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A Brief Approach to Applications of Artificial Intelligence

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ABSTRACT

Machines are the constructs of human intelligence and a requisite part of today's generation. Starting from the root level to the supreme level, all tasks are the result of computations and analysis performed by different types of machines. The prima facie of all these machines have been the programming that is embedded into their systems, which is eventually the subsequent outcome of artificial intelligence. Artificial intelligence can be elucidated as the imitation and incorporation of human intelligence in computers and machines so as to contribute to the world in a positive way. Artificial intelligence has made it possible to make machines the helping hand to humanity. Machines are substantially configured to work under tough conditions to which human race is not adaptive. Application areas of AI are widespread which include namely game playing, speech recognition, understanding natural language, computer vision, expert systems, pattern recognition, medicine, business, weather forecast and many more. This paper aims at harnessing the prevailing statistics over the future by studying the patterns of data. The paper scrutinously studies the role of AI in pattern recognition and the various operations and design of systems related to it. It also throws light on the applications and sub disciplines of data patterns and their utility, based on prior data or statistical information.

Keywords: Artificial Intelligence, Pattern Recognition, Bayesian, Approach, Probabilistic Classifiers

I. INTRODUCTION

The commencement of the exploration of the field of AI goes back to the 1940s when the first culminated machine based on mathematical reasoning was shown the light of the world. The foundation of AI was laid on the concept of mechanising the human thought process. In 1956, AI was considered as an academic discipline. AI can be defined as the amalgamation of human intelligence and computations to yield in problem solving machines through various algorithms. AI has shown potential growth in all the fields with its varied applications in artificial creativity, automated planning, computer audition, recognition, diagnosis, intelligent agent, concept mining, semantic web, natural language processing etc.

Dealing with the security systems and detection system using the entity of AI can be made possible using its attribute of pattern recognitions and Knowledge Discovery in Databases (KDD). It can also be piloted in the field of disaster management which can be achieved through the Detection Intrusion technique featuring AI.

II. METHODS AND MATERIAL

1. Artificial Intelligence

Artificial Intelligence is a term that has been derived by combining two different words namely Artificial and Intelligence.

The term "Artificial" refers to the simulated environments and the non-natural surroundings and the term "Intelligence" refers to the ability to understand and learn from the events that follow. The collaboration of these two terms leads to the phenomenon of AI. AI aims at trying to put the human behaviour involving thinking, reasoning, relating and drawing inferences into a machine under controlled environment to produce efficient results in a right manner. AI has its traces in every field of science. The tasks that promote monotony for humans can be handled easily with the machines

programmed for such kind of task. It is the science and engineering of making machines intelligent.

2. Turing Test Approach

Alan Turing in 1950, proposed a landmark paper in which he rationalised the possibility of creating machines that think. He pondered that "thinking" cannot be defined easily and thus proposed his Turing Test. The Turing Test was based on the fact that a machine can be termed "Intelligent" if it cannot be distinguished by a human in a conversation. It judged the natural language conversations between the human and the machine. It involved the interaction of an interrogator with the machine and the human through a text conversation. The machine would pass the test if the interrogator cannot make out whether the response is coming from a human or a machine. The Turing Test was

the first serious proposal in the AI's philosophy.

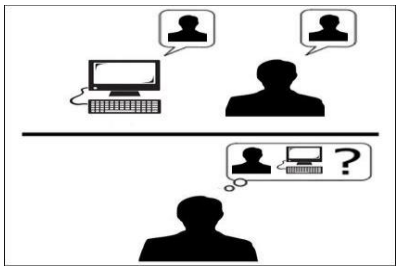

Figure 1 : Alan Turing Test (An interrogator distinguishing between a machine and a human through conversation)

3. Pattern Recognition Using

Artificial Intelligence

Pattern Recognition involves the study of how machines can draw conclusion from different patterns by merely observing them and considering the distortions in sound to reach a particular conclusion. Thus we can say that pattern recognition deals with the classification and description of observations. Patterns may be various set of instances that share some regularities and similarities. They may be repeated patterns which can be observed using sensors to relate and make a reasonable decision that leads to the correct result. Pattern recognition aims at tracing the hidden information in the data for identifying implicit objects. The Pattern recognition technique is an important component of intelligent systems.

A) Optical Character

Recognition (OCR)

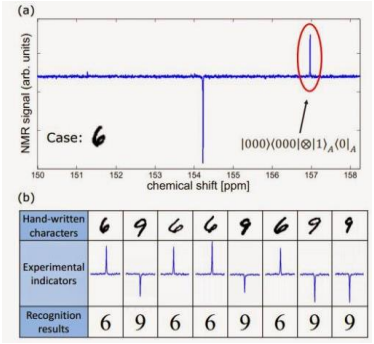

Figure 2. A machine analysing one glyph at a time to recognise the input

OCR is the mechanical or electronic conversion of the handwritten or printed text into machine-encoded text. OCR has the fundamental technique of recognising characters. It is a common method of digitizing printed texts so that it can be electronically edited, searched, stored more compactly, displayed on-line, and used in machine processes such as machine translation, text-to-speech, key data and text mining. Applications of OCR can be traced in data entries for business documents, automatic number plate recognition, extracting business card information etc. OCR analysis a static document and is therefore considered to be an "offline" process. This method of recognition targets one glyph or character at a time which is generally typewritten text. The OCR software pre-processes the images for substantial result.

B) Handwriting Recognition

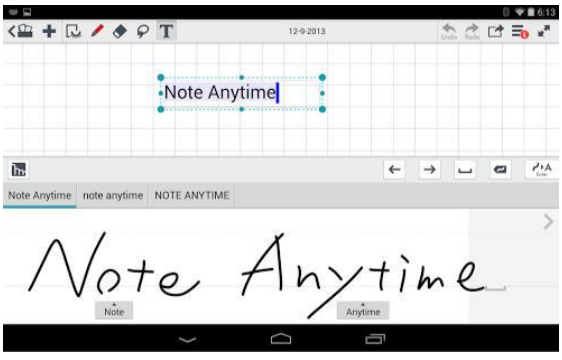

Figure 3. Handwriting recognition software working intelligently using the artificially embedded algorithms

Handwriting Recognition is an application area of Artificial Intelligence which is strongly related to the natural language processing capability of the machine possessing artificial intelligence. Handwriting Recognition works on different concepts of artificial intelligence involving statistical features, structural features and Global transformations and moments features. The raw data is processed through various processing steps to make it descriptive. The various steps involved are noise reduction, Binarization, width normalisation, skew correction and slant removal. Using artificial intelligence it has been possible to draw inferences from the data using the correct and the most efficient methodology for dealing with different sets of data. The application includes the phone systems and the light pen signatures.

C) Speech Recognition

Figure 4. Speech Recognition by machine through signals

Artificial Intelligence has made it possible to help the computers possess the ability to perform various tasks using the input from the user via speech. Speech recognition is simply the conversion of speech or voice into text. The system analyzes the person's specific voice and uses it to fine-tune the recognition of that person's speech, resulting in increased accuracy. The voice dialling, the GPS positioning, hands free mode of driving and car steering systems all involve the use of speech recognition.

These devices are programmed in such a way so that they can identify the input via speech and react accordingly. It uses the acoustic model and the language model for all these conversions.

D) Face Recognition

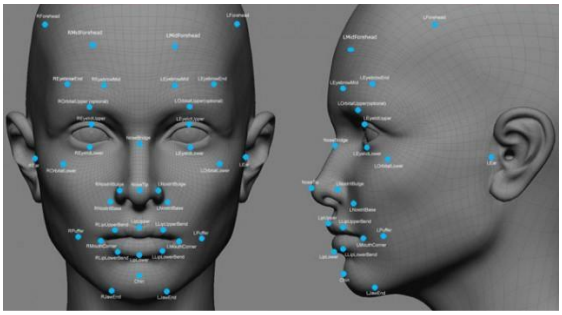

Figure 5. Matching of various perspective for face identification

A facial recognition system is a computer application capable of identifying or verifying a person from a digital image or a video frame from a video source. New advances in facial recognition are a step forward for an artificial intelligence photos even if their faces are obscured which is the latest step AI step.

III. RESULTS AND DISCUSSION

A. Probabilistic Classification

In machine learning, a probabilistic classifier is a classifier that is able to predict, given a sample input, a probability distribution over a set of classes, rather than only outputting the most likely class that the sample should belong to. Probabilistic classifiers provide classification with a degree of certainty, which can be useful in its own right, or when combining classifiers into ensembles. Commonly used loss functions for probabilistic classification include log loss and the mean squared error between the predicted and the true probability distributions. The former of these is commonly used to train logistic models.

B. Applications And Future Use of Artificial Intelligence

Artificial Intelligence is often misunderstood. People‟s eyes often glaze over when we discuss AI. However, there is a common misconception that to understand AI requires an IQ of 200 and a PHD in rocket science. Artificial intelligence in the future will churn out machines and computers, which are much more sophisticated than the ones that we have today. For example, the speech recognition systems that we see today will become more sophisticated and it is expected

that they will reach the human performance levels in the future. It is also believed that they will be able to communicate with human beings, using both text and voice, in unstructured English in the coming few years. However, will artificial intelligence be able to create machines that are self-aware and even more intelligent than human beings - is a question that nobody has an answer to. Also, even if this is possible, how much time it is going to take, cannot be predicted at present.

IV. CONCLUSION

Looking at the features and its wide application we may definitely stick to artificial intelligence. Seeing at the development of AI, is it that the future world is becoming artificial. Biological intelligence is fixed, because it is an old, mature paradigm, but the new paradigm of non-biological computation and intelligence is growing exponentially. The memory capacity of the human brain is probably of the order of ten thousand million binary digits. But most of this is probably used in remembering visual impressions, and other comparatively wasteful ways. Hence we can say that as natural intelligence is limited and volatile too world may now depend upon computers for smooth working.

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