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Convergence and Divergence of Artificial Intelligence

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Abstract: Artificial intelligence (AI) is an important technology that supports daily social life and economic activities. It contributes greatly to the sustainable growth of country's economy and solves various social problems. In recent years, AI has attracted attention as a key for growth in developed countries such as Europe and the United States and developing countries such as China and India.
The attention has been focused mainly on developing new artificial intelligence information communication technology (ICT) and robot technology (RT). Although recently developed AI technology certainly excels in extracting certain patterns, there are many limitations.
Most ICT models are overly dependent on big data, lack a self-idea function, and are complicated. Innovative technologies, such as corporate cooperation and deep learning, are emerging. In this paper, we are mainly focusing on the broader and narrower range of artificial intelligence field, its utilities highlighting its computing power, its smart devices and future advancements. Along with brighter side, this paper put some light on the undesirable effects of artificial intelligence.
Keywords: Smart devices, SIRI, ALEXA, SOPHIA, ANN, Fuzzy systems, Deep-learning

I. INTRODUCTION

The idea of making machines intelligent was put forward a long time ago. The idea of machines operating like human beings began to be the center of scientist's mind and whether if it is possible to make machines having the same ability to think and learn by itself was introduced by the mathematician Alan Turing [1].

Alan Turing performed a series of tests and put forward his hypothesis, "*machines can think ?*". Later, many scientists performed many computations in order to unveil certain possibilities of the same. AI is a widespread field that involves many algorithms like Ant Colony Algorithm, Immune Algorithm, Fuzzy Algorithm, Decision Tree, Genetic Algorithm, Particle Swarm Algorithm, Neural Network, Deep Learning [2] to reason out like humans. Over the past few years smart assistants are becoming a very common technology in most of the smart devices and most importantly, that these assistants are getting smarter than ever. In addition to the awesome help they provide us with, is that every one of these apps has unique features.

Professor J. McCarthy of Stanford University defined AI as the capacity of machines to understand, think, and learn like human beings. Since 1970s, the leading companies began to spearhead their research in areas like machine learning, pattern recognition, expert systems and robotics [3]. The market and business for AI technologies is changing rapidly.

In addition to speculation and increased media attention, many start-up companies and Internet giants are racing to acquire AI technologies in business investment.

According to the venture company CB, all the leading companies like Google, Twitter, Intel, Microsoft, Apple and all other leading IT companies are spending millions of dollars on smart devices. IBM developed Watson system using AI [4]. It is used to screen millions of records of cancer patients to track their histories of cancer treatment. This is leading to improvement in therapy and clinical diagnosis. Google used AI for developing Google glasses that capture live recordings of surroundings automatically, for self-driving cars and other such project [5].

Google developed AlphaGo, a game-playing program which trains itself in improving game strategies. In 2016, AlphaGo defeated Sedol Lee, the world Go champion.

This victory of system over man shocked the world. It attracted global attention to AI. Some critics opined that further developments in AI could lead to the destruction of human race [6]. Data is not only becoming more available but also more understandable to computers [7]. Many people are apprehensive of these developments. They opine that robots will replace human beings in many fields with the help of advanced Artificial Intelligence and threaten the very survival of human beings in future.

II. LITERATURE SURVEY

Mariam Khaled Alsedrah [2017] [1]: AI offers reliability, cost- effectiveness, solve complicated problems, and make decisions; in addition, AI restrict data from getting lost. AI is applied nowadays in most fields whether business or engineering. One of the great tools in AI is called "reinforcement learning" which is based on testing success and failure in real life to increase the reliability of applications. Unfortunately, AI is limited with its capability and functionality. AI nowadays is being implemented in almost every field of study through several models such as SVM and ANN. We should be able to proceed with knowing and understanding the consequences of every technological trend. In my opinion, we are in the AI revelation era and therefore; we should adopt into this change and welcome it too by embracing AI and moving toward a better society. Shally Hudson [2020] [3]: Emotion recognition and cognitive robotics are part of compassionate AI and artificial robotics psychology. Modern, health care robots, social robots, old care robots, child-care robots, nursing robots, and service robots require more compassion, artificial social intelligence, and artificial emotional intelligence. A theory of mind is necessary for the development of empathy; essential for the development of empathy; amygdala damage is associated with deficits in theory of mind development. They might finally realize a dream that is as old as the golem of Jewish folklore and as current as blockbuster science fiction: robots that understand human emotions, and that can adapt to new environments and unexpected situations. There is a need to intensify research on human-robot interaction, greater focus on monitoring robots, and emotion analysis to overcome the psychological barriers that need to be surmounted to achieve more tolerance and higher acceptance of robots.

SéverinLemaignan et al.[2017] [8]: Human–Robot Interaction (HRI) represents a challenge for Artificial Intelligence (AI). It lays at the crossroad of many sub-domains of AI and,in effect, it calls for their integration: modelling humans and human cognition; acquiring, representing, manipulating in a tractable way abstract knowledge at the human level; reasoning on this knowledge to make decisions; eventually instantiating those decisions into physical actions both legible to and in coordination with humans. Many AI techniques are mandated, from visual processing to symbolic reasoning, from task planning to theory of mindbuilding, from reactive control to action recognition and learning. There is also extensive work to be done in order to refine the notion of "good shared plan" and "good/acceptable robot behaviour" in this context. There are large avenues for learning and adaptation in this context. Another direction to head to deals with context representation. Contexts are currently often limited to the current spa-tial and temporal situation. Some of our models offer the possibility to jump in the past or to switch to another agent's perspective, but in our current approach, selecting a context essentially consists in retrieving a set of beliefs correspond-ing to a situation, and temporarily replacing the current beliefs by those other ones. This misses the fact that at a given moment, not one but many contexts co-exist at different scales. We do not want to retrieve one monolithic set of beliefs, but instead carefully craft a context from several atomiccontexts. Techniques for representation of overlapping "pools" of knowledge largely remain to be developed, as well as efficient algorithms to retrieve (or discard) such context-related pools of knowledge. This is a challenge not only for robotics, but more generally for artificial intelligence. Tim Miller[2018] [4]: Despite the recent resurgence of explanation and interpretability in AI, most of the research and practice in this area seems to use the researchers' intuitions of what constitutes a 'good' explanation shows in a small sample that research in explainable AI typically does not cite or build on frameworks of explanation from social science. They argue that this could lead to failure. One may argue that in digital systems, many explanations would be better done in a visual manner, rather than a conversational manner. However, the models of Hilton , Antaki and Leudar , and Walton are all independent of language. They define interactions based on questions and answers, but these need not be verbal. Questions could be asked by interacting with a visual object, and answers could similarly be provided in a visual way. While Grice's maxim are about conversation, they apply just as well to other modes of interaction.

III. POSITIVE IMPACT OF ARTIFICIAL INTELLIGENCE

The following are some artificial intelligence systems developed by organizations to perform specific functions intelligently [5]:

1) *Sophia:* It is a beautiful looking female robot that can talk and express feelings like anger, sadness, happiness, etc. It can socialize with human beings by reacting immediately to the questions posed by other people. The robot has even the distinction of obtaining citizenship from Saudi Arabia.
2) *Siri:* Known as Apple's personal assistant, Siri is the friendly voice-activated computer. It helps us find information that we need, gives us directions to carryout various tasks, send messages to selected contacts, add important events, days, dates etc. to our calendars, give reminders on those days and so on [10].

3) *Alexa:* When Amazon introduced Alexa as a personal Digital Assistant (PDA) for the first time into market, it received overwhelming response from people all over the world. It's ability to understand and follow instructions given by individuals from anywhere in the office room made it the most sought after product of the time.

4) *Boxever:* Boxever is the brainchild of its CEO, Dave O'Flanagan. The travel company seeks to deliver experiences that do not just satisfy but delight the customers. It is using machine learning technology to identify the expectations of customers from the company.

5) *Amazon Rekognition:* Rekognition is used by Amazon to analyze billions of images daily. It helps in detecting objects, scenes, and faces in images, as well as search and compare differences between images. Amazon also uses highly advanced transactional Artificial Intelligence.

6) *Pandora:* At Pandora technology is used to identify songs that have been long forgotten but loved by people if they listen to them. Expert musicians' team at Pandora analyzes the songs based on predetermined musical criteria and selects the best songs. These characteristics are used by the advanced artificial intelligence system to identify the old songs that are not available in the market but appealing to people.

IV.   NEGATIVE IMPACT OF ARTIFICIAL INTELLIGENCE

Artificial intelligence can benefit as well as harm society. The following are the possible negative outcomes of artificial intelligence:

1) *Loss of Jobs:* Artificial Intelligence replaces employees performing specific tasks that can be automated. This will result in loss of many jobs and reduction in income of workforce. Generally, low-skilled workers are the first to be effected by automation.

2) *Loss of Control:* If machines become smarter than human beings, they will no more remain under the control of human beings. This is detrimental to existence of human beings. When machine intelligence exceeds our ability to understand, it is called superior intelligence. We should not blindly depend on machines for execution of entire project.

3) Unforeseen Consequences: There have been many movies about robots turning into killer machines and taking lives of people including its creator. Along with the interesting applications of AI, the undesirable outcomes of artificial intelligence also need to be paid special attention by scientists and engineers.

V.   CONCLUSION

AI offers reliability, cost- effectiveness, solve complicated problems, and make decisions; in addition, AI restrict data from getting lost. AI is applied nowadays in most fields whether business or engineering. One of the great tools in AI is called "reinforcement learning" which is based on testing success and failure in real life to increase the reliability of applications. Unfortunately, AI is limited with its capability and functionality.

Although Artificial Intelligence made our lives much easier and saved us more time than ever, scientists are predicting that by the huge dependency on AI humanity could extinct. Scientists argue that by having a AI machines, people will be jobless and that will conclude in losing the sense of living.

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