Human Friendly Evolvement of Artificial Intelligence

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Abstract— Artificial Intelligence (AI) has affected human life immensely. Our day to day routine can be changed by this. The work can be done faster as well as efficiently and the cost can be reduced too. The cost of a task performed by a human being is much higher than the task performed by machine. It also removes the factor of human error in any task thus, saving many lives. Smart or intelligent machines will slowly replace and enhance human capabilities in many areas. Our economic and socialistic ways will be altered like never before. The applications and areas employing artificial intelligence has seen an increase in the quality and efficiency which has been illustrated in this paper.

Key words: Artificial Intelligence, Machine Learning, Artificial Neural Networks, Natural Language Processing, Knowledge Based Systems

I. INTRODUCTION

According to the father of Artificial Intelligence, John McCarthy, it is "The science and engineering of making intelligent machines, especially intelligent computer programs". Artificial Intelligence is an approach to make a computer, a robot, or a product to think how smart human think. AI is a study of how human brain think, learn, decide and work, when it tries to solve problems. And finally this study outputs intelligent software systems.The aim of AI is to improve computer functions which are related to human knowledge, for example, reasoning, learning, and problem-solving.

As technology expands into virtually every corner of human experience, it's clear that computers with sophisticated artificial intelligence (AI) capabilities are more than simply a sum of their chips.

Much like humans, these computers learn from experience. In their case though, the experience is gathered from data. Computers are brilliant at computational intelligence – remembering, calculating probability, discerning patterns in datasets too subtle for people to notice. This capacity is harnessed in the field of predictive analytics using machine learning.

II. AREAS OF ARTIFICIAL INTELLIGENCE

A. Natural Language Processing

The ability of computers to communicate with people in natural language.

The field of NLP involves making computers to perform useful tasks with the natural languages humans use. The input and output of an NLP system can be -
- Speech
- Written Text

Components of NLP:
1) Natural Language Understanding (NLU)
2) Natural Language Genertion (NLG)

B. Computer Vision

Computer vision is a field that includes methods for acquiring, processing, analyzing, and understanding images and, in general, high-dimensional data from the real world in order to produce numerical or symbolic information, e.g., in the forms of decisions.

In AI this means that you process your image/video sources to exctract meaningful information and take action based on that.

C. Knowledge based Systems

Systems that contain a 'database' of knowledge and can help in finding information, making decisions and planning.

KBSs use explicit representations of knowledge in the form of words and symbols. This explicit representation makes the knowledge more easily read and understood by a human than the numerically derived implicit models in computational intelligence
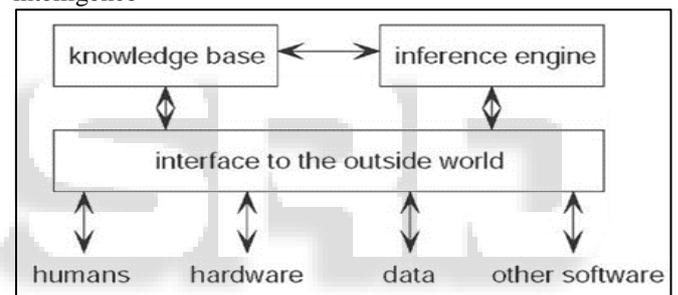

Fig. 1: KBS Architecture

D. Automatic Programming

When computer programming is done by a machine, the process is called automatic programming. People have tried for 60 years to build systems that can write code, but the problem is that these methods aren't that good with ambiguity.

AI researchers are interested in studying automatic programming for two reasons:

It would be highly useful to have a powerful automatic programming systems that could receive casual and imprecise specifications for a desired target program and then correctly generate that program automatic programming is widely believed to be a necessary component of any intelligent system and is therefore a topic for fundamental research in its own right.

E. Intelligent Computer-Aided Instruction

Customising the tutoring of a student to fit the students learning style.

Intelligent computer-assisted instruction (ICAI) uses artificial intelligence techniques to imitate in computer form the power of human tutorial processes. Its major technical features are the use of a modularized knowledge base instead of CAI's textual scripts, and the ability to

interpret the student's statements and questions expressed in natural English.

F. Data Science

We all are aware of the fact that data is increasing and growing at an unprecedented rate and it is very important to organize such data and understand it.

The understanding of data will not only help in organizing it but it will also help in managing your work and making you aware what impact data takes place.

Data Science helps you manage your data, analyze it and create meaning for the data that you have. All this is possible by applying data analytics to the data and then coming up with some meaning that is understandable by the end user.

G. Machine Learning

One of the most used word in the year 2017 in terms of technology advances in Machine Learning. Machine Learning is creating news/buzz each day with some new product launched by a company which makes use of ML techniques and algorithms in order to serve the consumer in a highly productive manner.

Machine Learning allows companies and individuals to perform tasks that can help them classify, categorize and predict data from a given dataset. Machine Learning models are made by complex math level skills which are then coded in a language in order to build the entire system.

H. Neural Networks and Coginitive Science

Neural Networks and Cognitive Science is a branch of Artificial Intelligence, which makes use of neurology.

Neurology means the branch of biology that deals with nerves and nervous system of the human. Majorly this deals with replicating or imitating the human brain.

The human brain contains an infinite number of neurons and to code the brain neurons into a machine or a system is what the task of a neural network is. By using a neural network and machine learning together, many more complex tasks can be performed with ease and many of such tasks can be automated.

III. APPLICATIONS OF ARTIFICIAL INTELLIGENCE

A. Artificial Neural Network

An artificial neuron network is a computational model based on the structure and functions of biological neural networks. Information that flows through the network affects the structure of the ANN because a neural network changes - or learns, in a sense - based on that input and output[1].

− Series of outputs are generated depending on the inputs run in the background.
− The output generated is then compared to known data.

There are two types of ANN topologies:
• FeedForward ANN
• FeedBack ANN

1) FeedForward ANN

A unit sends information to other unit from which it does not receive any information. They are used in pattern/ generation/ recognition classification. There are no feedback loops.
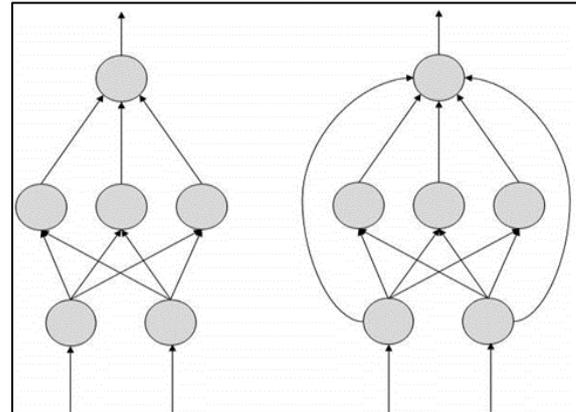
They have fixed inputs and outputs.

Fig. 2: Feed Forward ANN

2) FeedBack ANN

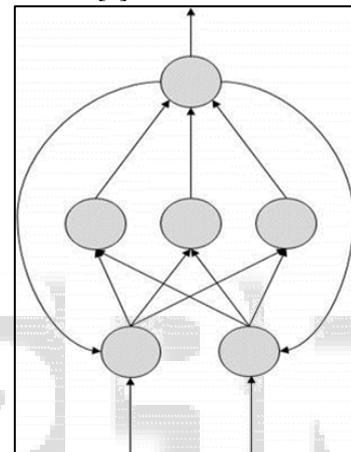Here, feedback loops are allowed. They are used in content addressable memories[1].

Fig. 3: FeedBack ANN

− Aerospace

Autopilot aircrafts, aircraft fault detection.

− Military

Weapon orientation and steering, target tracking, object discrimination, facial recognition, signal/image identification.

− Electronics

Code sequence prediction, IC chip layout, chip failure analysis, machine vision, voice synthesis.

− Financial

Real estate appraisal, loan advisor, mortgage screening, corporate bond rating, portfolio trading program, corporate financial analysis, currency value prediction, document readers, credit application evaluators.

− Industrial

Manufacturing process control, product design and analysis, quality inspection systems, welding quality analysis, paper quality prediction, chemical product design analysis, dynamic modeling of chemical process systems, machine maintenance analysis, project bidding, planning, and management.

− Medical

Cancer cell analysis, EEG and ECG analysis, prosthetic design, transplant time optimizer.

− Speech

Speech recognition, speech classification, text to speech conversion.

− Software

Pattern Recognition in facial recognition, optical character recognition, etc.

− Anomaly Detection

As ANNs are expert at recognizing patterns, they can also be trained to generate an output when something unusual occurs that misfits the pattern.

IV. CHALLENGES

When we say that technology is driving and shaping the future of tomorrow, we do mean that technology has its definite effects on our lifestyle. With Artificial Intelligence in question, success and failure are the same sides of the coin. Technology also has some disadvantages and challenges related to it.

A. Buliding Trust

AI is all related to science and algorithms People who are completely unaware of these algorithms and technology that lies behind the working of Artificial intelligence find it difficult to understand its functioning.

Here is how artificial intelligence can face trust issues with humans. It is a basic human psychology that we often neglect something that we don't understand.

B. AI Human Interface

The challenge here is the shortage of data science skills within humans to get maximum output from artificial intelligence. As for the businesses, there is a shortage of advanced skills.

Business owners need to train their professionals to be able to leverage the benefits of this technology.

C. Investment

Not all business owners or managers are willing to invest in it. The funds required to set up and implement Artificial Intelligence is very high, thus not every business owner or organization can invest in it or can try it for their own business.

D. Untrusted Technology

Technology that will be smarter than us and do everything faster, the possibilities for them will be endless it's little scary.

Facebook made an experiment with to AI chatbots, couple of months ago. And what happened was, the programs started to chat to each other in a strange language. It looks like they invented new language to communicate much faster.

V. CONCLUSION

AI science is the only way that raises the machine intelligence level. Only improve the machine- learning function continuously. Artificial intelligence (AI) is awakening fear and enthusiasm in equal measures. However, where some see danger, others see opportunity. To the ML discussion and the ML research progress, will certainly make the artificial intelligence and the entire science and technology further development.

This is not the end of AI, there is more to come from it, who knows what AI could do for us in the future and may be it will be whole society of robots.

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