



# EASWARI ENGINEERING COLLEGE

( AN AUTONOMOUS INSTITUTION )

BHARATHI SALAI, RAMAPURAM, CHENNAI 600089

DEPARTMENT  
OF  
CSE



CONNECTRIX

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# EASWARI ENGINEERING COLLEGE

## AUTONOMOUS

### COMPUTER SCIENCE AND ENGINEERING

#### VISION

To impart quality education in the field of computer science and engineering and to provide graduates with technical skills enabling them to contribute to the society by solving real world problems and to become a centre of excellence for advanced computing.

#### MISSION

M1. To provide strong foundation in computer science and engineering and in problem solving techniques to become successful professionals in the field of computing and prepare them for higher education.

**M2. To provide students with latest skills in the field of computer science and engineering and to realize the importance of life-long learning.**

M3. To produce graduates with the ability to participate in interdisciplinary collaborations and apply recent computing tools and technologies in new domains and industry.

**M4. To produce graduates capable of ethically and responsibly approaching and committing themselves to the social impact of computing.**

M5. To prepare students to communicate effectively and exhibit leadership qualities to work on diverse project teams.

**M6. To provide research environment for students and faculty to undertake inter-disciplinary research in emerging areas.**

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## PROGRAMME EDUCATIONAL OBJECTIVES

### PEO 1

Graduates will possess the ability to think logically and have capacity to understand technical problems and to design optimal solutions for a successful career in industry, academia and research.

### PEO 2

Graduates will have foundation in mathematical, scientific and computer science and engineering fundamentals necessary to formulate, analyze and solve engineering problems.

### PEO 3

Graduates will have the potential to apply their expertise and current technologies across multiple disciplines to solve real world challenges and research issues.

### PEO 4

Graduates will have the ability to work as a team and will be able to promote the design and implementation of products and services with an understanding of its impact on economical, environmental, ethical, and societal considerations through their strong interpersonal skills, leadership quality and entrepreneurial skills.

### PEO 5

Graduates will possess an urge to learn continuously and to be responsive to the demands of the progressive industrial world by carrying out researches in frontier areas of computer science and engineering.

## PROGRAMME SPECIFIC OUTCOMES

### PSO 1

Analyze, design and develop computing solutions by applying foundational concepts of computer science and engineering.

### PSO 2

Apply software engineering principles and practices for developing quality software for scientific and business applications.

### PSO 3

Adapt to emerging information and communication technologies (ICT) to innovate ideas and solutions to existing/ novel problems.

## PROGRAMME OUTCOMES

**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

**Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

**The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.



# TECHNICAL ARTICLES

## METaverse

METaverse IS A COMBINATION OF MULTIPLE ELEMENTS OF TECHNOLOGY, INCLUDING VIRTUAL REALITY, AUGMENTED REALITY, AND VIDEO WHERE USERS “LIVE” WITHIN A DIGITAL UNIVERSE.

THE CONCEPT IS GRADUALLY GAINING IMMENSE SIGNIFICANCE WITH MANY TECH GIANTS HAVE ALREADY SET IN MOTION THE PROGRESS FOR THIS PROCESS, WITH FACEBOOK AND EPIC LEADING THE PACK.

METaverse ISN'T GOING TO GET BUILT BY ANY ONE COMPANY OR EVEN A SMALL NUMBER OF COMPANIES— BUT THROUGH EMPOWERING MILLIONS OF CREATORS AROUND THE WORLD. IN FACT, AS MARK ZUCKERBERG SAYS, INDIA IS GOING TO BE A HUGE PART OF METaverse CONSIDERING THAT INDIA'S ONLINE GAMING SECTOR, ONE OF THE IMPORTANT COMPONENTS OF METaverse, HAS SEEN A LOT OF GROWTH OVER THE PAST FEW YEARS.



## WHAT IS METAVERSE?

THE METAVERSE IS NOT A NEW IDEA, SCIENCE FICTION WRITER NEAL STEPHENSON COINED THE TERM IN 1992, AND THE CONCEPT IS COMMONPLACE AMONG VIDEO GAME COMPANIES.

METAVERSE IS THE NEXT VERSION OF THE INTERNET FOCUSED ON SOCIAL CONNECTION.

IT CAN BE DEFINED AS A SIMULATED DIGITAL ENVIRONMENT THAT USES AUGMENTED REALITY (AR), VIRTUAL REALITY (VR), AND BLOCKCHAIN, ALONG WITH CONCEPTS FROM SOCIAL MEDIA, TO CREATE SPACES FOR RICH USER INTERACTION MIMICKING THE REAL WORLD.

IT CAN BE IMAGINED AS A 3D VIRTUAL WORLD, WITH EVER-EVOLVING ASPECTS WHICH ARE COLLECTIVELY SHARED BY ITS INHABITANTS - A VIRTUAL WORLD WITH REAL-TIME EVENTS AND AN ONLINE INFRASTRUCTURE.

IN THEORY, IT ENCAPSULATES EVERYTHING THAT'S HAPPENING INTO THE REAL WORLD AND WILL BRING REAL-TIME EVENTS AND UPDATES GOING FORWARD. THE USER EXISTS IN A VIRTUAL WORLD WITHOUT BORDERS.



## WHAT OPPORTUNITIES DOES METAVERSE OFFER?

VIRTUAL COMMUNITIES, ACTIVITIES, EVENTS, ALL SEAMLESSLY ACCESSIBLE WITHOUT THE NEED TO SIGN INTO MULTIPLE APPS.

FOR A USER-CENTRIC APPROACH, A KEY ASPECT OF THE METAVERSE THAT WILL WORK IN ITS FAVOUR IS THE EFFORTLESS TRANSITION FROM ONE TO THE NEXT STEP WITHOUT DISCREPANCIES.

ONE CAN SIGN INTO HIS VIRTUAL OFFICE AS A VIRTUAL AVATAR OF HIMSELF, MEET A CLIENT, TAKE A BREAK OR PLAY A SPORT - VIRTUALLY ALL IN ONE PLACE.

WITH THE COVID-19 PANDEMIC CONFINING US TO OUR HOMES FOR WORK, THE METAVERSE TAKES IT TO ANOTHER LEVEL. IT FACILITATES SEAMLESS CROSS-PLATFORM INTERACTION WITH ONE'S FRIENDS, FAMILY, COLLEAGUES ACROSS THE WORLD.

CROSS-PLATFORM INTERACTION IS IN ITS INFANCY EVEN IN THE GAMING INDUSTRY. WITH THE METAVERSE, CROSS-PLATFORM INTERACTION WILL BE THE GOLD STANDARD FOR SEAMLESS VIRTUAL INTERACTION ACROSS THE GLOBE. ADDRESSES AND PIN CODES WON'T BE A MANDATE ANYMORE.

WITH THE METAVERSE, THE VIRTUAL MARKETPLACE WILL BE A SERIOUS BUSINESS AFFAIR.

BRANDS WILL TRANSFORM THE WAY THEY ADVERTISE, WHICH WILL BE A MEMORABLE EXPERIENCE RATHER THAN THE INTRUSIVE POP-UPS AND FORCED ADS AS SEEN TODAY.



## WHAT ARE THE ASSOCIATED CHALLENGES?

SEVERAL WOMEN HAVE REPORTED INCIDENTS OF HARASSMENT, INCLUDING A BETA TESTER WHO WAS VIRTUALLY GROPED BY A STRANGER. THERE HAS BEEN A REPORTED INCIDENT OF GANG-RAPE AS WELL. IT COULD ALSO LEAD TO NEW SCRUTINY OF OLD ISSUES LIKE PRIVACY AND MANAGING WHO DOES WHAT TO WHOM IN A VIRTUAL WORLD.

THESE ARE EARLY DAYS FOR THE METAVERSE. IF SAFETY ISN'T BAKED EARLY ON INTO ITS DESIGN, IT'LL BE MUCH HARDER TO SECURE DOWN THE LINE. PSYCHOLOGISTS AND SOCIAL SCIENTISTS ACROSS THE WORLD ARE NOW WORRIED ABOUT THE PSYCHOLOGICAL IMPACTS OF DUAL REALITY.

THEY ARE ALREADY PREDICTING A LOSS OF EMOTIONAL QUOTIENT (EQ), A LOSS OF INDIVIDUALITY, AND A DULLING OF OUR SENSITIVITIES WITH SHIFTING TO A VIRTUAL WORLD.





## WHAT COULD BE THE WAY FORWARD?

### ADDRESSING CONCERNS:

*WHILE TECHNOLOGICAL CONSTRAINTS ARE ALWAYS THERE, PRIVACY CONCERNS ARE HARD TO IGNORE. ONE MORE CONCERN IS THE CONCEPT OF CURRENCY IN THE VIRTUAL WORLD. ALL THESE CHALLENGES NEED TO BE TAKEN INTO ACCOUNT.*

*THE GOVERNMENT'S INVOLVEMENT IN METAVERSE IS ALSO A SIGNIFICANT ASPECT AS IT MAY CHANGE THE WHOLE DYNAMIC OF THE METAVERSE SINCE CRYPTOCURRENCY IS ONE OF ITS DRIVING FORCES.*

### UPGRADING TECHNOLOGIES:

*THE METAVERSE IS BEING SEEN AS THE INTERNET 2.0 AND FOR A SMOOTH TRANSITION TO IT, NEW TECH INFRASTRUCTURE NEEDS TO BE CREATED AND PROTOCOLS WRITTEN. TODAY'S INTERNET AS A FILE-SHARING PROTOCOL WILL NEED TO BE RE-IMAGINED FOR THE METAVERSE.*

### INTEGRATING METAVERSES:

*IF FACEBOOK AND OTHER BIG INTERNET COMPANIES BUILD THEIR OWN METAVERSES AND SELL THEIR OWN PROPRIETARY HARDWARE TO ACCESS THESE ZONES, THEN THE RESULT COULD BE A COLLECTION OF ISOLATED WORLDS, FORCING DIGITAL CITIZENS TO PICK WHERE THEY SPEND THE BULK OF THEIR TIME.*



# ARTIFICIAL INTELLIGENCE

*ARTIFICIAL INTELLIGENCE IS THE INTELLIGENCE POSSESSED BY THE MACHINES UNDER WHICH THEY CAN PERFORM VARIOUS FUNCTIONS WITH HUMAN HELP. WITH THE HELP OF A.I, MACHINES WILL BE ABLE TO LEARN, SOLVE PROBLEMS, PLAN THINGS, THINK, ETC. ARTIFICIAL INTELLIGENCE, FOR EXAMPLE, IS THE SIMULATION OF HUMAN INTELLIGENCE BY MACHINES. IN THE FIELD OF TECHNOLOGY, ARTIFICIAL INTELLIGENCE IS EVOLVING RAPIDLY DAY BY DAY AND IT IS BELIEVED THAT IN THE NEAR FUTURE, ARTIFICIAL INTELLIGENCE IS GOING TO CHANGE HUMAN LIFE VERY DRASTICALLY AND WILL MOST PROBABLY END ALL THE CRISES OF THE WORLD BY SORTING OUT THE MAJOR PROBLEMS.*

*OUR LIFE IN THIS MODERN AGE DEPENDS LARGELY ON COMPUTERS. IT IS ALMOST IMPOSSIBLE TO THINK ABOUT LIFE WITHOUT COMPUTERS. WE NEED COMPUTERS IN EVERYTHING THAT WE USE IN OUR DAILY LIVES. SO IT BECOMES VERY IMPORTANT TO MAKE COMPUTERS INTELLIGENT SO THAT OUR LIVES BECOME EASY. ARTIFICIAL INTELLIGENCE IS THE THEORY AND DEVELOPMENT OF COMPUTERS, WHICH IMITATES THE HUMAN INTELLIGENCE AND SENSES, SUCH AS VISUAL PERCEPTION, SPEECH RECOGNITION, DECISION-MAKING, AND TRANSLATION BETWEEN LANGUAGES. ARTIFICIAL INTELLIGENCE HAS BROUGHT A REVOLUTION IN THE WORLD OF TECHNOLOGY.*

## ARTIFICIAL INTELLIGENCE APPLICATIONS:

- AI IS WIDELY USED IN THE FIELD OF HEALTHCARE. COMPANIES ARE ATTEMPTING TO DEVELOP TECHNOLOGIES THAT WILL ALLOW FOR RAPID DIAGNOSIS. ARTIFICIAL INTELLIGENCE WOULD BE ABLE TO OPERATE ON PATIENTS WITHOUT THE NEED FOR HUMAN OVERSIGHT. SURGICAL PROCEDURES BASED ON TECHNOLOGY ARE ALREADY BEING PERFORMED.
- ARTIFICIAL INTELLIGENCE WOULD SAVE A LOT OF OUR TIME. THE USE OF ROBOTS WOULD DECREASE HUMAN LABOUR. FOR EXAMPLE, IN INDUSTRIES ROBOTS ARE USED WHICH HAVE SAVED A LOT OF HUMAN EFFORT AND TIME.
- IN THE FIELD OF EDUCATION, AI HAS THE POTENTIAL TO BE VERY EFFECTIVE. IT CAN BRING INNOVATIVE WAYS OF TEACHING STUDENTS WITH THE HELP OF WHICH STUDENTS WILL BE ABLE TO LEARN THE CONCEPTS BETTER.
- ARTIFICIAL INTELLIGENCE IS THE FUTURE OF INNOVATIVE TECHNOLOGY AS WE CAN USE IT IN MANY FIELDS. FOR EXAMPLE, IT CAN BE USED IN THE MILITARY SECTOR, INDUSTRIAL SECTOR, AUTOMOBILES, ETC. IN THE COMING YEARS, WE WILL BE ABLE TO SEE MORE APPLICATIONS OF AI AS THIS TECHNOLOGY IS EVOLVING DAY BY DAY.



## HISTORY OF ARTIFICIAL INTELLIGENCE:

- ARTIFICIAL INTELLIGENCE MAY SEEM TO BE A NEW TECHNOLOGY BUT IF WE DO A BIT OF RESEARCH, WE WILL FIND THAT IT HAS ROOTS DEEP IN THE PAST. IN GREEK MYTHOLOGY, IT IS SAID THAT THE CONCEPTS OF AI WERE USED.
- THE MODEL OF ARTIFICIAL NEURONS WAS FIRST BROUGHT FORWARD IN 1943 BY WARREN MCCULLOCH AND WALTER PITS. AFTER SEVEN YEARS, IN 1950, A RESEARCH PAPER RELATED TO AI WAS PUBLISHED BY ALAN TURING WHICH WAS TITLED 'COMPUTER MACHINERY AND INTELLIGENCE. THE TERM ARTIFICIAL INTELLIGENCE WAS FIRST COINED IN 1956 BY JOHN MCCARTHY, WHO IS KNOWN AS THE FATHER OF ARTIFICIAL INTELLIGENCE.
- TO CONCLUDE, WE CAN SAY THAT ARTIFICIAL INTELLIGENCE WILL BE THE FUTURE OF THE WORLD. AS PER THE EXPERTS, WE WON'T BE ABLE TO SEPARATE OURSELVES FROM THIS TECHNOLOGY AS IT WOULD BECOME AN INTEGRAL PART OF OUR LIVES SHORTLY. AI WOULD CHANGE THE WAY WE LIVE IN THIS WORLD. THIS TECHNOLOGY WOULD PROVE TO BE REVOLUTIONARY BECAUSE IT WILL CHANGE OUR LIVES FOR GOOD.

## BRANCHES OF ARTIFICIAL INTELLIGENCE:

- KNOWLEDGE ENGINEERING
- ROBOTICS
- MACHINES LEARNING
- NATURAL LANGUAGE PROCESSING

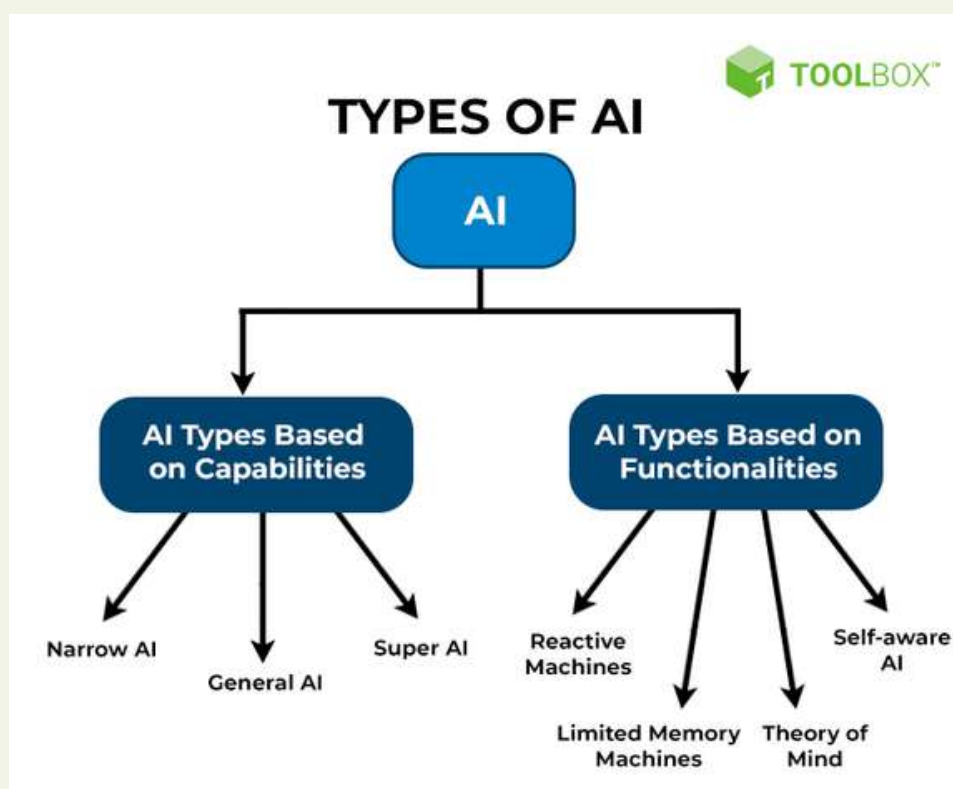
## TYPES OF ARTIFICIAL INTELLIGENCE:

ARTIFICIAL INTELLIGENCE IS CATEGORIZED IN TWO TYPES BASED ON CAPABILITIES AND FUNCTIONALITIES.

- ARTIFICIAL INTELLIGENCE TYPE-1
- ARTIFICIAL INTELLIGENCE TYPE-2

## ARTIFICIAL INTELLIGENCE TYPE-1

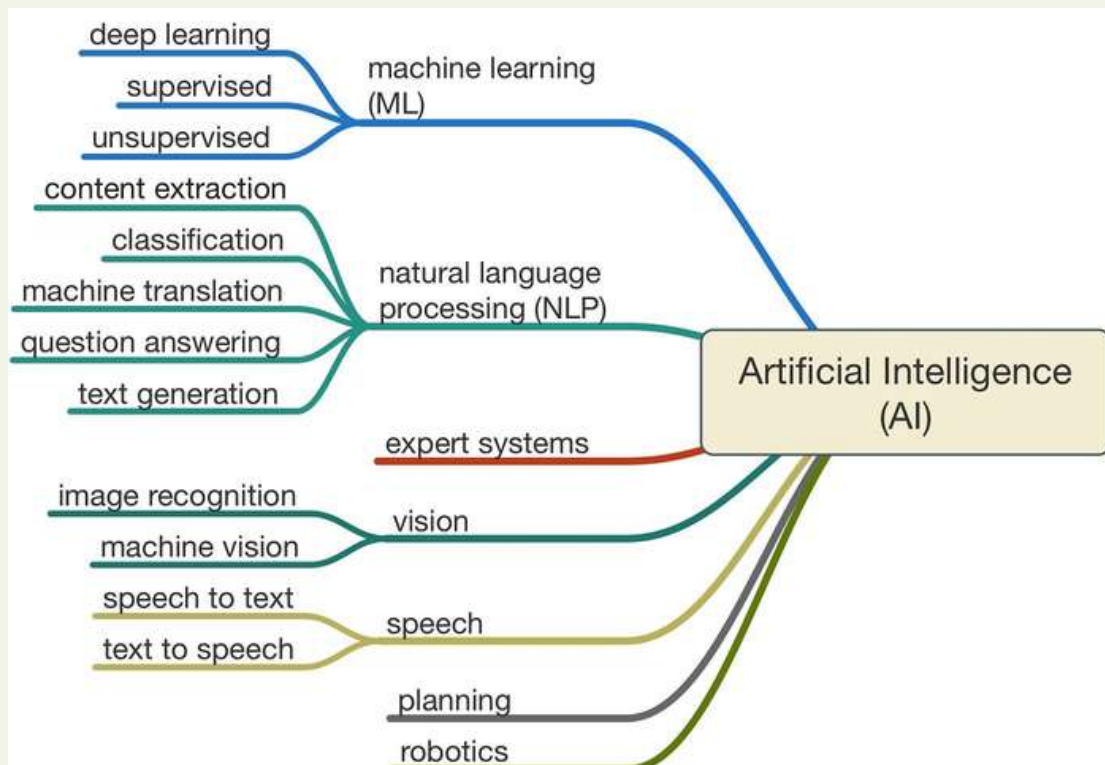
- **NARROW AI (WEAK AI):** THIS IS DESIGNED TO PERFORM A SPECIFIC TASK WITH INTELLIGENCE. IT IS TERMED AS WEAK AI BECAUSE IT CANNOT PERFORM BEYOND ITS LIMITATIONS. IT IS TRAINED TO DO A SPECIFIC TASK. SOME EXAMPLES OF NARROW AI ARE FACIAL RECOGNITION (SIRI IN APPLE PHONES), SPEECH, AND IMAGE RECOGNITION. IBM'S WATSON SUPERCOMPUTER, SELF-DRIVING CARS, PLAYING CHESS, AND SOLVING EQUATIONS ARE ALSO SOME OF THE EXAMPLES OF WEAK AI.
- **GENERAL AI (AGI OR STRONG AI):** THIS SYSTEM CAN PERFORM NEARLY EVERY COGNITIVE TASK AS EFFICIENTLY AS HUMANS CAN DO. THE MAIN CHARACTERISTIC OF GENERAL AI IS TO MAKE A SYSTEM THAT CAN THINK LIKE A HUMAN ON ITS OWN. THIS IS A LONG-TERM GOAL OF MANY RESEARCHERS TO CREATE SUCH MACHINES.
- **SUPER AI:** SUPER AI IS A TYPE OF INTELLIGENCE OF SYSTEMS IN WHICH MACHINES CAN SURPASS HUMAN INTELLIGENCE AND CAN PERFORM ANY COGNITIVE TASK BETTER THAN HUMANS. THE MAIN FEATURES OF STRONG AI WOULD BE THE ABILITY TO THINK, REASON, SOLVE PUZZLES, MAKE JUDGMENTS, PLAN AND COMMUNICATE ON ITS OWN. THE CREATION OF STRONG AI MIGHT BE THE BIGGEST REVOLUTION IN HUMAN HISTORY.





## ARTIFICIAL INTELLIGENCE TYPE-2

- **REACTIVE MACHINES:** THESE MACHINES ARE THE BASIC TYPES OF AI. SUCH AI SYSTEMS FOCUS ONLY ON CURRENT SITUATIONS AND REACT AS PER THE BEST POSSIBLE ACTION. THEY DO NOT STORE MEMORIES FOR FUTURE ACTIONS. IBM'S DEEP BLUE SYSTEM AND GOOGLE'S ALPHA GO ARE THE EXAMPLES OF REACTIVE MACHINES.
- **LIMITED MEMORY:** THESE MACHINES CAN STORE DATA OR PAST MEMORIES FOR A SHORT PERIOD OF TIME. EXAMPLES ARE SELF-DRIVING CARS. THEY CAN STORE INFORMATION TO NAVIGATE THE ROAD, SPEED, AND DISTANCE OF NEARBY CARS.
- **THEORY OF MIND:** THESE SYSTEMS UNDERSTAND EMOTIONS, BELIEFS, AND REQUIREMENTS LIKE HUMANS. THESE KINDS OF MACHINES ARE STILL NOT INVENTED AND IT'S A LONG-TERM GOAL FOR THE RESEARCHERS TO CREATE ONE.
- **SELF-AWARENESS:** SELF-AWARENESS AI IS THE FUTURE OF ARTIFICIAL INTELLIGENCE. THESE MACHINES CAN OUTSMART THE HUMANS. IF THESE MACHINES ARE INVENTED THEN IT CAN BRING A REVOLUTION IN HUMAN SOCIETY.



# TECH BUZZWORDS

Distributed Cloud	Exteded Reality	Quantum Computing
Cybersecurity Mesh	Sustainable Technology	Metaverse
Hyperautomation	Multiexperience	Digital Immune System

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