**ASSIGNMENT SUBMITTED**

**BY**

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**COURSE TITLE: ARTIFICIAL INTELLIGENCE**

**ASSIGNMENT II**

**SECOND ASSIGNMENT**

**QUESTION 1.**

1. Compare and contrast augmented intelligence and Artificial intelligence

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| **S/N** | **Augmented Intelligence** | **Artificial Intelligence** |
| 1 | Artificial Intelligence (AI): AI refers to systems or machines designed to perform tasks that would typically require human intelligence. These tasks include reasoning, learning, perception, and decision-making. AI can operate autonomously and independently. | Augmented Intelligence: Augmented Intelligence emphasizes the partnership between humans and machines, where AI tools enhance human capabilities rather than replace them. It focuses on supporting human decision-making through AI-driven insights and recommendations. |
| 2 | The goal of AI is to automate tasks, potentially without human intervention, and to simulate human intelligence. It often focuses on creating systems that can function autonomously or with minimal human input. | The purpose of Augmented Intelligence is to enhance human abilities, providing insights, recommendations, and decision-making support. It aims to create a symbiotic relationship where AI complements human judgment and expertise. |
| 3 | AI systems, particularly machine learning models and deep learning networks, are designed to learn, adapt, and make decisions without the need for human guidance. The goal can be full autonomy (e.g., self-driving cars). | Augmented Intelligence: Augmented Intelligence systems are more collaborative. They often require human interaction and oversight. The AI provides insights, but humans make the final decisions or perform the creative aspects of the task. |
| 4 | Humans in AI systems typically design, train, and set parameters, but the system can operate largely without human intervention after deployment. | Humans play an active role in interpreting and acting upon AI-driven insights. The machine helps the human, but the human still makes the final decisions, often using AI as a tool to improve performance. |
| 5 | AI is used in areas like automation (e.g., robotics), autonomous vehicles, facial recognition, natural language processing, and data-driven decision-making without significant human oversight. | Augmented Intelligence is used in sectors like healthcare (e.g., AI assists doctors in diagnosing diseases), finance (e.g., AI provides insights for investment decisions), and customer service (e.g., AI helps agents respond more effectively). |
| 6 | AI typically works independently, with minimal or no human intervention, except for initial design and training. | Augmented Intelligence thrives on continuous human-machine interaction. The AI assists, advises, and augments human work, making it more of a collaborative process. |
| 7 | AI systems can raise concerns around ethics and control, especially in fully autonomous systems. Decisions made by AI might be harder to understand, and there is a risk of bias in AI systems. | Augmented Intelligence generally provides humans with more control and oversight, making it easier to address ethical concerns, such as bias in AI recommendations. The human is responsible for the final decision. |
| 8 | Artificial Intelligence focuses on machines performing tasks autonomously, often without human input, whereas Augmented Intelligence focuses on improving human decision-making by using AI as a supportive tool. | Augmented Intelligence is often considered a more human-centric approach within the broader realm of AI. |

**QUESTION** **2.**

**History of AI from 1940 till date**

The history of artificial intelligence (AI) spans several decades of research and development. Here is a broad overview from 1940 to the present day:

**1940s - The Early Foundations**

Alan Turing: Often considered the father of modern AI, Turing introduced the idea of a machine that could simulate human intelligence. In 1936, he developed the concept of the Turing Machine, which became foundational for computation. In 1950, Turing published his famous paper "Computing Machinery and Intelligence," proposing the Turing Test as a way to measure a machine's ability to exhibit intelligent behavior.

**John Von Neumann**: Developed the Von Neumann architecture, a foundational model for computer design, which influenced the development of AI by providing a practical framework for computing systems.

**1950s - Birth of AI as a Field**

1956 - Dartmouth Conference: The term "artificial intelligence" was coined by John McCarthy, Marvin Minsky, Nathaniel Rochester, and Claude Shannon at the Dartmouth Summer Research Project on Artificial Intelligence. This is considered the birth of AI as a formal academic field.

Early work in AI focused on symbolic reasoning, logic, and the creation of algorithms to solve specific problems. Alan Newell and Herbert A. Simon created the Logic Theorist (1955), a program that proved mathematical theorems, regarded as one of the first AI programs.

**1960s - Early Progress and Optimism**

**Joseph Weizenbaum's ELIZA (1966):** A natural language processing program that simulated a conversation, one of the first examples of a machine attempting human-like interaction.

**Shakey the Robot:** Developed by the Stanford Research Institute in the late 1960s, Shakey was one of the first robots capable of reasoning and moving in a structured environment.

**Perceptron (1960s):** Early neural network models like the Perceptron, developed by Frank Rosenblatt, showed that machines could learn simple patterns but were limited in scope.

**1970s - Expert Systems and AI Winters**

Expert Systems: In the 1970s, expert systems like MYCIN were developed to mimic the decision-making abilities of a human expert in specific domains, such as medicine. These systems were based on if-then rules. AI Winter: Despite some progress, AI research faced challenges, particularly in dealing with complexity. This led to periods of reduced funding and interest, known as AI winters.

**1980s - Knowledge-Based Systems and Neural Networks**

Rise of Expert Systems: In the 1980s, expert systems saw commercial success, and many companies adopted them for problem-solving in various industries.

**Backpropagation in Neural Networks**: Geoffrey Hinton, David Rumelhart, and Ronald J. Williams revived interest in neural networks by introducing the backpropagation algorithm, which allowed for more efficient training of multi-layer neural networks.

**AI Winter II**: Despite some advances, neural networks faced challenges, and the hype around AI diminished again.

**1990s - Machine Learning and Computational Power**

IBM's Deep Blue: In 1997, Deep Blue, a computer developed by IBM, famously defeated world chess champion Garry Kasparov, showcasing the power of AI in specific domains.

**Machine Learning**: The 1990s saw increased interest in machine learning, where algorithms were designed to improve over time with exposure to data. Algorithms like decision trees, support vector machines, and k-nearest neighbors became popular.

The Internet and Data: The rise of the internet led to a boom in data availability, providing more opportunities for training machine learning models.

**2000s - Big Data, the Rise of Deep Learning**

Improved Computational Power: Increased computational power, especially with GPUs (graphics processing units), allowed for more complex models to be trained.

**Deep Learning**: In the 2000s, researchers like Geoffrey Hinton, Yoshua Bengio, and Yann LeCun revitalized the field of deep learning, specifically focusing on neural networks with many layers (deep neural networks), which had previously been difficult to train effectively.

AI in Search Engines: Companies like Google began using AI to improve search algorithms, enhancing results based on user preferences and behaviors.

**2010s - The AI Revolution**

Breakthroughs in Deep Learning: In 2012, AlexNet, a deep neural network developed by Alex Krizhevsky, Ilya Sutskever, and Geoffrey Hinton, won the ImageNet competition by a significant margin, sparking a revolution in computer vision and deep learning.

**Natural Language Processing (NLP):** Models like Word2Vec (2013) and Google’s BERT (2018) advanced NLP by representing words as vectors and improving understanding of context in language.

**Self-Driving Cars**: Companies like Tesla, Google's Waymo, and Uber began developing and testing self-driving vehicles using AI, machine learning, and sensor technology.

**AlphaGo**: In 2016, Google's DeepMind developed AlphaGo, which defeated the world champion Go player, Lee Sedol, a major milestone in AI’s ability to master complex games.

**2020s - AI Everywhere**

Generative AI: AI models capable of generating new content, such as images, text, and music, gained significant attention. Notable examples include GPT-3 (2020) by Open AI, capable of generating human-like text and answering a wide range of queries.

**AI in Healthcare**: AI started playing a more significant role in drug discovery, diagnostics, and medical imaging, helping to detect diseases such as cancer and COVID-19.

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Ethics and Regulation: As AI became more prevalent, concerns over ethics, bias, and fairness emerged. Organizations and governments began considering regulations to ensure the responsible development and deployment of AI.

**AI in Creativity:** AI tools were used in music composition, writing, design, and other creative fields, with models like DALL-E for image generation and ChatGPT for text-based applications.

**GPT-4 (2023):** OpenAI released GPT-4, a more advanced version of its language model, with improved capabilities in reasoning, creativity, and problem-solving.

**Present and Future**

**Integration with Daily Life**: AI is integrated into everyday technologies, from virtual assistants like Siri and Alexa to predictive analytics in finance, entertainment, and retail.

**AI in Art and Creativity:** AI-driven systems are being used for generating images, music, and even writing entire books or movies, sparking new discussions about creativity and authorship in the age of AI.

**Challenges:** Ongoing challenges include addressing biases in AI models, creating explainable AI, managing privacy concerns, and ensuring that AI development benefits society as a whole.

The development of AI continues at a rapid pace, with ongoing advancements in areas such as quantum computing, reinforcement learning, autonomous systems, and general AI. Researchers are striving for AI systems that can learn more like humans, adapt to new environments, and handle more complex tasks