University "Artificial Intelligence and Computer Games", unpublished.

[15]   UnnatiDhavare, Prof. UmeshKulkarni,, International Journal of Emerging Trends & Technology in Computer Science (IJETTCS), Volume 4, Issue 2, March-April 2015 ISSN 2278-6856

[16]   Xerox Corporation (2015): http://www.xrce.xerox.com/Research-Development/Industry-Expertise/Finance (accessed 26 December 2015)

[17]   Antonio Moreno, Teófilo Redondo, Text Analytics: the convergence of Big Data andArtificial Intelligence, International Journal of Interactive Multimedia and Artificial Intelligence, Vol. 3, Nº6.

[18]   The New Wave of Artificial Intelligence, White Paper, EVRY

[19]   Fernández FG, and Izquierdo SI, The Use of Artificial Intelligence in Forest Product Manufacturing: A LowcostImprovement in Competitiveness, Industrial Engineering &Management

[20]   Bostrom, N. (1998). "How Long Before Superintelligence?"International Journal of Futures Studies.

[21]   Bostrom, N. (2002). "Existential Risks: Analyzing Human Extinction Scenarios and Related Hazards." Journal of Evolution and Technology, 9.

[22]   Nick Bostrom, Ethical Issues in Advanced Artificial Intelligence.