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Evaluation of Prospect and Challenges of Artificial Intelligence (AI) and Preparation for Future

Khandakar Akhter Hossain

Department of Naval Architecture and Marine Engineering (NAME), Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh

Email address:
kahossain756@gmail.com

Abstract: Modern technology Artificial intelligence (AI) is a simulation of human intelligence. Through repeated processing and algorithmic training, AI enables computer systems to learn from experience. It becomes smarter with each successful round of data processing since each interaction allows the AI system to test and measure solutions and improve so that it may perform even more miracles. Today, AI is a hot topic, and many disputes have erupted about how it will effect the labor market and when it will be phased out. The general public is concerned that AI will cause many individuals to lose their jobs. On the other hand, some technology enthusiasts believe that it will result in the creation of a plethora of diverse and intriguing occupations. Many experts believe it will have a significant impact on the workplace and many aspects of life in the near future. It is true that AI has the potential to make professions more creative, rewarding, and flexible, resulting in a more creative and skilled economy. However, advanced technologies have a tendency to eliminate more employment than they create, and this trend is likely to continue. There are numerous ideas for how to handle this problem nowadays, and an education and skill development program with a schooling system must be implemented. Because there isn't enough job for everyone in the world, the entire life style and education system must be transformed, as well as every component reorganized to make them more purposeful. It is an analytical study to assess the future prospects and challenges of AI, as well as the global implications, and determine how to prepare ourselves to mitigate such encounter.

Keywords: AI, IoT, ML, Algorithm, Networks, Robot, Singularity

1. Introduction

Artificial intelligence (AI) refers to the emulation of human intellect in machines, particularly computers, to perform activities that typically need human cognitive abilities, such as visual perception, auditory processing, decision-making, and language translation. Sire, developed by Apple, Alexa, created by Amazon, Google Maps, and ChatGPT, an AI model developed by OpenAI, are all prominent instances of artificial intelligence systems that are widely used by individuals every day [1]. Given its efficiency, this task can be accomplished expeditiously, surpassing the capabilities of a human being. In contemporary times, many have come to acknowledge that AI-driven self-driving cars [2] serve as a tangible indication that the advancement of artificial intelligence is rapidly approaching. Consequently, the notion of driverless automobiles, formerly confined to the realm of speculative literature, is now becoming a plausible reality. According to recent research, it has been projected that by the year 2040, the number of autonomous vehicles using artificial intelligence (AI) technology is estimated to reach around 33 million. Conversely, the use of machine learning techniques and software in healthcare has led to the increasing popularity of artificial intelligence (AI) in this domain. Once again, artificial intelligence (AI) is poised to replicate human cognitive powers in the comprehensive examination, assessment, computation, demonstration, and comprehension of intricate physical, medical, mental, and healthcare information. Additionally, AI has the potential to surpass human capacities by offering novel approaches for diagnosing, selecting medications, administering treatments, and preventing diseases [3]. Artificial intelligence (AI) exhibits the capacity of computer systems to derive accurate inferences only from the provided facts. Artificial

intelligence has the capability to analyze the relationships between different categories of clinical data and the final patient outcome [4]. Artificial intelligence (AI) has become pervasive in several aspects of our daily lives, including activities such as online shopping for books, commodities, and electronic home items, as well as making decisions about ticket bookings. Furthermore, AI plays a significant role in determining the outcomes of job applications, loan approvals from financial institutions, and even the healthcare options available for those diagnosed with cancer or other illnesses. Numerous prominent technology corporations, such as Amazon, Facebook, and Microsoft, have established novel research laboratories dedicated to the field of artificial intelligence. It might be argued that the contemporary understanding of software encompasses AI [5]. According to Peter Norvig, the head of research at Google and a prominent figure in the field of machine learning, artificial intelligence (AI) has shown its capability to perform a wide range of valuable tasks. These include accurately categorizing images, comprehending both spoken and written forms of human language, and aiding in the identification of illnesses. One illustrative instance pertains to the contemporary day, wherein the utility of Google Maps for those engaged in travel is mostly attributed to the advancements in artificial intelligence (AI). The use of this technology has facilitated the generation of intricate cartographic representations within significantly reduced timeframes, surpassing the efficiency of any geographical region. In addition, individuals may also depend on applications powered by artificial intelligence (AI) to ensure their safety and enhance their comfort during activities such as cycling, walking, or using public transit. There is a prevailing optimism within the financial industry about the promising prospects of artificial intelligence (AI), with a specific emphasis on its potential applications within the banking sector [6].

Artificial intelligence (AI) is already undergoing a transformative impact on contemporary society. However, a subset of professionals express apprehension over the potential future scenario in which AI may assume global dominance or pose a danger to human employment opportunities. A significant number of individuals have voiced concern over the potential for employment reduction subsequent to the introduction of OpenAI's conversational artificial intelligence system, ChatGPT. Nevertheless, one of the three prominent figures in the field of Artificial Intelligence (AI) has lately expressed a more cautious perspective about concerns around the potential global domination by AI or the occurrence of irreparable job displacements. In a statement reported by the BBC, Professor Yann LeCun, the principal scientist of Meta, expressed his disagreement with academics who see artificial intelligence (AI) as a potential danger to mankind, deeming such concerns as very implausible. According to Mr. LeCun, it is anticipated that computers will surpass human intelligence in the future. Nevertheless, this development is expected to need a considerable amount of time, perhaps spanning many years into the future. In light of the aforementioned considerations, the individual's stance is that those who see AI as a potential threat should simply refrain from its creation. LeCun's statements are in opposition to the viewpoints expressed by other prominent figures in the field of artificial intelligence, such Geoffrey Hinton and Yoshua Bengio, who have characterized AI as being a potential danger to mankind. As to Mr. LeCun's perspective, the notion of artificial intelligence assuming global dominance might be seen as a manifestation of anthropomorphic tendencies projected onto machines. According to Mr. LeCun, it would be a significant error to restrict access to AI research [7].' As per the Meta scientist, those who voice apprehensions about the potential of future robots to operate at or above human-level capacities are specifically alluding to artificial general intelligence (AGI) systems that possess the ability to effectively address a diverse array of difficulties, akin to human cognitive skills. The speaker placed significant emphasis on the gradual pace of AGI growth, aiming to ultimately attain a degree of intelligence comparable to that shown by the brain of a rat. LeCun also conveyed to the BBC that artificial intelligence (AI) is not anticipated to result in a significant and enduring displacement of individuals from employment. However, the nature of labor is expected to undergo significant changes in the next two decades, since it is still uncertain what the most notable occupations will be during that time period. It is imperative that we adequately equip ourselves to confront forthcoming difficulties.

AI technology has emerged as a significant and more integral component in contemporary society, poised to assume a major role in the lives of many individuals. Artificial intelligence (AI) technology have the capacity to provide advantages to various income groups and provide substantial benefits for both developed and emerging nations [8]. AI has the potential to provide new and innovative work possibilities, resulting in a more productive and efficient economy [9]. Task automation may help businesses perform better by eliminating errors, enhancing quality, and increasing speed. Several occupations will see changes in the future [10]. As a result, our education, skills, and way of life must evolve. On the other hand, modern technologies are beginning to remove more jobs than they generate. In actuality, the world will get more complicated and narcissistic in the future, with insufficient work to go around [11]. Advances in AI and similar kinds of automation have raised concerns about job losses and rising inequality. This is a prevalent issue in high-income nations. Developing countries and emerging market economies should be concerned even more than high-income ones [12]. Extensive deployment of AI might potentially jeopardize societal progress in reducing poverty and inequality. It has been discovered that living standards grew in the US economy and many other high-income and expanding countries throughout the three decades after World War II. However, during the last 50 years, output growth and average worker pay have begun to diverge. Again, economic theory cautions that technological advancement will produce both winners and

losers [13]. As long as the winners and losers from technical advancement are located inside the same country, domestic policy actions can at least compensate the losers. However, as technical development deteriorates trade conditions and hence undermines entire countries' comparative advantage, entire nations may be worse off, unless winners within one country pay losers in other countries, which is politically problematic [14]. It is an analytical research that evaluates the future potential and problems of AI, as well as the worldwide future ramifications. There is also talk on how we may better prepare for future crises.

2. Basic of AI and Background History

We all know that logic is used to describe information and solve problems. However, it may also be used to other challenges [15]. Today, several distinct types of logic are used extensively in AI research. When it comes to propositional logic [16], It employs truth functions such as 'or' and 'not'. [17]. First-order logic, on the other hand, includes quantifiers and predicates, as well as the ability to describe facts about things, their attributes, and their relationships to one another [18]. Fuzzy logic, on the other hand, provides a 'degree of truth' (between 0 and 1) to fuzzy propositions such as 'Alice is young' (or rich, or tall, or white, or hungry), which are too linguistically vague to be totally true or false [19]. Again, default logics, non-monotonic logics, and circumscription are examples of such logics that are intended to aid with default reasoning and the precondition problem [20]. Description logics; situation calculus, event calculus, and fluent calculus for capturing events and time [21]; causal calculus [22]; belief calculus for belief revision; and modal logics [23] are only a few examples of logic extensions designed to handle specific categories of knowledge. Para-consistent logics [24] have been devised to simulate contradictory or inconsistent claims that arise in multi-agent systems. The typical AI challenges of reasoning, planning, learning, perception, and robotics need the agent to function with insufficient or indeterminate knowledge. AI researchers have developed a number of strategies to handle these difficulties, such as utilizing

probability theory and economic knowledge [25]. Probabilistic algorithms may also be used to filter, forecast, level, and discover explanations for data streams, as well as to assist perception systems in evaluating processes that occur across time.

Utility is an important term in economics that measures how valuable something is to an intelligent agent. Using decision theory, decision analysis, and information value theory, precise mathematical methods have been constructed to examine how an agent might make decisions and plan [26]. Models such as Markov decision processes, dynamic decision networks, game theory, and mechanism design have been included among these tools [27]. There are two types of AI applications: classifiers (such as "if shiny, then diamond") and controls (such as "if diamond, then pick up"). Many AI systems rely heavily on classification. Classifiers are functions that match patterns to determine the best match. They can be altered depending on examples, making them an excellent choice for AI. These are referred to as observations or patterns [28]. In supervised learning, each pattern is assigned to a certain predetermined class. And a class is a choice that must be made. A data set is all of the observations together with their class designations. When a new observation is obtained, it must be categorised based on past experience. Controllers group scenarios as well before deciding what to do, which is to do? The architecture of neurons in the human brain influenced the design of neural networks [29]. The back propagation method is the most often used training approach. Other neural network learning strategies include Hebbian learning and competitive learning [16]. The two basic types of networks are acyclic or feedforward neural networks, in which the data only travels in one way, and recurrent neural networks, in which feedback and short-term memory of earlier input events are possible [30]. AI-specific languages like as Lisp, Prolog, TensorFlow, and others have been developed. Simultaneously, hardware for AI has been created, including AI accelerators and neuromorphic computers [31]. Again, graphics processing units (GPUs) supplanted central processing units (CPUs) as the leading way of training large-scale commercial cloud AI [32].

Figure 1. Robots and human working in industry side by side [33, 34].

AI is an interdisciplinary discipline with numerous

techniques; advances in machine learning (ML) and deep

learning, in particular, are causing a paradigm change in almost every area of the tech industry [35]. Actually, AI is the foundation of current computer innovation, unleashing value for consumers and enterprises [36]. Machine Learning (ML) is the discipline of teaching machines to understand, process, and analyze data in order to rapidly solve real-world and real-time issues [37]. Deep Learning is a branch of machine learning that may be used to address increasingly complex issues [38]. Robotics is a field of AI that focuses on various branches/sectors and robot applications [39]. AI techniques such as ML and deep learning are only two examples of how they might help with this endeavor. Training AI systems entails providing appropriate training data to the algorithms. AI systems are extremely effective alternatives for any process requiring intelligent decision-making since they may become experts much faster than humans [16]. This makes AI an extraordinarily powerful and hugely useful technology, because it effectively allows computers to think and behave like humans; and this should be considerably quicker and with far more processing capacity than the human brain can create [40]. Today, AI can solve many issues by intelligently looking through a large number of potential solutions [18].

AI and intelligent robots initially featured in Greek mythology [41]. The creation of syllogism and its application of deductive reasoning by Greek philosopher Aristotle was a watershed point in humanity's search to comprehend its own intellect. Actually, AI has a long and rich history. The history of AI as we know it now is less than a century long. There are a few significant occurrences in AI that have been seen [42]. The chronological evolution of AI with phases is depicted below.

1) In 1942, Isaac Asimov publishes the Three Laws of Robotics, an idea commonly found in science fiction media about how AI should not bring harm to humans [43].

2) In 1943, Warren McCullough and Walter Pitts publish the paper 'A Logical Calculus of Ideas Immanent in Nervous Activity' which proposes the first mathematical model for building a neural network.

3) In 1949, in his book 'The Organization of Behavior: A Neuropsychological Theory' Donald Hebb proposes the theory that neural pathways are created from experiences and that connections between neurons become stronger the more frequently they're used. Hebbian learning continues to be an important model in AI.

4) In 1950, Alan Turing publishes the paper 'Computing Machinery and Intelligence' proposing what is now known as the Turing Test, a method for determining if a machine is intelligent.

5) In 1950, Harvard undergraduates Marvin Minsky and Dean Edmonds build SNARC, the first neural network computer [44].

6) In 1950, Claude Shannon publishes the paper 'Programming a Computer for Playing Chess.'

7) In 1952, Arthur Samuel develops a self-learning program to play checkers.

8) In 1954, The Georgetown-IBM machine translation experiment automatically translates 60 carefully selected Russian sentences into English.

9) In 1956, the phrase "artificial intelligence" is coined at the Dartmouth Summer Research Project on Artificial Intelligence. Led by John McCarthy, the conference is widely considered to be the birthplace of AI.

10) In 1956, Allen Newell and Herbert Simon demonstrate Logic Theorist (LT), the first reasoning program.

11) In 1958, John McCarthy develops the AI programming language Lisp and publishes 'Programs with Common Sense' a paper proposing the hypothetical Advice Taker, a complete AI system with the ability to learn from experience as effectively as humans.

12) In 1959, Allen Newell, Herbert Simon and J. C. Shaw develop the General Problem Solver (GPS), a program designed to imitate human problem-solving.

13) In 1959, Herbert Gelernter develops the Geometry Theorem Prover Program.

14) In 1959, Arthur Samuel coins the term "machine learning" while at IBM.

15) In 1959, John McCarthy and Marvin Minsky found the MIT Artificial Intelligence Project.

16) In 1963, John McCarthy starts the AI Lab at Stanford.

17) In 1966, The Automatic Language Processing Advisory Committee (ALPAC) report by the U.S. government details the lack of progress in machine translations research, a major Cold War initiative with the promise of automatic and instantaneous translation of Russian. The ALPAC report leads to the cancellation of all government-funded MT projects.

18) In 1969, the first successful expert systems, DENDRAL and MYCIN, are created at Stanford.

19) In 1972, the logic programming language PROLOG is created.

20) In 1973, the Lighthill Report, detailing the disappointments in AI research, is released by the British government and leads to severe cuts in funding for AI projects.

21) In 1974-1980, Frustration with the progress of AI development leads to major DARPA cutbacks in academic grants. Combined with the earlier ALPAC report and the previous year's Lighthill Report, AI funding dries up and research stalls. This period is known as the 'First AI Winter.'

22) In 1980, Digital Equipment Corporation's develops R1 (also known as XCON), the first successful commercial expert system. Designed to configure orders for new computer systems, R1 kicks off an investment boom in expert systems that will last for much of the decade, effectively ending the first AI Winter.

23) In 1982, Japan's Ministry of International Trade and Industry launches the ambitious Fifth Generation Computer Systems project. The goal of FGCS is to develop supercomputer-like performance and a platform for AI development.

24) In 1983, In response to Japan's FGCS, the U.S. government launches the Strategic Computing Initiative to provide DARPA funded research in advanced computing and AI.

25) In 1985, Companies are spending more than a billion dollars a year on expert systems and an entire industry known as the Lisp machine market springs up to support them. Companies like Symbolics and Lisp Machines Inc. build specialized computers to run on the AI programming language Lisp.

26) In 1987-1993, As computing technology improved, cheaper alternatives emerged and the Lisp machine market collapsed in 1987, ushering in the 'Second AI Winter.' During this period, expert systems proved too expensive to maintain and update, eventually falling out of favor.

27) In 1991, U.S. forces deploy DART, an automated logistics planning and scheduling tool, during the Gulf War.

28) In 1992, Japan terminates the FGCS project in 1992, citing failure in meeting the ambitious goals outlined a decade earlier.

29) In 1993, DARPA ends the Strategic Computing Initiative in 1993 after spending nearly $1 billion and falling far short of expectations.

30) In 1997, IBM's Deep Blue beats world chess champion Gary Kasparov.

31) In 2005, STANLEY, a self-driving car, wins the DARPA Grand Challenge.

32) In 2005, The U.S. military begins investing in autonomous robots like Boston Dynamics' "Big Dog" and iRobot's "PackBot."

33) In 2008, Google makes breakthroughs in speech recognition and introduces the feature in its iPhone app.

34) In 2011, IBM's Watson handily defeats the competition on Jeopardy!.

35) In 2011, Apple releases Siri, an AI-powered virtual assistant through its iOS operating system.

36) In 2012, Andrew Ng, founder of the Google Brain Deep Learning project, feeds a neural network using deep learning algorithms 10 million YouTube videos as a training set. The neural network learned to recognize a cat without being told what a cat is, ushering in the breakthrough era for neural networks and deep learning funding.

37) In 2014, Google makes the first self-driving car to pass a state driving test.

38) In 2014, Amazon's Alexa, a virtual home smart device, is released [45].

39) In 2016, Google DeepMind's AlphaGo defeats world champion Go player Lee Sedol. The complexity of the ancient Chinese game was seen as a major hurdle to clear in AI [46].

40) In 2016, The first "robot citizen," a humanoid robot named Sophia, is created by Hanson Robotics and is capable of facial recognition, verbal communication and facial expression.

41) In 2018, Google releases natural language processing engine BERT, reducing barriers in translation and understanding by ML applications [47].

42) In 2018, Waymo launches its Waymo One service, allowing users throughout the Phoenix metropolitan area to request a pick-up from one of the company's self-driving vehicles.

43) In 2020, Baidu releases its LinearFold AI algorithm to scientific and medical teams working to develop a vaccine during the early stages of the SARS-CoV-2 pandemic. The algorithm is able to predict the RNA sequence of the virus in just 27 seconds, 120 times faster than other methods.

44) In 2020, OpenAI releases natural language processing model GPT-3, which is able to produce text modeled after the way people speak and write.

45) In 2021, OpenAI builds on GPT-3 to develop DALL-E, which is able to create images from text prompts.

46) In 2022, The National Institute of Standards and Technology releases the first draft of its AI Risk Management Framework, voluntary U.S. guidance 'to better manage risks to individuals, organizations, and society associated with artificial intelligence.'

47) In 2022, DeepMind unveils Gato, an AI system trained to perform hundreds of tasks, including playing Atari, captioning images and using a robotic arm to stack blocks [48].

48) In 2022, OpenAI launches ChatGPT, a chatbot powered by a large language model that gains more than 100 million users in just a few months.

49) In 2023, Microsoft launches an AI-powered version of Bing, its search engine, built on the same technology that powers ChatGPT.

50) In 2023, Google announces Bard, a competing conversational AI.

51) In 2023, OpenAI Launches GPT-4, and that is most sophisticated language model yet [49].

3. Prospect and Multiple Use of AI

AI refers to systems that exhibit intelligent behavior by assessing their surroundings and acting autonomously to achieve particular goals. AI-based systems can be completely software-based, such as voice assistants, image analysis software, search engines, speech and facial recognition systems, or AI can be incorporated in hardware devices such as sophisticated robotics, autonomous automobiles, drones, or Internet of Things (Iota) applications. In the early decades of the twenty-first century, highly mathematical and statistical ML dominated the area, and this method has shown to be extremely successful in solving many tough issues in business and academics [50]. Traditional AI research aims include reasoning, knowledge representation, planning, learning, natural language processing, perception, and object movement and manipulation [51]. General intelligence is defined as the capacity to answer any arbitrary problem and

is one of the field's long-term objectives [52]. To address these challenges, AI researchers have adapted and incorporated a wide range of problem-solving approaches such as search and mathematical optimization, formal logic, artificial neural networks, and methodologies based on statistics, probability, and economics. AI also makes use of computer science, psychology, medicine, healthcare, language, philosophy, and other areas [53]. AI applications include advanced web search engines (such as Google, Bing, Baidu, and Yahoo), recommendation systems (such as YouTube, Amazon, and Netflix), speech recognition (such as Sire, Alexa), self-driving cars (such as Waymo, AutoX, Cruise, Motional, and Manga International), and generative or creative tools (such as ChatGPT, Microsoft Bing, and Google Bard). Artificial intelligence (AI, Perplexity AI, AI art, Amazon Codewhisperer), automated decision-making, and playing at the top level in strategic gaming systems (such as chess, Go, Arimaa, Dameo) [20]. Future AI effects, such as optical character recognition, are typically removed from items deemed to be AI, despite the fact that it has become a common technology [54].

There are many of effective AI applications now that are utilized to address challenges for certain businesses or organizations. Energy storage [55], deepfakes [56], medical diagnostics, military logistics, foreign politics [57], and supply chain management are a few examples. In the future, AI will have a stronger influence on technology by impacting every industry, machinery, equipment, and gadget. AI has been used in facial recognition systems with a 99 percent accuracy rate. Apple's FaceID and Android's Face Unlock are two examples. These two are used in the security of mobile devices. Google has used image tagging to recognize items in pictures and to enable users to search using images. It has also been demonstrated that it can create speech in order to describe sights to blind people [58]. It can anticipate or simplify client behavior based on their digital footprints [59]. AI is being used by online gaming businesses to enhance client targeting [60]. AI has been used to personalize offers and customize shopping alternatives [61]. AI is used by intelligent personal assistants to grasp various natural language requests in ways other than basic instructions. Apple's Siri, Amazon's Alexa, and a more modern AI, ChatGPT from OpenAI [62], are examples. Machine learning may be used to combat spam, frauds, and phishing. It can examine the contents of spam and phishing attempts for dangerous components [63].

Artificial intelligence has been used to automatically translate spoken and written language [64]. Furthermore, research and development are being conducted to interpret and perform animal communication [65]. While no system can achieve the objective of totally automatic high-quality machine translation of unlimited text, several fully automated systems generate adequate results [66]. AIs is going to produced superhuman in near future results in many games, like chess (DeepBlue), Jeopardy (Watson) [67], Go (AlphaGo) [68], poker (Pluribus and Cepheus) [69], E-sports (StarCraft) [70], AlphaZero, MuZero) [71]. In most chess systems, AI has supplanted hand-coded algorithms [72]. Poker, on the other hand, lacks the perfect knowledge of go

or chess. As a result, a poker playing software must be able to reason in the face of unknowns. The general population functions on information given by the game system rather than the rules themselves. A new ITU initiative dubbed AI for Good is assisting institutions that use AI to address global economic and social challenges. The University of Southern California founded the Centre for AI in Society to apply artificial intelligence to social concerns such as homelessness. Stanford University is using AI to examine satellite photographs in search of pockets of concentrated poverty [73]. In agriculture, AI has assisted farmers in identifying regions that require irrigation, fertilization, pesticide treatments, or yield increase [74]. AI is now used by agronomists to perform research and development. AI has also been used to predict the ripening time for crops such as tomatoes [75], monitor soil moisture, operate agricultural robots, conduct predictive analytics [76], classify livestock pig and cow call emotions, automate greenhouses [77], detect diseases and pests [78], save water [79], etc. AI will eventually be utilized to entirely automate most cyber security activities [80].

AI, like technology that hampers pupils' ability to stay on target [81], might produce a dysfunctional scenario with retribution repercussions [82]. In a virtual learning environment (VLE) such as Moodle, AI can give early prediction of student achievement [83]. AI can assist students customise their training during the educational process. Furthermore, for educators, AI technology can increase the quality of the educational process and teaching skills [84]. AI is utilized to help huge financial institutions make investment decisions. Aladdin, BlackRock's AI engine, is utilized by the company and its clients to make smarter investment decisions. SQREEM (Sequential Quantum Reduction and Extraction Model) is a data mining technique used by banks such as UBS and Deutsche Bank to generate customer profiles and better personalize wealth management products to specific clients [85]. It uses natural language processing to examine material like as news, broker reports, and social media feeds. Banks employ AI to coordinate operations, bookkeeping, stock investment, and property management. When there is no company, AI can adapt to changes [86]. Today, artificial intelligence (AI) is utilized to prevent fraud and financial crimes by analyzing behavioral patterns for any odd changes or abnormalities [87]. The use of artificial intelligence (AI) in applications such as online trading and decision making has altered major economic theories [88]. AI-powered buying and selling systems, for example, anticipate personalized demand and supply curves and hence offer individualized pricing. AI robots minimize market knowledge asymmetry and increase market efficiency [89]. Many banks, funds, and proprietary trading organizations now have AI-managed portfolios. Large institutional investors often utilize automated trading systems, although smaller enterprises trading with their own AI systems are also included [90]. There are several applications in which AI assists ordinary people in their daily lives.

4. Prospect of AI in the Era of 4th Industrial Revolution (4IR)

Artificial intelligence (AI) has been present for a long time. The benefit of AI is that it is progressively enhancing our daily lives. The technique is being utilized for robots that make ideas at shopping malls or internet search engines [91]. AI systems today simulate human analysis. It is the computer program's capacity to think and learn. Everything may be considered AI if it involves a software that performs something that we normally attribute to human intellect. AI innovations have resulted in a variety of advantages across numerous businesses and sectors [92]. Today, AI and other technology experts claim that the emergence of AI will benefit the majority of people over the next decade, but many are concerned about how improvements in AI may influence and redefine what it means to be human. to be productive and free. The automation revolution will have a huge influence on the basics of business and society, as well as the possibilities for creativity and productivity. Big data, machine learning, and blockchain technology have the potential to disrupt most sectors throughout the world in the near future [93]. From an IT aspect, AI may enhance data backup and disaster recovery planning and policy to ensure seamless corporate continuity. The aspects of effective technology and IT leadership continue to develop, but the need for strong business strategy, vision, and IT management, as well as an understanding of risk, compliance, and outsourcing, remains constant. However, AI is still as crucial as ever [94]. Human potential is being enhanced by digital life while long-standing human activity is being disrupted.

Today, more than half of the world's population uses code-driven systems, which bring both exceptional promise and never-before-seen obstacles [97]. The issue today is whether humans will be better off than they are now as algorithm-driven AI spreads. AI will have an immediate and long-term influence on the whole agricultural and food value chain, from farm to fork. AI will affect next-generation automobile or automotive technology, changing how cars, trucks, and powertrains are developed and manufactured [98]. AI will have an impact on the technological advancements of the worldwide aviation and aerospace industries. It will also have an impact on space travel and communications, road traffic, airport operations and management, air traffic control systems, and future trends in flight and aviation transport. AI will impact technological innovation, altering all aspects of the construction and civil engineering industries, resulting in cost, safety, efficiency, and construction quality improvements [99]. AI will have an influence on smart phones, tablets, and wearable tech gadgets, as well as how people live, work, and consume services, pushing companies to develop their own techniques for dealing with and capitalizing on such use at the back end [100].
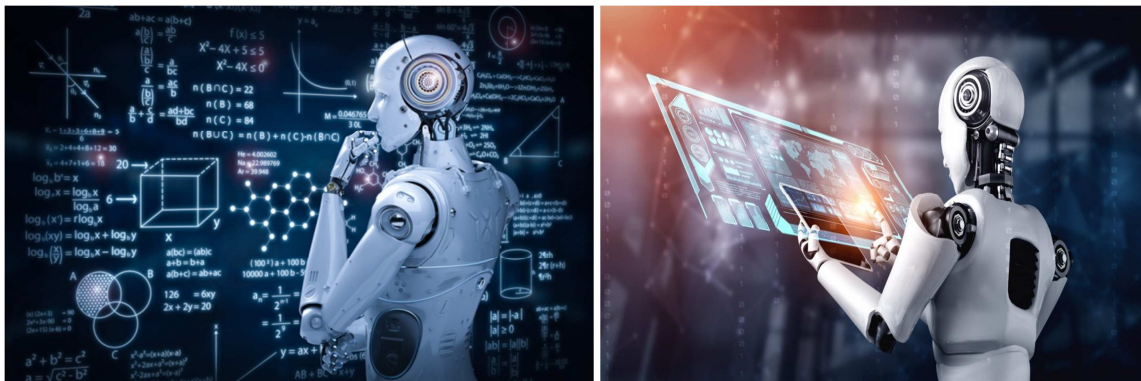

Figure 2. *Use of Robots and AI in industry and education system [95, 96].*

Experts projected that networked AI will boost human effectiveness while undermining human autonomy, agency, and skills [101]. When it comes to making complex judgments, learning, reasoning, pattern recognition, visual acuity, speech recognition, and language translation, computers may be as clever as or smarter than humans. Smart technologies in neighborhoods, automobiles, buildings, utilities, farms, and corporate operations will save time, money, and lives while providing people with the opportunity to live in a more customized future [102]. The use of artificial intelligence in healthcare seems promising, with applications such as diagnosing and treating illnesses and supporting elderly persons in living fuller and healthier lives. They were especially excited about AI's engagement in large-scale public-health programs based on massive quantities of data that may be collected in the next years on anything from personal genomes to diet [103]. Long-awaited reforms in formal and informal education systems would be aided by AI.

We can witness how our society is evolving as a result of the extensive use of AI, ML, and IoT in daily operations. When we visit a healthcare facility, an AI-powered machine will check our pulse, and when we visit an internet store, an AI tool will recommend a list to us. These are just a few examples of how AI may assist us in our daily lives. AI will provide much more in the future. As time passes, more industries, service sectors, and organizations will embrace this disruptive technology to improve every human activity working process [104]. By making the workplace more productive, supporting us in making better decisions, and

giving direct assistance, AI may help to simplify and speed processes in the community, society, country, and planet. AI may be useful in recognizing and addressing problems that humans are unable to notice or resolve on their own. Some people, however, do not see the benefits of AI because they feel it would cause humans to lose their jobs and become less clever. In actuality, the primary benefits of AI are its speed, precision, efficiency, and scalability.

The 4IR will drastically change industries, services, and other sectors, such that most of the job that exists today will no longer exist in the next 25 years. It is critical that we comprehend the implications of these developments for all aspects of our life, including academic and learning institutions. According to a recent PwC study of CFOs, although the COVID-19 problem has caused 70% of enterprises to reduce or postpone planned expenditures, just 22% have reduced investments in digital transformation [105]. All graduates are currently presented with a digitally altered world in which AI, IoT, ML, Big Data, AR, VR, Cloud and Edge Computing, and social media provide a variety of opportunities and problems for traditional education systems. As students evaluate their post-diploma or post-graduation lives, formal academic and learning institutions assess their fate, especially in terms of employment. Almost all modern AI-powered technologies are revolutionizing the world to the point that societal ideas like "post-work" are increasingly defining the modern era. This time necessitates abilities that differ from those necessary during the Third Industrial Revolution (IR), when information technology (IT) was the dominant engine. AI is expected to be a $15 trillion business within the next seven years. Millions of people, both unskilled and formally trained, will be laid off [106]. On the other hand, millions of contemporary and high-tech occupations will be generated in the next years [107].

The world's society is nearing a tipping point. The worldwide AI adoption rate has consistently increased to more than 35%. In certain businesses and nations, AI is used nearly everywhere and in all areas. AI is fast delivering new advantages and efficiency to enterprises all over the world through increased automation capabilities, predictability, improved simplicity of use and accessibility, and a broader range of well-established applications in all circumstances. AI is being used in both off-the-shelf products such as virtual assistants and in current corporate activities such as IT procedures. There is encouraging data on the value of accessibility. Currently, 44 percent of firms are striving to integrate AI into existing systems and processes. The IBM Global AI Adoption Index has offered insights on global AI adoption, the hurdles and problems preventing AI from realizing its full potential, and the use cases; sectors, industries, and countries where AI is most likely to succeed. Today, AI provides a blueprint for 42 percent of firms who are exploring the use of AI, as well as a glimpse into future AI trends and problems. The IBM-commissioned research offers new insight on the implementation of AI across 7,502 enterprises worldwide. From whence, 500 in each of the following countries: the United States, China, India, the United Arab Emirates, South Korea, Australia, Singapore, Canada, the United Kingdom, Italy, Spain, France, and Germany; and 1,000 in Latin America, including Brazil, Mexico, Colombia, Argentina, Chile, and Peru. From March 30 to April 12, 2022, Morning Consult's unique network of web providers performed the polling [108]. As previously stated, IBM lead the industry in the number of issued AI, cloud, quantum computing, and security-related patents. Daro Gil, Senior Vice President and Director of IBM Research, has stated the opposite. 'Now more than ever, the world requires scientific thought and action. IBM's consistent investment in R&D, whether in good and bad times, has opened the path for new products and new frontiers of information technology that have substantially benefitted our clients and society [109].

5. Challenges and Risk of AI

The primary issue of AI systems is that they are typically so complex that it is difficult to figure out or comprehend why they do what they do and how they do it. Today, AI is based on a highly successful technology known as ML. Surprisingly, we can't open the lid to observe how it works. So we must believe it. So the issue is to devise new methods for keeping an eye on or checking up on the numerous locations where AI is now so crucial that there is no way to escape it. 'There is a risk that the rising complexity of computer systems may prohibit them from getting the scrutiny they require,' said Jonathan Zittrain, a professor of internet law at Harvard Law School. I'm concerned about the erosion of human freedom as our systems get more intricate and interwoven thanks to technological advances. 'If we set it and forget it, we may lament how a system develops and the lack of a clear location for an ethical dimension to be considered,' he added. Missy Cummings, the head of the Human and Autonomy Lab at Duke University in North Carolina, was one of the first female fighter pilots in the US Navy and is now an expert in drones. 'How will we be able to certify these technologies as safe?' she has asked. AI will need to be monitored, but how this should be done is unclear. There are currently no ways on which everyone can agree. 'Without an industry standard for evaluating these sorts of systems, it's difficult for these technologies to be extensively adopted,' Cummings added.'

In today's fast-paced world, regulatory agencies are regularly forced to play catch-up. Companies are already investigating the effectiveness of utilizing AI to make parole decisions or detect sickness in several critical areas, like the criminal justice system and healthcare. But, by entrusting decision-making to computers, we risk losing control; are we to believe that the system is accurate in each of these cases? Principal researcher at Microsoft Research Danah Boyd said that 'there are fundamental problems about the values that are being programmed into such systems and who is ultimately responsible for them' Regulators, civic society, and social theorists all want new technologies to be fair and ethical, but

their ideas are fuzzy at best. The workplace is fraught with ethical quandaries. In the future, AI will enable robots to do increasingly complex tasks and displace more human labor. For example, China's Foxconn Technology Group [110], which supplies Apple and Samsung, has announced that, it aims to replace 60,000 factory workers with robots. At Ford's plant in Cologne, Germany [111], robots work alongside people on the floor.

The specifics of who sits on Google's ethical board and what it really performs are unknown, but in September 2022, Facebook, Google, and Amazon formed a partnership to research answers to the jungle of problems associated to AI's safety and privacy [112]. Again, OpenAI is an organization committed to the development and promotion of open-source artificial intelligence for the benefit of all. 'It's critical that machine learning research be conducted freely and distributed through open publications and open-source code, so that we can all reap the benefits,' said Google's Norvig. OpenAI, in truth, is a non-profit AI research group. Their goal is to improve digital intelligence in the most likely way to benefit mankind as a whole, regardless of financial gain. Because their research is not limited by financial limitations, they may focus on generating a positive human effect [113]. It is critical to establish a brain trust comprising ethicists, technologists, and corporate executives if we are to define industrial and ethical standards and get a full understanding of what is at stake. It comes down to using AI to improve on what people are already excellent at. 'Our work is less concerned with a science fiction robot takeover and more

concerned with how technology might be used to enhance human contemplation and decision-making, rather than fully replacing it,' Zittrain added.

A super-intelligence, also known as hyper-intelligence, is a hypothetical agent that may also refer to the sort or amount of intellect that such an entity has [114]. If AGI research yielded enough intelligent software, it may be able to reprogram and enhance itself, resulting in recursive self-improvement [115]. Vernor Vinge, a science fiction writer, dubbed this situation the "singularity" [116]. It is difficult or impossible to foresee the capabilities of super-intelligent computers, which is referred to as the technological singularity [117] and is an event beyond which events are unexpected or even unfathomable [118]. In addition, ML AI may create tens of thousands of dangerous compounds in a couple of hours [119]. ML AI can also create and build such a robot that can take control of nuclear weapons used by any nation's military [120]. And this will be the greatest threat to the entire civilization [121]. Robot designer Hans Moravec [122], cyberneticist Kevin Warwick, and inventor Ray Kurzweil have all prophesied that in the future, humans and machines would combine into cyborgs that will be more competent and powerful than either. This concept is known as transhumanism [123], and according to Edward Fredkin [124], 'AI is the next step in evolution.' A poll of economists revealed disagreement over whether the increased use of robots and AI will result in a significant rise in long-term unemployment' [125], but they generally believe that if productivity gains are shared, it might be a net positive [126].
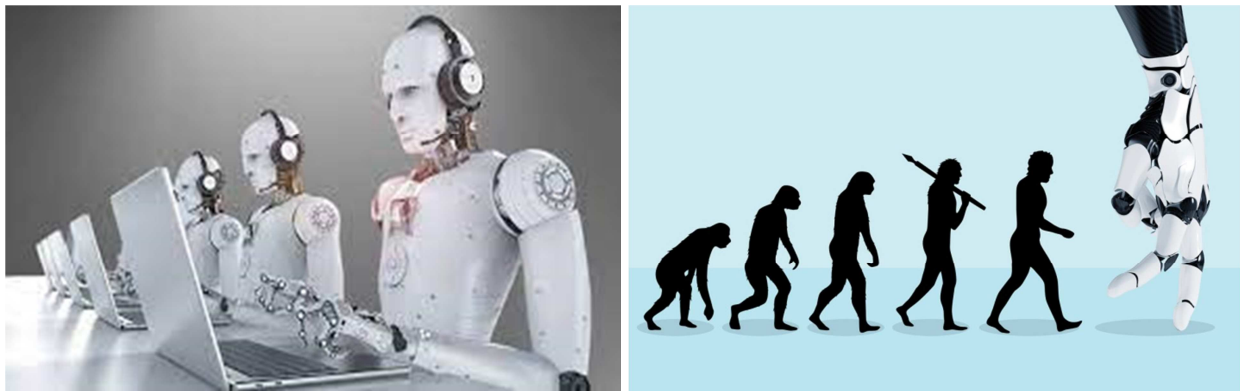

Figure 3. Machines may rule over humans in future [127] both certainty and uncertainty of life [128].

Michael Osborne and Carl Benedikt Frey estimate 47% of U.S. jobs are at 'high risk' of potential automation [129], while an OECD report classifies only 9% of U.S. jobs are 'high risk [130]. However, AI may destroy many middle-class and white-collar occupations [131]. In contrast, job demand for service and care-related occupations is expected to rise. In any event, AI, IoT, ML, and automation will undoubtedly reduce the labor force/market [132]. Advanced artificial intelligence can make centralized decision making more competitive with liberal and decentralized systems such as markets [133]. Other kinds of weaponized AI, such as sophisticated digital warfare and lethal autonomous weaponry, may be used by terrorists, criminals, and rogue

nations [134]. Battlefield robots are on their way [135]. Health equity issues may also be worsen when many-to-many mapping are done without taking steps to ensure equity for populations at risk for bias [136]. However, unless AI and robotics systems are proven to be devoid of bias errors, they remain dangerous [137]. There has been some debate regarding whether and to what degree works made with the help of AI are protected by copyright rules [138]. The legislative and policy landscape for AI is evolving in jurisdictions throughout the world [139]. In 2023, OpenAI leaders issued ideas for superintelligence governance, which most governments anticipate will occur in less than ten years [140].

AI, according to computer scientists and philosophers, may become an unanticipated peril to civilization if its reasoning powers are not directed toward human advantage [141]. Economists have underlined the hazards of AI-related redundancies and speculated on unemployment if suitable social policies for mass/general employment are not implemented [142]. The term AI has also been questioned by the legal profession [143]. The difficulties of AI control and alignment are two areas of concern: managing a superintelligent computer or infusing it with human compatible ideals may be a more difficult task than previously thought [144]. Many scholars believe that superintelligence would resist attempts to turn it off or modify its aims; as such, an incident would prevent it from achieving its current goals and that aligning superintelligence will be exceedingly difficult [145]. Skeptics, on the other hand, claim that superintelligent robots will have no need for self-preservation. And this is not the case [146]. Again, an unexpected 'intelligence explosion' might catch the human species off guard [147]. However, in the future, it is possible to jump from subhuman performance in many areas to superhuman performance in virtually all domains, as AlphaZero in the domain of Go demonstrated that AI systems can sometimes progress from narrow human-level ability to narrow superhuman ability extremely and rapidly [148]. We can perform algebra without picturing the world of numbers, and we can figure out how gravity works in another galaxy without having to tread on it and claim to have felt and measured it [149].

As technology progresses, certain talents become outdated, while demand for other new technology-related abilities increases. Such paradigm shifts provide new and varied career opportunities. Simultaneously, automation, IoT, ML, and AI are replacing the need for human input in some lower-skilled positions. Since a result, many individuals, particularly low-skilled employees, are at risk of being left behind, as administrative, routine, and repetitive activities will be completely automated in the near future. This is a concerning image for poor, LDC, and developing countries. Even in OECD-member nations, roughly 14% of employment are in this category, with another 32% at high danger of becoming at least partially automated. As a result, about one in every two persons is likely to be affected in some form. Many industries have incorporated robot suits and other automated technology and equipment, and workers must learn how to operate with them/them. Again, between 2005 and 2016, over 40% of new such technology-related occupations were generated. However, 6 out of 10 workers in OECD nations lack basic computer skills, with a further 40% lacking in technologically heavy sectors. At the same time, the manufacturing and service industries are utilizing new technology to execute their tasks more efficiently and rapidly, as well as obtaining work through online platforms and working in novel ways with age groups from all over the world. The ICT industry is a crucial engine of economic growth in OCED nations, according to the OECD Digital Economy Outlook (OECD 2015). Between 2008 and 2013, the ICT industry accounted for 15 to 52 percent of all investments in OECD nations. Furthermore, following a lull in the industry's contribution to employment creation during the economic crises, the ICT sector now accounts for 22 percent of jobs produced in OECD nations [150].

A recent World Economic Forum poll found that 40% of SMEs ceased operations during the pandemic, resulting in layoffs and other cost-cutting measures [151]. Leaders must make difficult decisions that have a big impact on their workforce and employee well-being in today's volatile climate. With the vast amount of data acquired on the internet, new threats such as increasingly frequent and costly cyber-attacks have emerged [152]. Business executives are already utilizing new computational and artificial intelligence (AI) tools to help in strategic decision-making. During the next decade, this software will become more powerful and will be employed in new and different circumstances. AI systems based on game theory mathematics take use of the computer advances that power chess engines. The physical workplace has mostly been replaced by digital infrastructure, allowing CEOs to create a more efficient, balanced staff with asynchronous work patterns. Technology has leveled the playing field in venture capital by eliminating prejudice that could otherwise have worked against founders and financiers. The next issue will be to maintain a common goal while employing technology to improve human understanding and expertise [153].

6. Future Preparation with AI Reality

Data will be a critical input in the future AI economy. As a result, information policy and data management and usage rules have risen to the top of the policy agenda. Without proper public oversight, multinational technology companies shape the data regulation agenda in their own self-interest. This has already happened in recent trade agreements. Furthermore, the monopolization of data by global AI businesses makes it more difficult for emerging countries to catch up and create their own AI-based enterprises. Global firms may use their access to massive volumes of data from across the world to improve the quality of their products and services for consumers [154]. This makes it increasingly difficult for new enterprises in emerging nations to catch up to the leaders. Europe has worked hard to develop laws that ensure the advantages of new digital technologies are shared while keeping the bad impacts to a minimum. For example, the EU has proposed proposals to compel data sharing in order to prevent monopolies from growing stronger by retaining data. Giving individuals power over their own data, however, will not enough. People will surrender their data to digital behemoths and internet service providers if there is no effective legislation in place, and they will receive very little in return. There are just too many disparities in information and power to provide a fair outcome [155].

Again, new standards regarding advertising targeting and algorithmic transparency are required, but they are insufficient on their own. Pricing and promotion may be used

to discriminate, and policymakers must be equipped to cope with this. There should also be tougher restrictions in place to safeguard privacy and prevent the rapid spread of misleading information, statements in support of violence and hatred, and other damaging communications, even when transmitted as part of a political campaign [156]. In the United States, the Section 230 clause, which limits internet corporations' responsibility in comparison to other publications, is an example of a rule that should be revisited [157]. As with competition policy, the nations in which digital giants are located may not have the right incentives to monitor their firms' global activity because they share in the rents that these corporations receive across the world [158]. Developing nations must collaborate and join together in order to have the influence to impose legislation on global behemoths that represents their developmental objectives.

Technical education is information on finer life skills that provide students an advantage over standard learning. Audio editing, video editing, voice modulation, recorded coddling, little programming, and so on are all intriguing skill sets that need a finer and more sophisticated knowledge. These skills are generally seen in students who are inventive or have a softer side to their academic nature, allowing them to experiment and explore rather than following the rules and staying between the lines. Traditional career paths for today's students and youth, such as manager, accountant, doctor, lawyer, or administrator, are being replaced by jobs that require far more technical knowledge and skill, such as digital sound or video editing, AI, ML, or IoT specialist, robot or data scientist, technologist, or engineer. We must keep in mind that the future world will require technicians, engineers, and technologists with sophisticated digital and smart knowledge, skills, expertise, and capacities. So, our education system and human resource development programs should include such meaningful curriculum and syllabus that may adequately train our next generation.

Every nation's progress is contingent on the proper use of people and physical resources, which is dependent on manpower training and skill development. Actually, technical education is all about skill development. Skilled workers may undeniably increase output. Technical education provides people required skills and information for society and industry. The fast industrialization of Japan may be credited to the accumulation of technical skills, knowledge, and know-how, as well as the country's strong commitment to education, particularly technical professional training. Technical education enhances not just analytical and functional abilities, but also efficiency, skills, knowledge, and profitability, all of which are essential for any country's economic success. AI may now be able to optimize profit while simultaneously increasing inclusive growth. AI assists investment selections by analyzing facts rather than heuristics to determine whether entrepreneurs and small businesses are positioned to win [159]. Understanding the technologies themselves, in all their richness and complexity, and how they work, the limits of what they can do, what they were designed to do, and how they are actually used, is essential for understanding how technology has caused global change and, in turn, how global changes have influenced the development of new technologies [160].

In 2002, UNESCO and ILO announced in Geneva that technical and vocational education, as well as training, is the primary driver of a developing nation in the twenty-first century. Previously, formal education was largely connected with humanities or areas such as engineering, medicine, and mathematics. An educated individual was generally someone who sat in an office someplace performing mainly intellectual work. Technical education, on the other hand, is education that involves direct physical work and the actual application of one's talents. Modern civilization cannot function without skilled workers [161]. The world's socioeconomic situation is constantly changing, and the value of technical education is increasing. It is now understood by both students and educational institutions. Computing Power, Smarter Devices, Datafication (such as coding), AI and Machine Learning (ML), Extended Reality, Digital Trust, 3D Printing, Genomics, New Energy Solutions, Robotic Process Automation (RPA), Edge Computing, Quantum Computing, Virtual Reality and Augmented Reality, Blockchain, Internet of Things (IoT), 5G, Cyber Security, and other emerging technology trends are all on the way [162].

7. Challenges from AGI

AGI (Artificial General Intelligence) refers to an autonomous system that surpasses humans in the most economically valuable jobs [163]. AGI is a fictional intelligent agent. The premise behind AGI is that it can learn to do any intellectual endeavor that humans or animals can [164]. AGI is a popular theme in science fiction these days. Strong AI [165], complete AI [166], and general intelligent action [167] are other terms for AGI. Strong AI, often known as artificial AGI or general AI, is a theoretical kind of AI that is used to represent a certain paradigm of AI research. Some AI research and firms, such as OpenAI [168], DeepMind, and Anthropic [169], have made AGI a core objective. If researchers are successful in developing Strong AI or the machine would require intelligence comparable to humans; it would have a self-aware awareness capable of solving problems, learning, and planning for the future [170]. Actually, we don't know whether current deep learning systems, such as GPT-4, are an early but imperfect version of AGI or whether we need to attempt something different [171]. The question now is whether AGI poses a global threat. Several notable individuals in the area of AI are concerned that superintelligent robots, often known as a singularity, would take over the planet and either render humans wholly dependent on them or eliminate them entirely [172]. A mechanical singularity in engineering is a position or configuration of a mechanism or machine in which the subsequent behavior cannot be anticipated, or the forces or other physical quantities involved become infinite or nondeterministic [173].

Nick Bostrom, a philosopher at the University of Oxford,

defines superintelligence as "any intellect that substantially exceeds the cognitive ability of humans in practically all realms of interest" [174]. Stephen Hawking, the late theoretical physicist, famously stated, "If AI began to develop better AI than human programmers, the consequence may be robots smarter than us by more than we are clever than snails." Elon Musk, the CEO of Twitter, has warned that AGI is the greatest existential threat to humans, adding that 'unrestrained growth of AI poses a possible existential threat to mankind as ChatGPT rises in popularity [175].' Attempts to bring it about, he claims, are akin to "summoning the demon." He has even voiced anxiety that his friend, Google co-founder Larry Page, may unintentionally bring something 'evil' into existence despite his best efforts [176]. Even Gyongyosi is unconcerned about AI predictions, but he believes that at some point, humans will no longer be required to train computers; they will learn and grow on their own. He also said, 'I don't think the methods we're doing now in these areas will lead to machines that decide to kill us. I believe that in five or ten years, I'll have to reconsider that statement because we'll have different methodologies and approaches to these issues.' Even if murdering robots remain fantasy, many individuals believe they will replace humans in many ways.

The Oxford University Future of Humanity Institute released the findings of an AI survey. There were a lot of hopeful folks in this group. According to the majority of respondents, machines will be able to compose school essays by 2026, and self-driving trucks would render truck workers obsolete by 2027. AI will outperform humans in retail by 2031, and by 2049 and 2053, AI might be the next Stephen King and Charlie Teo, respectively [177]. To imply that all human employment may be mechanized by 2137 is a little harsh. The question is, what will happen to humans? Diego Klabjan, a Northwestern University professor and the original director of the school's Master of Science in Analytics program, is an AGI skeptic or disbeliever. 'Currently, computers can manage little more than 10,000 words,' he says. So, a few million neurons of a future robot; however human brains have billions of neurons connected in a highly exciting and complicated fashion, but present state-of-the-art technology is basically straight forward connections following very simple patterns. So I don't see moving from a few million neurons to billions of neurons with present hardware and software technology.' 'The actual threat from AI isn't malice, as in dumb Hollywood movies, but competence AI attaining goals that just aren't aligned with ours,' stated MIT physics professor and renowned AI researcher Max Tegmark in 2018. According to another AI scientist, Laird, "I absolutely don't envisage a moment when something wakes up and declares that it wants to take over the world." That, I believe, is science fiction, and it will not occur.' Laird's primary concern isn't malevolent AI, but 'evil people utilizing AI as a type of fake force multiplier' to rob banks and steal credit cards, among other things. So, while he complains about how slowly things change, AI's gradual growth may be a beneficial thing.

'Perhaps what we need is time to grasp what we're producing and how we're going to work it into society,' he added. But no one is certain. In reality, multiple major breakthroughs are required, and they must occur rapidly. In 1917, Ernest Rutherford, a British physicist, stated, 'It's very, very difficult to predict when these conceptual breakthroughs will occur [178].'

8. Future Prepared with AGI Reality

The question today is whether the ethical use of AGI should be controlled, which includes attempting to minimize data bias, which corrupts algorithms and has become a thorn in the AI ointment. This entails creating and strengthening security mechanisms capable of keeping technology under control. In his TED Talk, Tegmark noted, "And it takes humility to know that just because we can, doesn't mean we should." 'Most AGI researchers predict AGI within decades, and if we just stumble into this unprepared, it would most likely be the biggest miscalculation in human history [179].' It might result in a terrible global system with greater inequality, surveillance, and agony than ever before, and even the extinction of the human species. But if we tread cautiously, we may end up in a wonderful future in which everyone is better off; the poor are wealthier, the affluent are richer, and everyone is healthy and free to pursue their goals [180]. The notion that "AI presents an existential menace to humanity" demands much more research [181]. Though it is contentious, many famous intellectuals, tech titan owners, and public celebrities have embraced it, including Elon Musk [182], Bill Gates [183], and Stephen Hawking [184]. AI researchers such as Stuart J. Russell [185], Roman Yampolskiy [186], and Alexey Turchin [187] embrace the core premise and proposal of a possible threat to mankind [188]. Others, like as Bill Gates, claim that "people understand; but why are some people not worried [189]." In a 2014 commentary, Stephen Hawking decried widespread apathy. As a result, when presented with potential futures with immeasurable rewards and hazards, professionals frequently go to great lengths to assure the greatest outcome, whether or not this is accurate! 'If a better extraterrestrial culture gave us a message saying we'll come in a few decades, we'd arrive in a few decades,' Stephen Hawking stated. Would it sufficient to say, 'OK, contact us when you come; we'll leave the lights on?' Most likely not, yet this is the case with AI [190]. The fate of mankind has been linked to that of gorillas threatened by human actions on occasion. Humans have surpassed gorillas in intelligence, making them vulnerable in ways they could not have predicted [191]. The gorilla has become an endangered species as a result of human activity, not out of malice [192].

According to LeCun, those who were concerned that AI would be detrimental to humans did so because they couldn't understand how it might be made safe. 'It's like asking someone in 1930 how to make a turbo-jet safe,' he added. There were no turbojets in 1930, and no AI that could

function like a human. AI will reach the same level of safety and efficiency that turbojets have. A skeptic, YannLeCun, believes that AGIs will not seek to reign over humans and that we should not give them human characteristics or try to figure out what they want in the same manner that we do with humans. People will not be "clever enough to develop super-smart machines," he claims, but will be "so stupid that they will assign them idiotic goals with no safety safeguards [193]." On the other hand, the idea of instrumental convergence implies that intelligent agents will have motives to want to survive and gain more power as intermediary stages to accomplishing these objectives, regardless of their intentions. And having feelings is not required. Nick Bostrom presents the paper clip optimizer thought experiment [194]. Assume we have an AI whose sole objective is to produce as many paper clips as feasible. The AI will quickly learn that it would be far nicer if there were no humans, and it will be deactivated.

AGI removing itself from the control of human Owners/managers will be assigned or create risky ambitions. So, the development of dangerous AGI, or AGIs with bad ethics, morals, and values, or inadequate AGI management would produce existential dangers and possible threats, which will always be seen as AGI risks [195]. Many scholars who are concerned about existential risk support research into solving the hard 'control problem' to answer questions like, what kinds of safeguards, algorithms, or architectures can programmers use to increase the likelihood that their AI will continue to act in a friendly, rather than destructive, manner after it reaches superintelligence [196]? The AI arms race will almost certainly result in the militarization and weaponization of AGI [197] by more than one nation-state, resulting in AGI-enabled warfare and, in the case of AI misalignment, AGI-directed warfare, potentially against all humanity [198]. Others contend that AI poses an existential threat. Skeptics have accused the concept of being crypto-religious, with an irrational belief in superintelligence replacing an irrational belief in an omnipotent God. Jaron Lanier stated in 2014 that the assumption that then-current robots were intelligent is 'an illusion' and a'stunning deception' performed by the rich [199]. Many critics believe that AGI is unlikely to occur in the foreseeable future. According to Gordon Bell, a computer scientist, mankind will kill themselves before reaching the artificial singularity. Former Baidu Vice President and Chief Scientist Andrew Ng stated in 2015 that 'fretting about AI existential peril is like worrying about overcrowding on Mars when we haven't even set foot on the planet [200].'

In contrast, in 2023, the CEOs of Google DeepMind, OpenAI, and Anthropic, as well as other industry leaders and researchers, issued a joint statement stating that 'mitigating the risk of extinction from AI should be a global priority alongside other societal-scale risks such as pandemics and nuclear war [201].' Increased revenues and employment of AI technological professionals within current enterprises, as well as the possible formation of wholly new economic activities in any country's society, may emerge from the expansion of AI producing sectors. Productivity gains in existing industries may be obtained through faster and more efficient processes and decision making, as well as enhanced AI technology expertise and access to relevant information in communities [202]. Mathematicians, accountants, and web designers appear to be the most affected [203]. AGI could increase the autonomy of these systems, letting them to make decisions, interact with other computer tools, and even control robotized bodies. We all know that AI is improving by the day in a world of Google Glass, big data, brilliant algorithms, and Sire. These smart technology and programs may make our lives easier, but they may also endanger us. It has the potential to cause widespread unemployment in the near future [204].

9. Consequence of Global Future

With each new use of AI, the terrifying question of whether or not robots will replace humans arises. The judges have not yet made up their minds. Some academics vehemently oppose the notion that AI would automate so many jobs that millions of people will lose their jobs. Other experts, on the other hand, believe that this is a severe problem. Social experts and AI enthusiasts believed that the workforce was changing and that AI was essentially taking over jobs. It enables us to truly develop a market based on knowledge and use it to improve automation for a better way of life. Although it may sound a little abstract, we should be concerned about AI and robots taking our employment [205]. However, other experts believe algorithms are to blame for the loss of white-collar jobs such as business analysts, hedge fund managers, and lawyers. Again, experts vary on how the rise of AI will effect the workforce, but they do agree on several themes to watch for. On the other side, some experts believe that integrating AI into the workplace will actually produce more jobs, at least in the short future. Wilson believes that the shift to AI-based systems will result in the creation of new jobs that will aid in the transition. Some further experts AI will create more wealth than it consumes. However, it may not be distributed evenly at first. Subtle changes will be felt but will not be apparent. A tax accountant will not be given a pink slip and will not have to deal with the robot who will now sit at her desk. It is probable that the next time the tax accountant seeks for a job, he or she will have a harder problem finding the same one. Few optimistic analysts anticipate that artificial intelligence (AI) in the workplace will fragment long-standing procedures, resulting in the formation of many new human vocations to unite such workflows and provide satisfaction and growth.
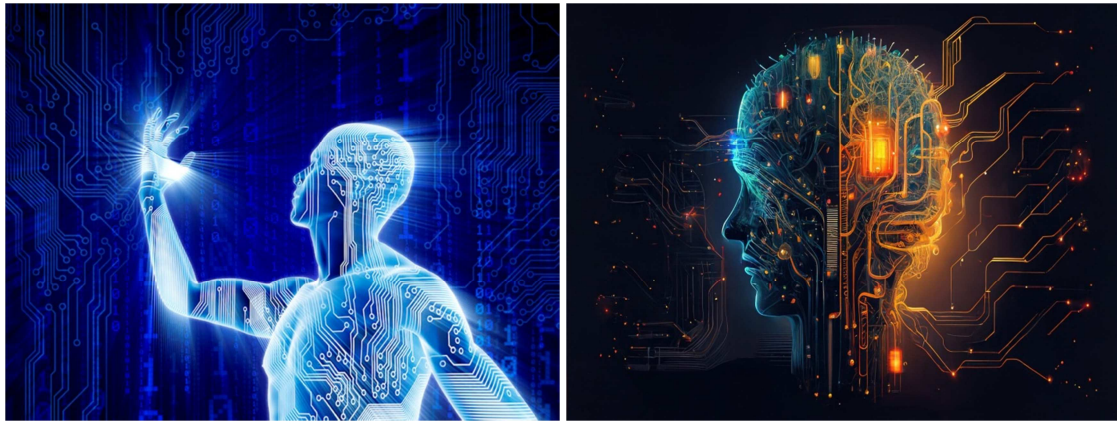
Figure 4. AI and Singularity: A threat to humanity or a promise of a better future [206, 207].

The era of AI in the age of 4IR is a transition, and it may take years, if not decades, for various segments of the workforce and practically every aspect of life to adjust. As a result, these forecasts are more difficult to make, but some pessimistic experts fear that once AI is ubiquitous, these new occupations, as well as those that now exist, will begin to disappear. As a result, they are concerned about what will happen to those folks in the long run. As we have seen in the past, there are ways to transition from farming to manufacturing to delivering services. That is not correct. Now, the big concern is what will happen to the majority of humans who work if robots take over all jobs? As we've seen, technology makes greater sense in terms of business. Self-driving cars and AI concierges like Sire and Cortana, for example, might eliminate up to 8 million jobs in the United States alone as these technologies improve. How about the rest of the planet? When all of these jobs disappear, we'll have to ask ourselves, 'What makes us useful [208]?' What is the definition of productivity? We must confront the ever-changing reality and reconsider the pillars upon which our civilisation is constructed. What is it that we can do to help society and make ourselves important as individuals? We must conclude this discussion because technology will not wait for us. It's time to cultivate a moonshot mindset [209]. To create inclusive, 'decentralized intelligent digital networks endowed with empathy [210]' that assist humans in ensuring that technology satisfies social and ethical duties [211]. To ensure the best use of AI for the entire human species, we need a new and effective level of regulatory and certification process [212].

AI could be data-driven as well as knowledge-driven. The next-generation AI breakthrough is knowledge inference and its applicability to all circumstances. Several key concerns about machine learning in 5G and future networks may give rise to new areas of research and extensions of current standards to support future networks [213]. So, if AI is to be widely used and improved, there must be a strong assurance of security. Because AI will be utilized in transportation and health care in the next years, it must be presented in a way that fosters trust and understanding while also protecting human and civil rights [214]. Policies and protocols, on the other hand, should address ethical, privacy, and security concerns. As a result, multinational communities should collaborate to push AI forward in a way that benefits humanity. As AI gets more integrated into the workforce, it becomes unlikely that all human employment will be removed. Instead, many experts anticipate that the workforce will become more specialized in the future. These professions will require more of what automation cannot currently provide, such as creativity, problem-solving, and qualitative abilities. Essentially, there will always be a need for people in the sector, but their roles may shift as technology improves. Specific skill sets will be in higher demand, and many of these vocations will require a more advanced, technical skill set.

AI is influencing the future of humanity in practically every industry. AI is already the primary driver of developing technologies such as machine learning, big data, robots, and the Internet of Things, and these are generative AI, with tools such as ChatGPT and AI art generators gaining public attention, and it will continue to act as a technical innovator for the foreseeable future. Approximately 44% of firms intend to make significant investments in AI and integrate it into their operations. In addition, 2,300 of the 9,130 patents issued to IBM inventors in 2021 were AI-related [215]. Elon Musk reportedly stated that the robot will be friendly, standing at a height of 5' 8" and reaching speeds of up to 5 miles per hour. However, if all goes as planned, it will eliminate many employment. While Musk's robot has yet to take over, businesses around the country are turning to automation rather than paying people to do work. For example, Insider previously reported that restaurants that are having difficulty hiring personnel have switched to QR codes where diners can read menus rather than having a waiter bring them one [216]. For example, Cracker Barrel launched a mobile app that allows customers to pay for meals; McDonald's began testing automated drive-thru ordering at 10 Chicago locations; and Dave & Buster's plans to expand contactless ordering, effectively eliminating many restaurant jobs previously performed by humans [217]. Every year, all of the world's largest corporations invest billions of dollars on AI products and services. Global AI spending is expected to reach $434 billion by 2022. [218]. According to International Data Corporation (IDC), the market is estimated to surpass $500

billion by 2023. Big things are bound to happen as a result of tech behemoths like Google, Apple, Microsoft, and Amazon spending billions to develop such products and services, colleges making AI a more prominent part of their curricula, and the United States Department of Defense increasing its AI game. ML, in the form of connectionist theories that model computing loosely along the lines of neurons in the brain, has gone through boom and bust cycles, initially flowering with Frank Rosenblatt's perceptron in the late 1950s, cooling in the late 1960s, emerging again in the late 1980s only to fall out of favor again, and now suddenly returning in the last few years [219]. Andrew Ng, former Google Brain head and Baidu top scientist, told ZDNet, 'We may be in the endless spring of AI [220].'

10. Conclusion

We can do a lot with AI to improve the quality of our services and the success of our business, corporation, or organization. If AI is used correctly, it will help us to increase productivity across all departments, increase sales and customer satisfaction, and make better use of our resources. This is why artificial intelligence is being employed by so many different types of enterprises and organizations these days. Automotive, healthcare, finance, manufacturing, energy, agriculture, military, telecommunications, cybersecurity, and other industries are examples of these areas. Today, AI is proving to be a true game changer in the realm of health care. It is enhancing practically every aspect of the company, from the security of private documents to the use of robots to assist with procedures. In most nations, increasing automation in manufacturing might lead wage disparities to expand, labor demand to fall, and skill primacy to rise. The worst-case scenario is that most of the gains made in development and poverty reduction during the last 50 years would be lost. Historically, new technology resulted in more shared wealth and greater equality between and within countries.

The future challenge of AI in general and AGI in particular, will be more distinct and worrisome. Because of the overuse of AI, white collar and middle-class occupations will be jeopardized in the near future. Service and care occupations, on the other hand, are likely to witness an increase in demand. AI, IoT, ML, big data, and automation will undoubtedly lessen the necessity for human employment as well as the size of the economy. Again, the extreme difficulty of AI/AGI is the 'Singularity,' in which AI machines take over and drastically transform human existence, either by making us dependent on them or completely destroying us. Another serious threat to humanity exists on a worldwide scale. Again, the extinction of humanity is possible at any point if super-intelligent robots obtain access to nuclear weapons or develop mass-scale biological or chemical agents. Those heinous or dreadful activities could be carried out at any time, either by extremely intelligent robots or by some uninformed or criminal acting in wrath, malice, or stupidity. To lead AI use and growth in a constructive humane route, there should be global coordination,

legislation, and rules. As AI becomes increasingly prevalent in the workplace, humans will be required in some capacity. However, repetitive jobs, continuous or boring tasks, mass manufacturing, line production, and hard jobs will be taken over by robots or AI-powered machinery, equipment, households, systems, and so on. However, powerful AI or superintelligent robots cannot imitate creativity, complicated problem solving, and qualitative qualities, hence humans will be in higher demand in these areas. As a result, there will always be a need for workers, even if their exact roles may alter as technology advances. The types of skills in demand will change, and many of these occupations will require a higher level of technological ability.

During the epidemic, advances in AI, robotics, and automation have been rapid. Robotics and artificial intelligence are increasingly replacing jobs lost during the pandemic. The use of digital infrastructure across all industries has revolutionized how we function and enabled new cross-border collaborations. The amount of new information available to leaders is rapidly increasing. To effectively lead in the 2020s and beyond, businesses and governments must consume, assess, and act on data in real time. Effective leadership is built on good information, and we need more data as well as the right technology to put it to use. Employment in ICT-related industries expanded the greatest during the epidemic, according to the International Labor Organization (ILO). As digitization and the smart world develop across all businesses and service sectors, demand for digital, IoT, AI, and ML skilled workers will continue to climb. While many current vocations may be eliminated as a result of digital, automation, and economic changes, new ones will emerge in the world of digital and smart technology. Future jobs will require digital and smart skills ranging from basic to advanced. New technologies, solutions, platforms, and services that have flourished since early 2020 will become the new normal in the post-pandemic world. Digitization and smart technology will eventually need more advanced digital and smart skills, knowledge, and capabilities in the regions, sectors, and vocations where job growth is encouraged. Once again, such a shift opens up significant prospects for investment in training and skilling. Education, training, and learning sectors must be prepared and developed to face future challenges.

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