

Artificial Intelligence in Our Daily Life

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Abstract: *This Thesis explores the integration of Artificial Intelligence (AI) into everyday human routines. It investigates how AI technologies- such as smart virtual assistants, personalized recommendation systems, and autonomous transportation-enhance daily productivity and convenience. Furthermore, the study addresses critical societal challenges, including data privacy, algorithmic bias and job automation, emphasizing the need for ethical guidelines in AI development. By analyzing applications in healthcare, banking, entertainment, and smart homes, the study demonstrates how AI streamlines complex tasks into accessible solutions. Ultimately, the research balances the convenience and efficiency provided by AI with essential discussions on ethics, user privacy, and responsible societal implementation.*

Keywords: Machine Learning, Everyday Applications, Automation, Smart Devices, Data Privacy, Ethical AI, Robotics, NLP, AI Models

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1. Introduction of Artificial Intelligence

It is a branch of Computer Science that pursues creating the computers or machines as intelligent as human beings. It is the science and engineering of making intelligent machines,

especially intelligent computer programs. It is related to the similar task of using computers to understand human intelligence, but AI does not have to confine itself to methods that are biologically observable. Definition: Artificial Intelligence is the study of how to make computers do things, which, at the moment, people do better.

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 a way of making a computer, a computer-controlled robot, or a software think intelligently, in the similar manner the intelligent humans think.

Artificial Intelligence is one of the newest fields of intellectual research, but its foundations began thousands of years ago. In studying Artificial Intelligence, it is useful to have an understanding of the background of a number of other subjects, primarily philosophy, linguistics, psychology, and biology.

There are numerous definitions of what artificial intelligence is. Artificial intelligence is the study of systems that act in a way that to any observer would appear to be intelligent.

- Artificial Intelligence involves using methods based on the intelligent behavior of humans and other animals to solve complex problems.
- Artificial Intelligence is the study of human intelligence and actions replicated artificially, such that the resultant bears to its design can think and act like humans rationality (doing the right thing).
- The art of creating machines that performs functions that require intelligence when performed by humans.
- Artificial Intelligence is a branch of Science which deals with helping machines finds solutions to complex problems in a more human-like fashion.

- This generally involves borrowing characteristics from human intelligence, and applying them as algorithms in a computer friendly way. - GPS - General Problem Solver.

Exactly what is AI?

AI means Artificial Intelligence which is a branch of computer science concern with the study and creation of computer systems that exhibit some form of intelligence as:

- Systems that learn new concepts and tasks - Systems that can reason and draw useful conclusions about the world around us.
- Systems that can understand a natural language or perceive (feel) and comprehend (understand or participate) a visual scene. - Systems that perform other type of feats that require human types of intelligence. Artificial intelligence can be viewed from a variety of perspectives.
- From the perspective of intelligence, AI is making machines "intelligent" acting as we would expect people to act like knowledge, Expert problem solving.
- AI is a set of very powerful tools, and methodologies for using those tools to solve business problems.
- From a programming perspective, AI programs focus on symbols rather than numeric processing, problem solving (achieve goals) and search (BFS, DFS). AI programming languages include: LISP (List Processing), developed in the 1950s and PROLOG (Program Logic) was developed in the 1970s. They are the early programming language strongly associated with AI. Artificial Intelligence is a new electronic machine that stores large amount of information and process it at very high speed. AI requires an understanding of related terms such as intelligence, knowledge.

The Importance of AI:

AI may be one of the most important developments of this century. Many countries have focus on importance of AI and make a plan to development for research work in AI and for this they have passed budget like Japanese were first announced fifth generation computer in October 1981 with budget of about one billion dollars and produce systems that can converse a natural language, understand speech and visual scenes, learn and refine their knowledge, make decisions and exhibit other human traits.

Following Japanese other countries plan to some form of AI program. British initiated a plan called Alvey Project with respectable project. The European Common Market countries have jointly initiated a plan called ESPRIT program. Other countries also initiated for AI research and development plans as French, Canada, Soviet Union, Italy, Austria, Irish Republic and Singapore. The United State push forward in AI research. First in 1983 there was formation of consortium known as Microelectronics and computer technology corporation (MCC) headquartered in Austin, Texas.

It develop advanced technologies that apply AI techniques like VLSI. Second development of DARPA (Defense Advanced Research Projects Agency) has increase AI research, including development support in three significant programs: 1) Development of an Autonomous land vehicle (ALV) – driverless military vehicle. 2) Development of pilot's associate- an Expert system which provides assistance

to fighter pilots. 3) The strategic Computing program- an AI based military supercomputer project.

Early work in AI:

- Early 1936: Alan Turing, sometimes regarded as the father of AI. He had demonstrated a simple computer processor (also called Turing machine) that manipulated symbols as well as numbers.
- 1952-1955: Chess playing programs developed by researchers like Claude Shannon at MIT and Allen Newell at RAND corporation (1972). Mid 1950 is the official birth of AI.
- 1956-57: Logic Theorist, First automatic theorem proving program by Newell, Shaw and Simon. List Processing language also developed.
- 1961-65: A.L. Samuel developed a program which learned to play checkers at a master level. 1965: J.A. Robinson introduce resolution as an inference method in logic.
- 1965: Work on DENDRAL (First knowledge based expert system based on molecular structure) was begun at Stanford University by J.Lederberg.
- 1968: Work on MACSYMA (Intractive program to solve mathematical problem) was initiated at MIT by Carl Engleman.

2. Core Concepts of Artificial Intelligence

1) Machine Learning (ML)

Machine Learning is a subset of AI that enables systems to learn from data and improve performance without explicit programming.

- Identifies patterns and relationships from data.
- Improves predictions and decisions through experience.
- Powers applications like recommendation and prediction systems.

2) Generative AI

Generative AI focuses on creating new content such as text, images, audio, and videos using learned patterns from large datasets.

- Generates original content instead of only analyzing data.
- Learns patterns from massive datasets for content creation.
- Used in chatbots, image generation, and content writing tools.

Natural Language Processing:

NLP is the branch of computer science focused on developing systems that allow computers to communicate with people using everyday language. It is also called Computational Linguistics. - NLP is a sub field of AI which deals with the methods of communicating with a computer in once on natural language. It includes understanding and generation as well as other task such as multi lingual translation. - Natural languages are used by humans for communication. They are distinctly different from formal languages, such as C++, Java, and PROLOG because they are not ambiguous. - A system that can work with one human language cannot necessarily deal with any other human language.

Advantages of NLP:

NLP minimizes many hardships a person's faces while communicating with the computer.

- 1) One need not be a computer literate to communicate with it.
- 2) One can dispose of special query languages like SQL, which presently humans use to access information from databases.
- 3) Information generated worldwide daily from various sources and presented in news papers, magazines and written material can be condensed and presented to the user in a capsule form.
- 4) There is a human touch in the NLP systems. One feels at home by directly communicating with the machine.
- 5) NLP system when coupled with speech recognition and synthesis system is certain to give the humans a shot in the arm.

Major Problem with NLP program:

Developing programs that understand a natural language is a difficult problem. - Natural Languages are large. They contain an infinite number of different sentences; new ones can always be produced. - Also, there is much ambiguity in a natural language. Many words have several meanings such as can, bear, fly and orange and sentences can have different meanings in different context. This makes the creation of programs that "Understand" a natural language, one of the most challenging tasks in AI.

Other Problems with NLP:

NLP requires the system to analyze the sentence and retrieve the correct meaning. Ambiguity of the words used and their meaning in their respective context are the major bottle necks in NLP.

Following will explain this-

- 1) Words used by one set of people could have different meaning for a different set of people. Eg. "This flat is terrible," to an Englishman flat means house while for American it is a puncture.
- 2) The functional structure of the sentence itself can give arise to ambiguities. E.g. "I saw taj Mahal flying over Agra.", who is flying taj mahal or the person who spoke the sentence.
- 3) Extensive use of pronoun increases ambiguities. E.g. "Ravi went to the supermarket. He found his favorite brand of coffee powder in rack five. He paid for it and left. The question is- To what object the pronoun "It" refers to, the supermarket or the coffee powder or rack five?
- 4) Conjunction used in Natural Language to avoid repeating of phrases also cause NLP problems. E.g. Ram and Shyam went to a restaurant. While Ram had a cup of coffee and Shyam had tea. In the sentence, we have suppressed the term "Had a cup of" for Shyam but the meaning as well understood by humans while it might be difficult for the machine.
- 5) Ellipsis is a major problems with a NLP systems finds difficult to manage. In ellipsis, one does not state some words but leaves it to the audience to fill it up. Eg. "What is length of river Gangas? Of river kaveri? "Because of these five problems, we find it difficult to build NLP systems.

3. Applications of AI

AI has applications in all fields of human study, such as finance and economics, environmental engineering, chemistry, computer science, and so on.

Some of the applications of AI are listed below:

Perception

- Machine vision
- Speech understanding
- Touch (tactile or haptic) sensation
- Robotics
- Natural Language Processing
- Natural Language Understanding
- Speech Understanding
- Language Generation
- Machine Translation
- Planning

Expert Systems

- Machine Learning
- Theorem Proving
- Symbolic Mathematics
- Game Playing

Working step of AI:

- 1) Data Collection: AI systems rely on large sets of data which could include images, text or sensor readings. For example, teaching an AI to recognize cats, we collect a dataset of labeled cat images.
- 2) Processing and Learning: It uses algorithms to analyze data and identify patterns. For example, it learns to recognize key features like a cat's shape, ears or whiskers helping it understand the data.
- 3) Model Training: The AI model is trained using the data, adjusting its internal settings to improve its predictions. With more data, the model becomes more accurate and better at recognizing new examples like unseen images of cats.
- 4) Decision Making: Once trained, it can use what it has learned to make decisions. For example, it can find whether a new image contains a cat based on the patterns it learned during training.
- 5) Feedback and Improvement: It can improve through feedback, especially in methods like reinforcement learning. In this case, the AI receives rewards or penalties, refining its ability to make better decisions over time.

4. Types of Artificial Intelligence

AI can be classified into two main categories based on its capabilities and functionalities.

1) Based on Capabilities

- Narrow AI: Designed to perform specific tasks such as speech recognition or recommendation systems.
- General AI: A theoretical AI capable of performing human-like intellectual tasks across multiple domains.
- Superintelligent AI: A hypothetical AI that would surpass human intelligence in reasoning and decision-making.

2) Based on Functionalities

- Reactive Machines: AI systems that respond only to current inputs without storing past experiences.
- Limited Memory: AI systems that use past data and observations to improve future decisions.
- Theory of Mind: A theoretical AI that could understand human emotions, beliefs, and intentions.
- Self-Aware AI: A hypothetical AI with consciousness and awareness of its own existence.

5. AI Models

AI models are systems that learn from data or predefined rules to make predictions and decisions. Different models use different learning approaches depending on the type of training data and feedback available.

1) Supervised Learning Models

- In supervised learning, AI is trained on labeled data with clear input-output pairs to learn the relationship between them.
- Reduces prediction errors during training.
- Used in image classification, spam filtering, and medical diagnosis.

2) Unsupervised Learning Models

- In unsupervised learning, AI works with unlabeled data to identify hidden patterns, trends, or groupings automatically.
- Helps discover structures within complex datasets.
- Used in clustering, customer segmentation, and fraud detection.

3) Reinforcement Learning Models

- In reinforcement learning, AI learns by interacting with an environment using rewards and penalties as feedback.
- Optimizes decisions through trial and error.
- Used in robotics, gaming, and autonomous systems.

6. Uses of Artificial Intelligence in Everyday Life

Artificial Intelligence (AI) is changing the way we live, work, and interact in many areas. It helps machines learn, think, and make decisions, improving efficiency, personalisation, and creativity. From virtual assistants to self-driving cars, AI is making a big difference. Below, we look at 10 real-life examples of how AI is transforming different industries, with a focus on new trends that are emerging.



1) Virtual Assistants

They are AI-powered tools that help in managing everyday tasks and providing users with hands-free assistance. They are used in this:

- Tools: Amazon Alexa, Apple Siri, Google Assistant, Microsoft Cortana
- Task Management: They help users to schedule appointments, send messages and set reminders for making our life more easier.
- Smart Home Integration: These assistants connect with smart home devices, lights and helps in sending messages.
- Personalization: They learn user preferences with time and offers personalized suggestions.
- Voice Interaction: Users can control their devices and access information just by speaking which is making the tools efficient and accessible.

2) Language Translation

AI translation tools helps people in the world to communicate easily as it is breaking down language issues. Here's how language translation tools works:

- Tools: Google Translate, DeepL, Microsoft Translator
- Real-Time Translation: It translate text, speech and images helping in better communication across different languages.
- Contextual Accuracy: These tools adapt themselves by learning from new data and ensuring translations are more accurate.
- Global Communication: Enables seamless communication for business, travel and personal purposes in the world.
- Accessibility: Language translation tools have become necessary for travelers as it helps them to navigate foreign places easily.

3) Education

AI is changing education sector by offering personalized learning experiences and automating administrative tasks. Lets see how it helps students and teachers.

- Tools: Coursera, Khan Academy, Duolingo, Quizlet
- Adaptive Learning: Platforms adjust content and lessons based on individual student performance and ensures personalized learning experiences.
- Automated Grading and Feedback: Saves time by checking assignments and offering instant feedback to students.
- Tutoring Assistance: It helps students with one-on-one tutoring in the areas where they struggle.
- Classroom Insights: Teachers can analyze performance data to identify areas where students need extra help.

4) Autonomous Vehicles

Self-driving vehicles are changing the transportation system and also it plays a important role in the navigation and decision-making processes of these vehicles.

- Tools: Tesla Autopilot, Waymo, Uber ATG, Cruise
- Navigation and Decision-Making: Vehicles use sensors and algorithms to understand and find roads, detecting objects and obstacles.
- Safety Improvements: This technology helps in reducing accidents caused by human error which makes our travel more safer.

- Traffic Optimization: Autonomous cars communicate with each other to reduce traffic and improve fuel efficiency.
- Future of Transport: These vehicles are more efficient and accessible in the terms of transportation as they are including in delivery and public transport.

5) Healthcare Diagnostics

It is helping doctors to diagnose diseases more quickly and accurately. Lets see how AI tools are used in medical diagnostics.

- Tools: Zebra Medical Vision, Aidoc, PathAI, Arterys
- Medical Imaging Analysis: They process medical images like X-rays and MRIs to detect diseases early.
- Personalized Treatment: Stores patient data and offers personalized treatment plans for our needs.
- Predicting Health Risks: Can predict future health risks by analyzing patterns in patient data.
- Efficiency: These tools increases the speed of diagnostics and reduces wait times and improving patient outcomes.

6) Retail

In retail AI enhance customer experiences, manage inventory and personalize marketing efforts. Here's how AI is transforming retail industry.

- Tools: Shopify, Magento, BigCommerce, Square
- Product Recommendations: AI analyzes customer behavior and suggests products based on past purchases.
- Dynamic Pricing: It adjusts prices in real-time, based on market trends and competitor analysis.
- Inventory Management: Also helps in tracking stock levels and manage restocking, improving operational efficiency.
- Customer Support: It handles common customer queries after providing 24/7 support.

7) Finance and Banking

AI plays an important role in making finance and banking services more efficient and secure. Lets see how AI tools are used in this sector.

- Tools: Robinhood, Mint, PayPal, Stripe
- Algorithmic Trading: These algorithms helps in analyzing market data and make real-time trading decisions.
- Fraud Detection: AI monitors financial transactions to detect suspicious activity and prevent fraud.
- Customer Service: Also chatbots answer customer questions and helps in assisting with transactions.
- Personalized Financial Advice: AI-driven platforms provide investment advices and helps individuals to manage their finances.

8) Smart Home Devices

Smart home devices using AI are becoming a common feature in our homes. These devices automate tasks and optimize energy use for enhanced convenience and security.

- Tools: Nest Thermostat, Philips Hue, Ring Security, Google Nest
- Automation: Devices like thermostats and lights can adjust automatically based on user behavior.
- Energy Efficiency: Using AI we can save electricity costs while maintaining comfort.
- Home Security: AI-powered cameras and sensors detect unusual activity and send real-time alerts to homeowners.

- Personalized Control: Devices learn user preferences and adapt to improve over time.

9) Robotics

AI-powered robots are used in the industries like manufacturing, healthcare and agriculture. They helps in performing tasks easily and efficiently.

- Tools: Boston Dynamics Spot, iRobot Roomba, DJI Tello, Kuka Robotics
- Manufacturing: It can automate tasks which improves productivity and accuracy.
- Healthcare: It helps with complex procedures, improves accuracy and reduces human error.
- Agriculture: Robots in farming help with tasks like harvesting, planting and watering crops.
- Exploration: They are used in environments that are hazardous for humans.

10) Gaming and Entertainment

AI is upgrading gaming and entertainment industry by creating more engaging, personalized experiences for users.

- Tools: Unity, Unreal Engine, Oculus VR, Steam
- Dynamic Gameplay: It can adjusts difficulty of games based on player performance also ensures an engaging experience.
- Content Generation: It helps in creating game levels, characters and storylines which helps in speeding up game development and offers variations.
- Smarter NPCs: It helps in making non-playable characters (NPCs) which behaves like a human and reacts to player actions in a natural way.
- Immersive Experiences: In virtual reality (VR) and augmented reality (AR), it adapts environments in real time to provide a better experience.

7. AI Tools Currently in use Around the World

Globally, AI tools are used for a wide range of tasks, from general-purpose chatbots to highly specialized applications. The market is led by companies in the United States and China, which have developed their own ecosystems of AI models and products.

General-Purpose AI Tools

These are the most common AI tools used by individuals and businesses for a variety of tasks:

- ChatGPT: An AI assistant from OpenAI that can understand and generate text, images, and other forms of media. It's widely used for writing, coding, brainstorming, and research.
- Google Gemini: A large language model (LLM) from Google that powers various applications, including a conversational chatbot and features in Google products.
- Microsoft Copilot: An AI assistant integrated into Microsoft 365, Windows, and the Bing search engine, designed to assist with tasks like writing documents, creating presentations, and summarizing emails.
- Adobe Firefly: A generative AI tool for creating images and text effects, integrated into Adobe's creative suite.
- Grammarly: An AI-powered writing assistant that checks for grammar, spelling, and style, helping users improve their writing.

8. Conclusion

Artificial Intelligence is no longer just a futuristic idea; it's actively improving many areas of our lives. From making tasks easier with virtual assistants to improving healthcare with better diagnostics, AI is making a big impact. As AI continues to evolve, with advances like language translation and robotics, it holds the potential to solve global problems and enhance our lives. With responsible development and fair access, AI can help create a smarter, more connected, and inclusive future for everyone.

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