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The Impact of Artificial Intelligence (AI) on Human Intelligence (HUMINT): A Blessing or a Curse?

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Abstract

Machine learning and artificial intelligence are two rapidly developing areas of computer science that are profoundly altering how people interact with technology. While artificial intelligence aims to create intelligent computers that can mimic human cognition and behavior, machine learning is an application of artificial intelligence that allows machines to learn from data without being explicitly programmed. As artificial intelligence continues to evolve, it is becoming increasingly clear that we are on the cusp of a paradigm shift that could fundamentally transform the nature of human intelligence. In this groundbreaking research paper, we have delved into the potential risks and dangers posed by the increasing dominance of artificial intelligence on human intelligence. By analyzing the ubiquitous use of artificial intelligence in our daily lives, from virtual assistants and smartphones to predictive algorithms and self-driving cars, we have revealed the ways in which artificial intelligence is already affecting our thinking abilities and working capacity. Through our research, we have uncovered the various ways in which the accelerating pace of artificial intelligence development could soon surpass human intelligence, leading to a world where humans are entirely dependent on machines for even the most basic tasks. Our study has identified the grave risks associated with this scenario, including potential job displacement, loss of autonomy, and the erosion of critical thinking skills. However, our research has also revealed a path forward. By understanding the potential risks of artificial intelligence and developing strategies to mitigate them, we can build a future that ensures humans remain the masters of their own fate. Overall, this research paper represents a significant contribution to the field of artificial intelligence and human intelligence, offering critical insights into the potential dangers and opportunities of this rapidly evolving technology. By heeding the lessons of this research, we can create a future where humans and machines coexist in harmony, ensuring a brighter future for all.

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INTRODUCTION

People today are continuously looking for ways to finish the things they are working on that are quicker, simpler, more efficient, and convenient. Because growth must continue, people are constantly looking for new and better ways to do tasks. The catalyst for human progress is inventiveness, the making of new things [1].

The words “artificial” and “intelligence” are the building blocks of artificial intelligence (AI); “artificial” denotes something that is “man-made,”

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while “intelligent” denotes something that has “thinking power.” In the current world, technology is developing swiftly, and we encounter new breakthroughs every day. Through the creation of intelligent machines, one of the computer science disciplines that is currently undergoing tremendous growth is poised to bring in a new era of technological advancement. In today’s world, AI is everywhere. In 2022, AI became widely used thanks to substantial use of applications of the Generative Pre-Training Transformer. Chat GPT by Open AI is the program that is utilized the most.

Machine learning (ML) is an area of AI that aims to create systems that can learn from prior data, detect patterns, and draw logical conclusions with little to no human intervention. Computers may now learn on their own from historical data thanks to a new technological innovation called ML. On the basis of previously obtained data or information, ML uses a range of techniques to build mathematical models and make predictions. Right now, it is utilized for different purposes, for example, recommender frameworks, email sifting, Facebook auto-labeling, picture ID, and discourse acknowledgment [2].

Many facets of society, such as access to healthcare, education, and productivity, have the potential to be dramatically improved by AI and ML. AI-driven technology can also help with problem-solving and make our daily lives more convenient and easy. However, it also negatively affects human life. The AI grows to be so strong that it is capable of programming itself to rule and defying its master's commands [3].

We should all pause for a second and concentrate on improving and advancing AI while simultaneously thinking about how to advance mankind [4].

HISTORY OF AI AND ML

Here is a quick timeline showing how AI has changed over the past 60 years since it was first developed.

In 1956, John McCarthy coined the term “artificial intelligence” and hosted the first AI conference.

The first versatile mobile robot, Shakey, was created in 1969. It is now capable of acting in line with a strategy rather than just a list of commands.

1997 saw the creation of the supercomputer “Deep Blue,” which competed against the world chess champion and won. By building this enormous computer, IBM achieved a significant milestone.

The first robotic hoover cleaner that was a commercial success was created in 2002.

Between 2005 and 2019, numerous advancements were produced, including speech recognition, robotic process automation (RPA), a dancing robot, smart homes, and more [5].

The Linear Fold AI algorithm is made available by Baidu to research teams in the early stages of the COVID-19 pandemic in 2020. The programme is 120 times faster than earlier techniques and can predict the RNA sequence of a virus in just 27 seconds.

TYPES OF AI AND ML

- Reactive AI: Operates based on current data, performs predefined tasks without forming inferences or considering past experiences. Example: IBM Chess program.
- Limited memory AI: Uses past data stored in temporary memory to make informed decisions. Example: Self-driving cars using recent data to improve driving decisions.
- Theory of mind AI: Advanced AI focusing on understanding human thoughts and beliefs, incorporating emotional intelligence. Still under development.
- Self-aware AI: Speculative type with consciousness and self-awareness. Considered a distant possibility with potential future implications (see Figure 1).

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- Supervised learning: Learns from labeled data to make accurate predictions or classifications. Example: Cortana, a voice assistant.
- Unsupervised learning: Discovers patterns or structures in unlabeled data, identifies clusters or relationships.
- Reinforcement learning: Learns through trial and error, receives rewards or penalties for actions taken (see Figure 2).

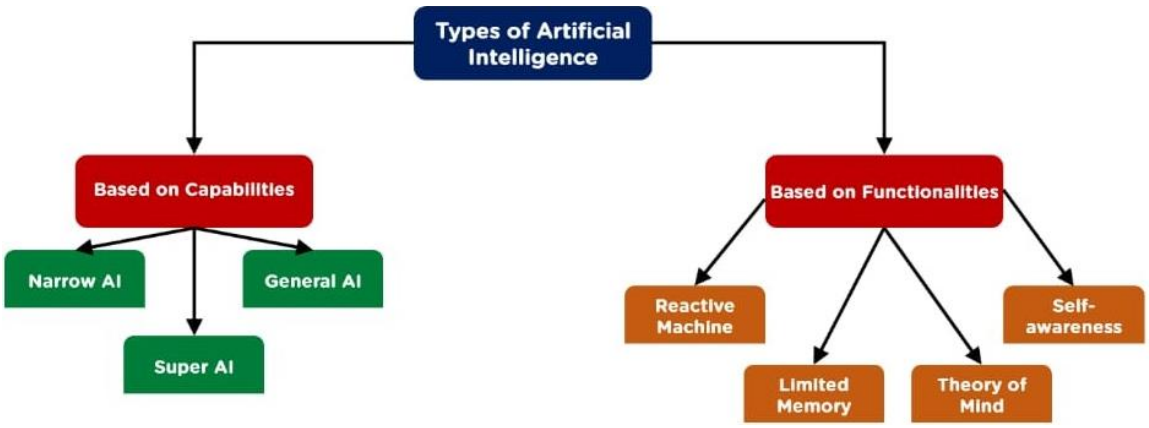

Figure 1. Types of artificial intelligence [6].

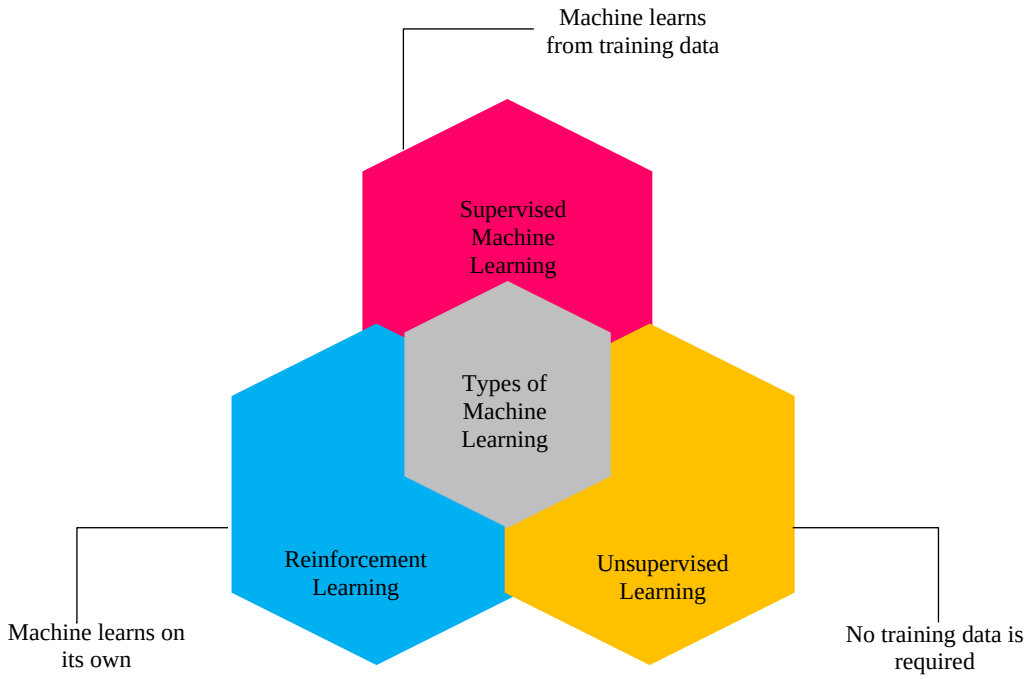

Figure 2. Types of machine learning [7].

APPLICATIONS OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Applications of AI

Catalyzing revolutionary advancements in efficiency, decision making, customer service, and creativity. In the dynamic realm of technology, AI has emerged as an awe-inspiring game-changer, propelling us into a new era of work and interaction. This extraordinary technology has brought about a paradigm shift by magnifying efficiency, enabling astute decision-making, enhancing customer service, and fostering unparalleled creativity and innovation. Let us delve deeper into each of these domains to witness the awe-inspiring capabilities that AI possesses.

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Unleashing Unprecedented Efficiency and Productivity

Envision a world where mundane and repetitive tasks are seamlessly managed, liberating humans to dedicate their time and energy to high-value endeavors. AI has materialized this vision. Through intelligent automation, AI effortlessly handles laborious chores such as scheduling meetings, managing emails, and streamlining workflows. Powered by AI, virtual assistants effortlessly tackle administrative tasks, freeing professionals from the constraints of repetitive work. This newfound efficiency not only amplifies productivity but also unleashes human potential to tackle complex challenges and embark on innovative ventures.

Empowering Decision-Makers with Unrivaled Insights:

In the contemporary business landscape, data reigns supreme, and AI serves as the key to unlock its immense potential. With its extraordinary data processing capabilities, AI empowers decision-makers with unparalleled and dependable insights that were previously unimaginable. By harnessing AI-based solutions for data analysis, organizations can extract valuable information, discern patterns, and unveil hidden correlations from vast datasets. Equipped with these data-driven insights, leaders can make informed decisions, optimize operations, identify emerging trends, and seize strategic opportunities. The era of intuition-driven decisions is now complemented by AI-powered precision, revolutionizing the business landscape.

Elevating Customer Service to Unprecedented Heights:

The advancement of customer service has been fueled by AI, taking it to unheard-of heights. AI-powered chatbots and virtual assistants are widely used, revolutionizing how businesses interact with their customers. These intelligent systems have evolved into exceptional customer service champions, adept at understanding and addressing customer needs. Through advancements in Natural Language Processing, chatbots can comprehend complex queries, provide real-time support, and offer tailored solutions. The 24/7 availability of AI-driven customer service tools ensures that businesses can deliver seamless, personalized assistance, thereby augmenting customer satisfaction and fostering unwavering loyalty.

Unleashing Limitless Creativity and Innovation:

AI's capabilities transcend mere efficiency and decision-making; it has the power to ignite creativity and inspire innovation. By augmenting human intelligence, AI systems become catalysts for ideation, enabling groundbreaking discoveries and fresh approaches. Through sophisticated algorithms, AI can analyze vast reservoirs of data, encompassing consumer preferences, market trends, and existing content, to unveil hidden patterns and generate novel ideas. Prominent corporations already harness AI-powered content writing bots, providing their writers with aggregated, precise information and expanding their creative horizons. This symbiosis between humans and AI propels creative processes to unprecedented heights, igniting innovation and pushing the boundaries of content quality.

We must address the ethical issues and difficulties that AI offers while we embrace its potential. Safeguarding data privacy, mitigating bias, and ensuring human oversight are essential elements to address in our pursuit of responsible AI implementation.

In conclusion, AI stands as an indomitable force, reshaping industries and redefining our world. With its capacity to revolutionize efficiency, decision-making, customer service, and creativity, AI has become an indispensable ally in our quest for progress. Embrace this transformative technology and unlock a future where human ingenuity and AI harmoniously merge to redefine the limits of possibility.

APPLICATIONS OF ML

ML, the cutting-edge technology of our time, is undergoing an explosive growth that continues to captivate the world. Its pervasive presence in our daily lives, often unbeknownst to us, is exemplified by the likes of Google Maps, Google Assistant, and Alexa. Now, prepare to be astounded by an array of the most astonishing real-world applications of ML:

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Unveiling the Secrets of Images

Delving into the realm of image recognition, ML shines brightly. This application empowers us to identify objects, individuals, locations, and even digital images. One particularly fascinating example is automatic friend tagging suggestions on Facebook. When we upload a photo with friends, ML's face detection and recognition algorithms come to life, presenting us with tagging suggestions. Behind the scenes lies Facebook's remarkable project, "Deep Face," responsible for identifying faces and matching them to their owners.

The Power of Speech

Enter the captivating realm of speech recognition, epitomized by Google's "Search by Voice" feature. Here, ML algorithms take center stage, converting spoken instructions into text, thereby opening doors to a world of possibilities. Tech giants such as Google Assistant, Siri, Cortana, and Alexa harness the prowess of speech recognition to effortlessly follow voice commands.

Mastering Traffic Prediction

Prepare to be enthralled by the wonders of traffic prediction, exemplified by the indispensable Google Maps. This innovative application not only shows us the optimal route but also predicts traffic conditions. Leveraging real-time vehicle locations from the Google Maps app, combined with historical data on past traffic patterns, this technology ensures a seamless navigation experience. The collective input of Google Maps users continually enhances its performance, with valuable information feeding into its ever-improving database.

Tailoring Recommendations

In the realm of e-commerce and entertainment, ML takes center stage in personalized product recommendations. ML is used by industry giants like Netflix and Amazon to offer products and content based on customer preferences. When we search for a product on Amazon, we subsequently encounter tailored advertisements during our internet browsing. Similarly, Netflix employs ML to provide personalized recommendations for entertainment series, movies, and more.

Defending Against Email Threats

ML lends its capabilities to shield us from the perils of email spam and malware. As our inboxes receive new emails, ML algorithms automatically filter them, sorting them into important, normal, or spam categories. For example, Gmail uses a number of spam filters, such as content filters, header filters, general blacklists, rules-based filters, and permission filters. These filters employ ML algorithms such as Multi-Layer Perceptron, Decision Trees, and Naïve Bayes classifiers, effectively detecting spam and safeguarding us from potential malware threats.

Virtual Personal Assistants

Enter the world of virtual personal assistants like Siri, Alexa, Cortana, and Google Assistant. These remarkable AI companions dutifully respond to our voice instructions, assisting us in a multitude of tasks such as playing music, making calls, opening emails, and scheduling appointments. ML algorithms serve as the backbone of these assistants, recording and deciphering our voice instructions on cloud-based servers to deliver seamless experiences.

Battling Online Fraud

ML stands as a guardian of our online transactions, ensuring their safety and security by swiftly detecting fraudulent activities. From fake accounts to stolen funds, ML algorithms, such as Feed Forward Neural Networks, scrutinize each transaction, distinguishing genuine ones from fraudulent ones. By discerning patterns unique to genuine transactions and detecting deviations in fraudulent ones, ML fortifies our online transactions, providing heightened security.

These are just a few instances of the amazing abilities of ML. Its potential extends far beyond what can be covered here, promising even more groundbreaking applications that continue to shape.

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DISADVANTAGES OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

According to Stephen Hawking, "The emergence of artificial intelligence could mean the end of the human race" [8]

Below are some enhanced and more impactful concerns associated with AI and ML:

1. *Absence of human judgment:* AI and ML systems heavily rely on data patterns and algorithms, lacking the human intuition and common sense necessary for making nuanced decisions in ambiguous or unfamiliar situations. This can result in flawed or biased outcomes that may not consider the broader context.
2. *Bias in data:* AI and ML models learn from historical data, which can contain inherent biases and reflect societal prejudices. When the training data is biased, these algorithms can perpetuate discriminatory practices, leading to unfair treatment and biased results that mirror the prejudices present in the data.
3. *Potential job displacement:* The remarkable automation capabilities of AI and ML hold the potential to displace jobs, particularly those involving repetitive or routine tasks. This widespread displacement can create socio-economic challenges, necessitating the adaptation of the workforce to new roles and the acquisition of new skills.
4. *Security and privacy risks:* With AI and ML systems handling vast amounts of personal and sensitive data, concerns regarding data breaches, unauthorized access, and privacy violations come to the forefront. Safeguarding data and ensuring secure implementations are critical considerations to prevent these risks and protect individuals' privacy.
5. *Explainability issues:* Some AI and ML models, such as deep neural networks, frequently function as "black boxes," making it difficult to comprehend the underlying processes that underlie their particular conclusions. This lack of interpretability creates barriers to trust, accountability, and regulatory compliance, as it becomes difficult to explain the reasoning behind their outputs.
6. *Ethical considerations:* The rise of AI and ML introduces ethical concerns surrounding issues like algorithmic transparency, autonomous decision-making, and the potential for misuse or unintended consequences. Establishing and adhering to robust ethical guidelines and frameworks are crucial to ensure responsible and ethical deployment of AI and ML technologies.
7. *Dependency and overreliance:* Excessive reliance on AI and ML systems without proper validation and human oversight can lead to complacency, reducing critical thinking and decision-making abilities. Blind trust in these technologies can undermine human involvement and overlook important contextual factors, potentially leading to errors or unintended consequences.
8. *Limitations in unstructured environments:* AI and ML algorithms may struggle in unstructured or dynamic environments where patterns are not well-defined or where there is a lack of historical data. This limitation hinders their effectiveness in adapting to novel situations, making them less reliable in scenarios that require flexibility and adaptability.

HOW ARTIFICIAL INTELLIGENCE IS DOMINATING HUMAN INTELLIGENCE

1. There will be a profound social transformation in the way we live in the human community. Humanity needs to be resourceful to survive, but thanks to AI, we can easily programme a computer to complete a task without ever having to pick up a tool. As AI replaces the requirement for face-to-face interaction for idea exchange, human connection will eventually dwindle. AI will obstruct individuals since it will make personal contact unnecessary for communication.
2. Unemployment is also a problem. Nowadays, many people are getting unemployed due to the growing technology. Today, many vehicle assembly lines are run by machines and robots, which eliminates the need for traditional workers. Since computerized technology may replace human work, store clerks will no longer be required in supermarkets.
3. Once an AI system has been loaded with the necessary algorithms, it can work automatically on its own route without following an instruction from a human controller.

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4. The human creators of AI might design anything with racial prejudice or selfish motivations in order to hurt particular individuals or objects. AI may target specific races or programmed objects to follow out the commands of the programmers to destroy them, resulting in a worldwide disaster.
5. People are feeling less in control of their lives. Code-driven, "black box" tools are automatically given control over important parts of digital life. People don't have any input and don't understand the context of how the technologies operate. They give up their freedom of choice, privacy, and independence because they have no influence over these procedures. This influence will intensify as automated systems proliferate and advance in sophistication.
6. The exploitation of data and surveillance in sophisticated systems is intended to maximize profits or assert dominance. The majority of AI tools are now and will be in the hands of profit-driven businesses or power-hungry governments. The digital systems that make decisions for individuals sometimes lack values and ethics. These networks are interconnected on a global scale and difficult to control.
7. As AI replaces human workers, economic disparities will expand, causing societal unrest. Code-based machine intelligence's efficiency and other financial benefits will continue to disrupt all areas of human labor [9]. While some anticipate the creation of new jobs, others are concerned about significant job losses, expanding economic disparities, and societal unrest, including populist revolutions.
8. Reduction in people's cognitive, social, and survival abilities. Many believe that AI will enhance human capabilities, but others believe the opposite, that people's growing reliance on machine-driven networks would undermine their capacity for independent thought, autonomous action, and successful interpersonal communication.
9. Information weaponization, autonomous weapons, and cybercrime all bring havoc. The rapid development of autonomous military applications and the use of weaponized information, lies, and propaganda to critically destabilize human populations have led some to foresee further disintegration of established sociopolitical institutions and the potential for significant human casualties. Others are concerned about financial systems being accessed by crooks.

By Ray Kurzweil: "By 2029 or thereabouts, AI will match human levels. If you extrapolate that further, say to the year 2045, we will have multiplied our civilization's intelligence by a factor of a billion" [10].

AI progress is directed in the appropriate directions by human-centered AI. Humans and AI can cohabit more peacefully if we concentrate on alleviating the problems that affect us. This will also enable us to work more efficiently, live better lives, and deliver more positive outcomes for humanity. In other words, the emphasis is on people, including a thorough understanding of people, the reasons why this technology is essential for people, and how it will help us (see Figure 3).

MEDICAL FIELD

For instance, a human-centered strategy is essential in the healthcare industry. By pre-examining the patients and handing this information off to the doctor for his or her diagnosis, a human-centered AI could expand the number of patients a doctor can evaluate each day rather than replacing them with robots. By giving doctors improved resources, it will also aid in reducing the rate of misdiagnosis. Eventually, doctors will be able to work more productively and effectively.

BUSINESS

We discovered that when humans and machines collaborate, businesses saw the biggest improvements in performance. Human leadership, teamwork, creativity, and social skills, as well as AI's speed, scalability, and quantitative capabilities, actively complement one other's strengths through such collaborative intelligence. Making jokes, for instance, can be challenging for computers, while analyzing gigabytes of data is a task that is simple for machines but nearly impossible for humans. Both kind of competencies are necessary for business.

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Figure 3. Coexistence of human intelligence and artificial intelligence.

EDUCATION

A "social investment stipend" should be investigated as a feasible tool to guard against the labour saving and job displacement implications of AI and robots. The stipend would be granted to people who devote their time and effort to causes that foster a kind, compassionate, and creative society, such as education, volunteer work, and caregiving.

CONCLUSION

"By handling a lot of the initial labour on challenging problems, AI technologies will help humans free up processing capacity from our own brains, according to Arney. But because we'll still need to manually review the outcomes, these techniques won't be able to replace people anytime soon."

It is important to conclude that ongoing research and development in the field of AI and ML aim to address various challenges. By embracing responsible implementation practices and continuous improvement.

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