AI-4

## Difference between Human and Machine Intelligence

* Humans perceive by patterns whereas the machines perceive by set of rules and data.
* Humans store and recall information by patterns, machines do it by searching algorithms. For example, the number 40404040 is easy to remember, store, and recall as its pattern is simple.
* Humans can figure out the complete object even if some part of it is missing or distorted; whereas the machines cannot do it correctly.

## Speech and Voice Recognition

These both terms are common in robotics, expert systems and natural language processing. Though these terms are used interchangeably, their objectives are different.

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| **Speech Recognition** | **Voice Recognition** |
| The speech recognition aims at understanding and comprehending WHAT was spoken. | The objective of voice recognition is to recognize WHO is speaking. |
| It is used in hand-free computing, map, or menu navigation. | It is used to identify a person by analysing its tone, voice pitch, and accent, etc. |
| Machine does not need training for Speech Recognition as it is not speaker dependent. | This recognition system needs training as it is person oriented. |
| Speaker independent Speech Recognition systems are difficult to develop. | Speaker dependent Speech Recognition systems are comparatively easy to develop. |

### Working of Speech and Voice Recognition Systems

The user input spoken at a microphone goes to sound card of the system. The converter turns the analog signal into equivalent digital signal for the speech processing. The database is used to compare the sound patterns to recognize the words. Finally, a reverse feedback is given to the database.

This source-language text becomes input to the Translation Engine, which converts it to the target language text. They are supported with interactive GUI, large database of vocabulary, etc.

## Real Life Applications of Research Areas

There is a large array of applications where AI is serving common people in their day-to-day lives −

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| **Sr.No.** | **Research Areas** | **Real Life Application** |
| 1 | Expert Systems  Examples − Flight-tracking systems, Clinical systems. | Expert Systems Application |
| 2 | Natural Language Processing  Examples: Google Now feature, speech recognition, Automatic voice output. | NLP Application |
| 3 | Neural Networks  Examples − Pattern recognition systems such as face recognition, character recognition, handwriting recognition. | Neural Networks Application |
| 4 | Robotics  Examples − Industrial robots for moving, spraying, painting, precision checking, drilling, cleaning, coating, carving, etc. | Robotics Application |
| 5 | Fuzzy Logic Systems  Examples − Consumer electronics, automobiles, etc. | Fuzzy Logic Application |