SKILRY

RESEARCH AREAS OF AI

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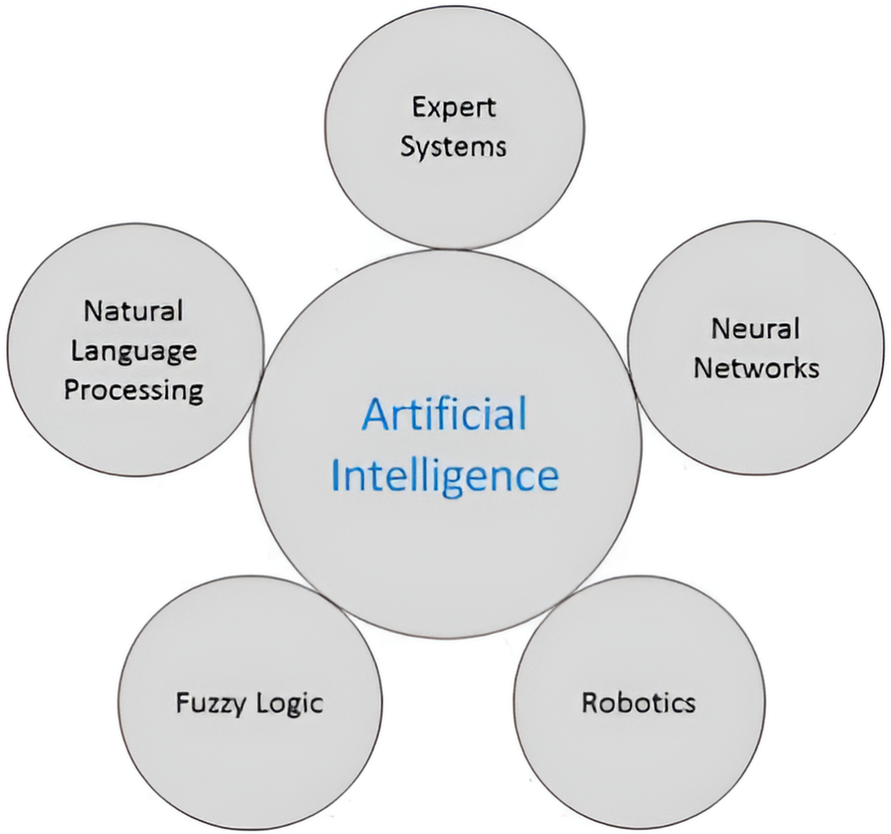
The domain of artificial intelligence is huge in breadth and width. While proceeding, we consider the broadly common and prospering research areas in the domain of AI:



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.

Peech 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 analyzes person's tone, voice pitch, and accent, etc., to identify a person.
Machine does not need training as it is not speaker dependent.	The recognition system needs training as it is person-oriented.

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Machine does not need training as it is not speaker dependent.	The 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.

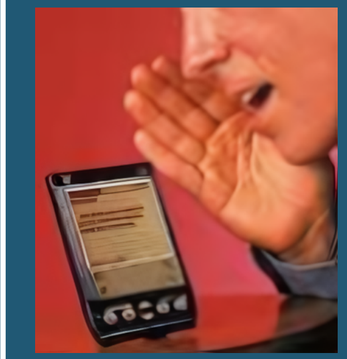
WORKING OF SPEECH AND VOICE RECOGNITION SYSTEMS:-

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 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:

Sr. No.	Research Area	Real Life Application
1.	**Expert Systems** **Examples:** Flight-tracking systems, Clinical systems	
2.	**Natural Language Processing** **Examples:** Google Now feature, speech recognition, Automatic voice output	
3.	**Neural Networks** **Examples:** Pattern recognition systems such as face recognition, character recognition, handwriting recognition.	

Sr. No.	Research Area	Real Life Application
4.	**Robotics** **Examples:** Industrial robots for moving, spraying, painting, precision checking, drilling, cleaning, coating, carving etc.	
5.	**Fuzzy Logic** **Examples:** Consumer electronics, automobiles, etc.	

Task Classificationof AI

The domain of AI is classified into Formal tasks, Mundane tasks, and Expert tasks.

Formal tasks:

- Maths
- Games

Mundane tasks:

- Perception
- Common Sense
- Reasoning
- Natural Language Processing

Expert tasks:

- Medical Diagnosis
- Scientific Analysis
- Engireering
- Financial Analysis

Task Domains of Artificial Intelligence		
Mundane (Ordinary) Tasks	**Formal Tasks**	**Expert Tasks**
Perception • Computer Vision • Speech, Voice	Mathematics Geometry Logic Integration and Differentiation	Engineering Fault finding Manufacturing Monitoring

Task Domains of Artificial Intelligence

Mundane (Ordinary) Tasks	Formal Tasks	Expert Tasks
Natural Language Processing • Understanding • Language Generation • Language Translation	Games • Go • Chess (Deep Blue) • Checkers	Scientific Analysis
Common Sense	Verification	Financial Analysis
Reasoning	Theorem Proving	Medical Diagnosis
Planning		Creativity
Robotics • Locomotive		

Humans learn **mundane (ordinary) tasks** since their birth. They learn by perception, speaking, using language, and locomotives. They learn Formal Tasks and Expert Tasks later, in that order.

For humans, themundane tasks are easiest to learn. The same was considered true before trying to implement mundane tasks in machines. Earlier, all work of AI was concentrated in the mundane task domain.

Later, it turned out that the machine requires more knowledge, complex knowledge representation, and complicated algorithms for handling mundane tasks. This is the reason **why AI work is more prospering in the Expert Task** domain now, as the expert task domain needs expert knowledge without common sense, which can be easier to represent and handle.