

Artificial Intelligence-A Note on the Present Era Deepmind-Prospects and Aspects

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Abstract- An overview on the ruling technology “Artificial Intelligence” whose vision for High level-Perception has been done including its controversies. However, AI has reached its peak, the inventions like “Norman” done by MIT, which is a psychopathic robot has turned the vision or view of the entire community over AI. The AI Machines like “Cozmo” and “Moley”, who are being perfect in their purpose of creation has become an attention seeker in the views of the society. On the other hand “Deepmind” technologies explodes its perspectives and aspects towards every nook and corner of the people’s real time problems in daily life.”Alphago”, the master game being a Deepmind machine, has won the epic strong players of the game, taking AI to the top of the ladder. Notably, Deepmind technology with its amazing Neural Networks is ruling the medical society by completely changing the Lifestyle of patients. An Accurate and undoubted medicine system for everyone will be the future system which will be a dream come true for us. The future scope of AI would be a well-developed ‘AI Precision Farming’ and a strong Cyber security system which reduces the risk of Danger and a Well-developed Medicine system which will be a resolution of all the Social Problems.

Keywords- Deepmind, Artificial Intelligence (AI), Precision medicine, Cyber security.

I. INTRODUCTION

Starting from the recent successive growth of Artificial intelligence, I have analysed the cognitive benefits of the real life role of AI and its views. Nowadays the gossips about it has become a matter of discussion like “Does AI has a gender problem?” “Has AI become a feminist revolution?” and so on. Formerly the father of Artificial intelligence Dr John McCarthy who coined the term ‘Artificial intelligence’, defines it as “the science and engineering of making intelligent machines”. In other words “The term AI is also used to describe a property of machine or programs; the intelligence that the system demonstrates.” This paper is nearly an overview of few goals which are in progress and those ideas which were predominantly succeeded in their path of self-learning automated world, which the AI has praised. For these reasons this work should be viewed as merely snapshot of an on-going credit assignment process of AI.

II. METHODOLOGY

2.1 OBJECTIVES:

- To have an overview on the progressive rise of AI and the role of scientists in it.
- Case study of the successful real life AI machines and their learning Prospects and aspects.
- Perspectives of ‘Alphago’ -A masterpiece of Deep mind.

- Trace out the controversies of AI machines and their cause.
- Future scope of Deep mind with Precision Farming and Precision Medicine and cyber security.

2.2 NOTABLE INCIDENTS IN HISTORY OF AI

YEAR	SCIENTIST/FINDING
1950	Alan Turing proposes the Turing test ^[1]
1956	The Dartmouth summer AI conference of IBM and Claude Shannon. McCarthy coins the term “Artificial Intelligence” ^[2]
1958	John McCarthy invented LISP programming Language.
1959	John McCarthy and Marvin Minsky founded MIT AI Lab.
1965	Joseph Weizenbaum9MIT0 built ELIZA, an interactive program
1968	Richard Greenblatt at MIT built a knowledge-based Chess playing program, MacHack.
1969	Stanford Research Institute, demonstrated combining animal locomotion perception and problem solving.
1974	Ted Shortliffe’s PhD dissertation on the MYCIN program(Stanford)
1978	Tom Mitchell, at Stanford, invented the concept of Version spaces.
1979	Cordell Green, David Barstow, Elaine Kant at Stanford demonstrated CHI system for Automatic programming.
1980	LISP machines developed and marketed. First expert system shells and commercial applications

Mid 1980's	Neural Networks became widely used with back propagation algorithm
1985	The autonomous drawing program, AARON, created by Harold Cohen.
1987	Rodney Brooks introduced the subsumption architecture and behaviour based robotics as a model of Natural Intelligence; Nouvelle AI.
1989	Dean Pomerleau at CMU creates ALVINN (An Autonomous Land Vehicle in a Neural network)
1990	Advancements in all AI areas like Machine learning, Intelligent tutoring, virtual reality and so on.
1991	DART scheduling application deployed in the first Gulf war
1993	Ian Horswill extended behaviour based robot, Polly.
1995	"No Hands Across America": A semi-autonomous car drove across US.
1997	The Deep Blue chess machine (IBM) defeats the world chess champion, Garry Kasparov.
1999	Sony introduces domestic robot similar to Furby, the AIBO.
2000	The Nomad robot explores remote regions of Antarctica for meteorite samples.
2002	iRobot's Roomba autonomously vacuums the floor while navigating
2005	Honda's ASIMO robot, walk as fast as humans; Blue brain a project to simulate the brain at molecular detail ^[3]
2009	Google builds Self Driving Car ^[4]
2010	Microsoft launched Kinect for Xbox 360 ^[5]
2011	IBM watson' computer defeated television game show Jeopardy! Champions Rutter and Jennings.
2011-2014	Apple's Siri (2011), Google's Google Now (2012) and Microsoft's Cortana (2014) that use natural language to answer questions.
2016	Google DeepMind's Alphago (Version: Lee) ^[6] defeated Lee sedol
2017	Google DeepMind revealed Alpha Go zero ^[7]
2018	Announcement of Google Duplex ^[8]

2.3 CASE STUDY:

1. AI MachineName: Cozmo(A robot)

Scientists invented: Mark palatucci, Hans Tappeiner, Boris softman.

Laboratory: Anki laboratories.

Year of experimentation: October,2016.

About:Unlike its less sophisticated predecessors in the toy mark,Cozmo has advanced software to backup its smarts.Anki has programmed the robot which is called an "Emotion engine". That means Cozmo can react to situations as a human would, with a full range of emotions from happy and calm to frustrated and bold.

Areas on Development process: Cozmo is being designed in progress to teach coding to the kids.

Description: It is working on the basis of Facial recognition, Speech recognition, Self-learning and many AI perspectives are being combined in the making of this robot.

2. AI Machine: Moley (cooking robot)

Scientists:Dr.Mark Oleynik

Laboratory:Moley laboratories.

Year of invention:May 2015.

About:Learning of Recipe's and food dishes, Moley has become the world's first fully automated and intelligent Cooking robot.It can mimic the actions of a master chef and clear up the vessels after cooking.The system comprises a full suite of appliances,cabinetry,safety features,computing and robotic technologies.

Areas and Development Process: The plan is to offer a digital library of recipes from around the world.

Description: The moley robotic kitchen does not cook like a machine-it captures human skill in motion. Tim Anderson, culinary innovator and winner of the prestigious BBC Master Chef competition (2011) played an integral role in the kitchen's development process.

III. NORMAN AND ITS VIEW OF CREATION

Norman is an AI that is trained to perform image captioning; a popular deep learning method of generating a textual description of an image. MIT has created Norman and trained on image captions from an infamous subreddit that is dedicated to documenting and observing the disturbing reality of death. Norman is represented as the world's first psychopath AI and was influenced by the fact that the data used to teach a machine learning algorithm can be biased and unfair, the culprit is often not the algorithm itself, but the biased data that was fed to it. The same method can see very different things in an image, even "sick" things, if trained on the wrong (or, the right!) dataset. Norman suffered from extended exposure to the darkest corners of Reddit, and represents a case study on the dangers of artificial intelligence gone wrong when biased data is used in machine learning algorithms.

IV. DEEP MIND: AN MASTERPIECE OF AI

THE ORIGIN:Deepmind technologies is a british AI company founded inSeptember 2010^[11].Acquired by Google in 2014, the company has created a neural network that learns how to play video games in a fashion similar to that of humans^[12], as well as a Neural Turing machine^[13], or a neural network that may be able to access an external memory like a conventional Turing machine, resulting in a computer that mimics the short-term memory of the human brain^[14].The company made headlines in 2016 after its AlphaGo program beat a human professional Go player for the first time in October 2015^[15] and again AlphaGo beats Lee Sedol the world champion.A more generic

program, AlphaZero, beat the most powerful programs playing go, chess and shogi (Japanese chess) after a few hours of play against itself using reinforcement learning.

V. RESULTS AND DISCUSSION

5.1 APPLICATIONS IN HEALTHCARE:

In collaboration between deepMind and hospitals like MoorFields eye hospital and NHS have announced to develop AI applications for healthcare.

5.2 Reports on collaboration:

The NHS is treating around one million people every 36 hours (NHS call to action, 2013).300,000 patients have a test taken every day (NHS National Pathology Programme, 2014).

In 2013,there were 5.3 million emergency admissions to hospitals in total; this is an increase of 47% over the last 15 years (BMA, 2013).At least an additional 6.2 million bed days will be required by 2022.This is equivalent to 17,000 beds, or 22 new hospitals with 800 beds each (Nuffield Trust,NHS Hospitals Under Pressure, 2014).

A 2016 report by the Royal College of Radiologists found that 230,000 patients are waiting ‘too long’ for their results from scans (Our Patients Are Still Waiting, 2016). 75% (94 of 126 NHS acute trusts assessed by the RCR) of English NHS trusts have a backing of radiology studies (Our Patients Are Still Waiting, 2016).There were 23% more delayed transfers of care in 2016 than in 2015 (NHS Indicators, 2017).

In 2016 the proportion of patients who have waited over 6 weeks for a diagnostic test has varied from 1.1% to 2.1%-above the target of 1%.This is slightly better than in 2015, but much lower than long-term trends. (NHS Indicators, 2017).

Despite \$14.5 being spent over 13 years only 3% of NHS Trusts have met the original National Program for IT in the NHS (NPFIT) (Wachter, 2016).In 2016, many GP practices still received faxed versions of printed consultations from hospital-based specialists (Wachter, 2016).10% of respondents to a US hospital study had experienced more than 20 serious digital health technology-related safety events in the past 5 years (Menon, 2014).

Only half of users report the introduction of new healthcare IT as a positive experience (deveer, 2009).Errors in human factors and inter-clinician communication are among the most common root causes of adverse safety events in hospital (Joint Commission, 2014).

National UK data suggests 1083 safety incidents in the NHS in 2007 were related to use of pagers, of which 7%

resulted in moderate or serious patient harm (NPSA,2007). Where hospitals only supply pagers rather than phones, clinicians use their personal devices to communicate about care. In a survey of 600 doctors by the British Medical Journal, 92% of doctors use their personal mobile for hospital-related work and 64% have it available through hospital switchboard.77% use their personal mobile to discuss patient matters.

48% are prevented from communicating effectively due to poor signal within the hospital.73% feel that traditional beeps should be replaced with new mobile technologies^[16].

VI. DISCUSSION OF CONTROVERSIES

6.1 DATA-SHARING CONTROVERSIES-DEEPMIND:

In April 2016, New Scientist obtained a copy of a data-sharing agreement between DeepMind and the Royal Free London NHS Foundation Trust. The latter operates the three London hospitals where it is estimated that around 1.6 million patients are treated annually. The revelation has exposed that private companies can get a highly sensitive medical data without patient’s consent. The agreement says thatDeepMind Health had access to admissions, discharge and transfer data, accident and emergency, pathology and radiology, and critical care at these hospitals. This also included personal details like whether patients had been diagnosed with HIV, suffered from depression or had ever undergone an abortion or not.. The agreement is seen as controversial and its legality has been questioned^[17].

The concerns were widely reported and have led to a complaint to the Information Commissioner’s Office (ICO)^[18],arguing that the data should be personalised and encrypted.In May 2016, New Scientist again published another article pointing that the project had failed to secure the approval from the Confidentiality Advisory Group^[19] of the Medicines and Healthcare Products Regulatory Agency.In May 2017, Sky News revealed a leaked letter from the National Data Guardian, Dame Fiona Caldicott, mentioning that in her “considered opinion” the data sharing agreement between DeepMind and the Royal Free took place on an “inappropriate legal basis”^[20].The Information Commissioner’s Office ruled in July 2017 that London’s Royal Free hospital failed to comply with the Data Protection Act when it handed over personal data of 1.6 million patients to DeepMind^[21].

6.2 PSYCHOPATHIC REPRESENTATIVES-NORMAN:

MIT’s Norman, an AI personality based on a fictional psychopath produced a singular example of what we have long known in humans with prolonged exposure to violence comes a fractured view of cultural norms and values. This represents a real danger to future exposure and transmission to other AI^[22]. While many researchers

are calling for regulations to ensure safe and ethical AI development, MIT has created one with a psychopathic personality. The scientists, from MIT's unconventional Media Lab, based their AI's personality on serial killer Norman Bates from Hitchcock thriller psycho. Fortunately, MIT promises its AI only a warning about bias and its potential dangers. Norman won't have ^{access} to big red button. Unfortunately, that won't keep less predictable human psychopaths from it^[23].

6.3 RUINING ASPECTS OF AI:

High level perception is making sense of complex data at a conceptual level is fundamental to human cognition. With the high-level perception, chaotic environmental stimuli are organised into mental capabilities that are used throughout cognitive procession. Most of the traditional Artificial intelligence work has ignored the process of high-level perception, by starting with hand-coded representations^[24]. The impacts of recent advances in AI have resulted in a heated debate globally. As science fiction starts to become reality, AI products are slowly taking their places in homes and work places. This is grabbing the attention about the potential detrimental effects of AI on the Job market, or even about the dangers of an AI singularity, where sentient robot takes over the world and destroy humans.

VII. CONCLUSION AND FUTURE SCOPE

7.1 FUTURE SCOPE:

7.1.1 Precision Medicine:

AI is driving and spreading its applications for the adoption and implementation of precision medicine, a rising approach for the disease treatment and prevention where individual variability in genes, environment and lifestyle for each person are taken into account. Think of it as a type of medical personalisation. For example, around 25,000 people in the US are diagnosed with brain tumors every year. Traditionally, they might all be given the same course treatment to see what might work in a one-size-fits-all approach. Precision medicine will allow doctors and researchers to predict more accurately which treatment and prevention strategies for a particular disease will work in which groups of people.

Many of the answers lie in the vast amount of medical data already collected. Ayasdi uses AI algorithms like deep learning to enable doctors and hospitals to better analyse their data. Through their work, medical practitioners have been able to identify previously unknown diabetes subtypes that could lead to better understanding of therapies that could work better for certain types of patients. Enlitic and IBM are using similar AI algorithms but to detect tumors in radiology scans more accurately and efficiently and even potentially accelerate finding a cure for cancer^[22].

7.1.2 Cyber security and its focus:

There were around 707 million cyber security breaches in 2015, and 554 million in just the first half of 2016^[22]. This has resulted in the rise of scar amongst us. Security teams are facing struggle due to the increasing alerts generated by the traditional tools. The self-learning and automation abilities of the AI help us increase effectiveness and reduce expenses, making us much safer from terrorism or even smaller scale identity theft. AI-based solution existing in the market can be made more proactive and can pre-empt attacks in the pre-execution state by recognizing the patterns and anomalies associated with malicious content. Secureworks uses the predictive capabilities of AI for advanced threat detection on a global scale. Whereas 'Sistscience', 'Cylance' and 'Deep Instinct' are using it for fraud preventions and for endpoint security, like smartphones and laptops^[22]. These technologies will expand the scope and scale of security professionals and make them to detect threats hopefully better before they actually attack.

7.1.3 Precision farming:

Our capacity to keep the food struggle is just going to be a gigantic rise to be kept in pace. To reduce the wastage of resources and to make an effective use of it, the tremendous applications of AI help us achieve our goal. The main issue of Farming is to maintain an eco-friendly relationship mutually making us achieve our food needs. Systems such as 'John Deere's Auto Trac' enable huge machines to plant in an uniform and accurate way and can reduce the overlap in agricultural processes such as tilling, planting, fertilising and cultivating, which in turn reduces the chemicals usage and a raised productivity. 'Cainthus', a machine vision company, has another approach. Using deep learning, it has created a facial features in just six seconds, enabling huge herds to be monitored with minimal human involvement. Soon, they will detect early signs of lameness in a cow based on its body type, and alert the farmer accordingly. As sensors proliferate on farms and drones capture real-time images of the farm conditions covering the vast lands, AI machines will help farmers foresee what their crops and farms are going to need potentially a year in advance, giving them more time to react to adverse conditions^[22].

VIII. CONCLUSION

While these all are valid discussion, I intimate that the focus of AI should not be just on cool home gadgets. Instead AI could be employed fundamentally to rethink how we can solve the world's problems. AI has the potential ability to radiantly develop our life in the problems like health care, education, poverty and security. But the Human Brain consists only about 300 million pattern processors which are responsible for human thoughts. What if we could complement all of our amazing

ideas with not just more data, but also orders of magnitude more data processing capability? Even with today's progressive forms of AI, there is more than enough technology out there to start doing this exactly. There are a variety of industries, where the combination of human skills with AI, are making wonders and could make even more wonder to change the world a better place to live in. Let us give it all in the hands of almighty, "our hearts".

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