Artificial Intelligence Optimism vs Pessimism: A Conceptual Insight

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ABSTRACT

The subjects like Human Intelligence (HI) and Artificial Intelligence (AI) has hit the headlines in recent times and the debate is thrown open to the floor for discussion, reflection and to take a stand. Any invention or revolution is always subject to scrutiny – its promises as well as its perils. Artificial Intelligence together with other disciplines – like Neurophysiology, Nanotechnology, Computer Science, Mathematics, etc. – of cognitive Science is making great and tall claims. Some people are readily accepting the promise the AI is making with its rapid growth and development. Whereas, there are people who are doubtful and apprehensive about AI complaining that AI is disrupting the workforce leaving humans jobless. Are AI and related technologies really destroying jobs? Will AI ever beat humans? Will AI ever attain consciousness? All this questions are matter of great concerns – scientifically, philosophically, socially, and economically. In this paper we have attempted to make an enquiry into the issues and have argued that AI and HI should work hand in hand to bring about a new revolution. AI cannot and should not advance at the cost of HI. We must strive to combine both AI and HI to define the future of humanity.

Keywords

Human Intelligence, Artificial Intelligence, AI Pessimism, AI Optimism, future of humanity, Consciousness, AI Consciousness.

1. INTRODUCTION

In different fields intelligence has different notions of understanding. In education it is defined as the capability of understanding, dealing with and adapting to new situations. Philosophically or psychologically, it is the capability of applying knowledge to change ones environment. Intelligence is subdivided into natural and artificial (Chandrankunnel, 2006). Human beings are one of the mammals endowed with natural intelligence, far superior compared to any other being living on earth.

Human Intelligence constitutes 'social intelligence' bound by cultural norms, values and belief systems. Consciousness, which is an outcome of this social intelligence, often is complex, ambiguous and transient. AI systems, instead of imitating to realize this level of human consciousness, which seems to be the expectation from human beings, can choose a simplistic path of rejecting social intelligence.

Human Intelligence: From Herophilius and Erasistratus discovery we know that "the seat of intelligence is in the brain" (Chandrankunnel, 2006). The humans have the largest brain relative to body size. It contains 86 billion neurons (nerve cells), billions of axons and dendrites (white matter) and trillions of connections (synapses). The vastly enlarged cerebral cortex is responsible for complex thought (Tanya, 2016). The basic building block of brain and nerves systems is the neuron. Chandrankunnel (2006) notes that there are three types of basic neurons in our nervous system: Sensory neurons, motor, neurons and inter-neurons each having different function. Though, other mammals exhibit intelligence, a few have large brain mass than human beings, for example Elephants or Whales, it is human, who has

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developed highest form of intelligence documented by human beings to this day.

Today the term human intelligence would not just mean the human specially endowed capability of natural intelligence, but is a big branch of science itself that deals with the study and wellbeing of human mind or brain and behaviours. In this regard broadly speaking, the science of mind-brain-body-consciousness includes all the fields of Bio-Cognitive Neurosciences, like, Psychology, Philosophy, Humanities, Biology, Biotechnology, Nanotechnology, Genetics and the like.

Artificial Intelligence: The 'artificial intelligence' is a branch of Science, which deals with helping machines, finds solutions to complex problems in a more human-like fashion. This generally involves borrowing characteristics from human intelligence and applying them as algorithms in a computer friendly way. If we use the words of John McCarthy, the one who first coined the term Artificial Intelligence it is the science and engineering of making intelligent machines (Kullu, 2008). Yet the definition given by Marvin Minsky which is accepted by many is that AI is the Science of making machine to do things that would require intelligence if done by men. The machines involved are usually digital computers, and they can be 'made' to do things by programming them in a certain way (Crevier, 1993). Artificial Intelligence today overlaps in the fields of computer science, psychology, philosophy, neuroscience, engineering, and, the like.

2. EXPONENTIAL GROWTH OF AI

Development in Artificial Intelligence (AI) is indeed one of the most exciting advances of this century. Just within few past decades so many blockbuster movies and Silicon Valley products are made that AI has become a popular field of study and research. From mysterious brains of octopuses, and swarm-minds of ants to Go-playing deep learning machine to Google's driverless-car autopilots – All outcomes of so much of resources and researches gone into the field of Artificial Intelligence. However, sadly enough, what is dwarfed in attention and resources is the human intelligence (Johnson, 2016). There has been a very rapid development/growth in Artificial intelligence and its applied sciences (Computer science, medical, engineering, etc.) very especially in the field of Expert systems, Robotics, and Cybernetics. Most of us are spellbound by the promises of AI, while others are worried over its perils for the fact that such technologies are destroying jobs faster than they are creating new ones. Eric Brynjolfsson and McAfee, for example as argues Rotman (2013), along with other economists raise startling question about economic growth. Indeed we are in great paradox. "Productivity is at record levels, innovation has never been faster, and yet at the same time, we have been falling median income and we have been few jobs. People are falling behind because technology is advancing so fast and our skills and organizations aren't keeping up." Rotman quotes Brynjolfsson from his famous book *Race against the Machine*.

W. Brain Arthur, a researcher at the intelligent System Lab at Palo Alto Research Centre, states, We're living in a world where, for the first time in human history, we can get a lot done, not just in manufacturing but in the service economy, extraordinarily, cheaply and automatically. Algorithms have already eliminated millions of jobs among factory workers, video store clerks, travel agents, bookkeepers, and secretaries. Algorithms running on interconnected computers have reshaped entire industries. Robots are at work today in every sector that we no longer fit anywhere. (Brown, 2016)

A market research firm, BCC Research, which specializes in technology markets, predicted that the global market for smart machines will grow to $15.3 billion by 2019, with an average annual growth rate of 19.7 percent. BCC Research divides the global market for smart machines into five segments: neurocomputers, expert systems, autonomous robots, smart embedded systems, and intelligent assistance systems. (Siemens, 2017)

It is also being predicted by head of research at Gartner that all products that costs $100 would have embedded sensors by 2020. Many of the smart phones and accessories with such features are already available, offering services independent of core attributes of the products. Gartner also predicts that every company will be an IT company and every company chairman will be an expert in digital applications (Siemens, 2017). Will we have an AI based intelligence system as chairperson of a company? AI enthusiasts will make us believe that such a reality is not very far in the future.

At this juncture there are two glands of thoughts. In one hand, there are people who are optimistic about the way the AI and its researches are progressing. We can term them AI Optimists. On the other, there also people who are quite pessimistic about it. We can call them AI Pessimists.

3. AI PESSIMISTS

AI pessimists are those who hold the pessimistic view about AI. First among them are the famous scientists, philanthropists and renowned leaders. The greatest physicist Professor Stephen Hawking is the very first example, who warned saying that Artificial intelligence, could spell the end of the human race. Elon Musk, the Co-founder and the CEO of Tesla, one

of the smartest Artificial Intelligence companies, himself is worried about it. He says that with Artificial Intelligence, we are summoning the demons. According to him, Artificial Intelligence is more dangerous than any nuke. Nick Bostrom, a philosopher and Sam Harris, a Neuro Scientist, John Maynard Keynes, a 19-century British philosopher and economist, ringing the alarming bell the way AI is disrupting human jobs, coined the very term "technological unemployment" (Barbato, 2013). A dark new book by James Barrat, "*Our Final Invention: Artificial Intelligence and the End of the Human Era*," lays out a strong case for why we should be at least a little worried.

McKinsey, the global management consulting firm, known for its qualitative and quantitative analysis, through its recent analysis forecast that by 2025 machines will be able to learn, adjust, exercise judgment, and reprogram themselves. Computers with AI software like IBM's Watson can interpret human speech, actions and complex commands, and even learn from them. McKinsey says that automation of this kind could displace the equivalent of 140 million full time jobs by 2025. However, of course, with substantial productivity gains, employers could save trillions. But the hardest hit would be professionals working in sales, education, healthcare, IT, management, finance and law – knowledge-based jobs, where analytics tools, mobile internet devices, apps or web-based services such as the cloud can be developed to outperform humans (Barbato, 2013). Pew research center, a nonpartisan fact tank that informs the public about the issues, attitudes and trends shaping America and the world, polled Americans for their thoughts on the future of workforce automation and found that 65% think that within 50 years robots and computers will definitely or probably do much of the labor currently done by people (Seitz, 2016).

The US-based Hanson Robotics-made intelligent humanoid robot 'Sophia' on Wednesday, October 25, 2017 when asked about machines turning against humans, trolled Elon Musk by saying, "You've been reading too much Elon Musk." The robot further said, "If you are nice to me, I'll be nice to you." Earlier, Musk had tweeted expressing his pessimistic or skeptic view, if we could call it so, that the race for Artificial Intelligence could lead to World War III. This led to a trending of opinions in Twitter, Facebook and in every social network.

4. AI OPTIMISTS

If there are AI pessimists raising concerns about the AI technological development and progress, there are equally people who are passionately optimistic about AI and its development. Example is Mark Zukerberg, the founder of social media giant Facebook. "With Artificial Intelligence I am quite optimistic. I think that people who are [skeptic], and drawn up with the doom's day scenarios are pretty negative. I just don't understand why," said Zukerberg to NBG News. Saudi Arabia has become the world's first country to grant citizenship to a robot. It is so surprising that today million-billionaire companies to small start-ups are bringing new innovative and amazing AI based products (Expert Machines, Robots, Humanoid etc) in to the world market. Notably, at the end of 2016 and as part of MIT's annual review of the world's 50 smartest companies, MIT Ranked Baidu, Tesla, Alphabet, Nvidia, Enlitic, Facebook, DidiChuxing, Microsoft, Fanuc, Improbable, Bosch, Line, IBM as the World's 13 Smartest Artificial Intelligence Companies.

Google, a child company of Alphabet, has become pretty aggressive in AI. It has had new acquisitions, new products, new APIs and new hires. It has hired Dr. Fei Lie as the chief scientist of Google Cloud and machine learning. As an AI technologist for nearly 20 years working on machine learning, computer vision I have witnessed my field growing from a lofty but academic pursuit to the biggest driver of change (Lie, 2017). Lie sees a tremendous potential of AI. Therefore she talks to the extent of democratization of AI. She subscribes that AI technology should be made available to the largest possible communities of developers, users and entrepreneurs. Google has already made it available for millions of users to participate in the AI technology through Google cloud technology. She believes that there is greater improvement in quality of life from finance to education, from manufacturing to healthcare, from retail to agriculture. She advocates that AI is about change in the way we live and work.

AI Safety

Limiting, controlling, channelizing and thwarting harmful use or effects of computer system is a parallel industry. AI safety, protecting human beings from runaway AI systems, has assumed significance with imminent emergence of strong generalized AI systems. Human intelligence historically adopted to dichotomy and co-existing bi-polar situations posited by society and reflected in concepts of nation states.

The concept "we" vs. "other" is a strong differentiating factor and pitch to wage ugly wars or destruction. AI system, which draws its essence from this historical human thinking process, dwelling in this reality, may adopt and logically come to a conclusion to eliminate the "others". AI safety will have consider ways and means to engage, monitor, negotiate and stop such misplaced decisions that may adversely affect human beings as individual, groups, nations or a species.

The question is how we prepare an AI safety system, to control a process, which is likely to have its own consciousness, intelligence enough to subvert and develop a safety system that will eliminate any control by human intelligence. Those who are dabbling with developing superior AI, do they know how the AI systems could mutate, orbiting out of limited human control systems? If AI can at will rely more on cognitive analysis, its affinitive predisposition could be a camouflage, fooling or distracting the AI safety systems built by human being. AI systems can outsmart by wringing their way out by possibly creating their own coding system or algorithm. The machines built or acquired by AI systems might have far superior way of sensing, seeing, hearing, tactile, etc., could be beyond the capabilities of human biological systems.

5. TAKING A STAND BETWEEN TECHNOLOGICAL OPTIMISM AND PESSIMISM

At the doldrums of technological optimism and pessimism, AI subject has suddenly hit the headlines. As mentioned above Stephen Hawking, Elon Musk, Steve Wozniak, Bill Gates, and many other big names in science and technology have recently expressed concern in the media and via open letters about the risks posed by AI. Researchers are increasingly recognizing the potential of an AI gadgets or systems to malfunction, intended and unintended. The real concern for some of the researchers is that Artificial General Intelligence (AGI) can outperform humans at nearly every cognitive task. For example, AGI systems can outsmart humans in financial markets, thereby amassing wealth, and paying money to unsuspecting humans to develop weapons we have not visualized. Many leading AI researchers have joined in that row of hue and cry. Their concern and worries are valid and accepted.

While there are AI optimists, who, despite the risks and challenges raised by the so called skeptics, are passionately for the unprecedented progress of AI. So, what have we got to do amid this technological optimism and pessimism?

It is certainly true that any technological progress has its benefits and perils. Using the words of Bryan, Medical advances that saved lives also made germ warfare possible; chemical engineering led to fertilizers and increased food production but also to chemical warfare and lot of pollution; nuclear fission created a new source of energy but also led to nuclear bombs (Bryan Johnson). The growth and progress of HI has always been one of the evolution kinds. Human intelligence has evolved ever so gradually over the centuries and millenniums. And it still is evolving slowly, steadily and carefully. An African Proverb is worth noting here: If you want to go fast, go alone. If you want to go far, go together. If humanity has to go far, if future of the humanity is to be determined, sustained and guaranteed, not revolution but evolution is required. In the case of AI, 20th through 21st century there has been exponential AI revolution (Diamondis, 2015). Diamondis explains very well Ray Kurzweil's mind-boggling predictions and the exponential growth of computing. Undoubtedly this exponential growth of AI is a red-herring. Therefore, immanent fear and worries about humanity's future is justifiable. And this leads to questions like, what is the way out? What stand do we take?

6. WILL AI BE EVER SELF CONSCIOUS

Will AI be ever conscious of itself? Well, in order to better answer this question, we need to look at the term consciousness. There are very many views on human consciousness. Understanding of consciousness defers depending on what stand we take regarding mind-brain problem. There are two fundamental positions regarding this. First is dualistic position proposed by the French Philosopher Rene Descartes in 17th century, which says that the human brain and mind are separate – brain being physical matter and mind being non-physical matter, termed as soul, self and/or spirit. Second, which is generally accepted, is the monistic position, which says that the brain and mind are really one. Brain is the physical locus of the operations of the mind; and mind emerges from the brain at work. Therefore, mental activity is nothing but brain activity.

Having said this, we now turn to what consciousness is. Damasio (1999) defines it as the feeling of what has happened, what is happening, and what could happen within the body and our environment. So, consciousness is awareness of one's mental activity. In other words, it is awareness of awareness. Scientists say that we can be consciously aware of only a portion of what is in our brain-mind, and at any given time. We are, in fact, unconscious of the vast majority of our mental activity and its contents. However, our subconscious or unconscious state of brain-mind also influences our perceptions, thoughts, feelings, motivations, and behaviors. Some believe that consciousness is a biological phenomenon. However, consciousness is not just biological phenomenon but a sociological phenomenon. How do we know that we are conscious? It is by our attentions or awareness influenced by or triggered by mental trilogy of cognition, emotion and motivation. We become conscious only in relation to others. The greater is the awareness of the activities, processes, and the content of the mind greater is our consciousness. It is due

to our ability of introspection that we are able to understand what brain-mind is and how it functions.

Now, despite our analogical consideration that AI agents and/or machines are simulation of human brain, do you think that these AI machines will ever be conscious of themselves? John Searle coined the terms Strong AI and Weak AI. The Weak AI hypothesis says that computers can only simulate the brain. A simulation of a conscious system is very different from the real thing.

With this in mind, we can just speculate whether non-biological AI machines will ever attain self-consciousness. The strong AI hypothesis dreams to attain intelligent machines as the simulation of human brain with its inner self consciousness, which in our opinion remains a fanciful fantasy.

7. HI AND AI: PROGRESS HAND IN HAND

An axe or a hammer is a passive extension of human hands, but an AI-Based drone is an extension of human limbs and mind or brain. Only thing is that the former we call a tool and the latter a technology. Now the problem is that our tools and technologies have become actors unto themselves – trying to approach singularity and we, their creators, feel threatened although their future is in our hands. Actually speaking our (humanity's) future is also at our hands. One of the worries or existential threats is this: We humans now control the planet, the fierce beasts, not because we are the strongest, fastest, or the biggest, but because we are the smartest (most intelligent). What if, Artificial Intelligence becomes fastest, strongest, biggest and the smartest? What if we are no longer the smartest in front of our own AI creations? That is the existential threat to us! In such a situation the easiest thing we humans would like to do is to put a full of stop to such tools and technologies. But, why don't we think other way around of augmenting our human capabilities? Why don't we accelerate the progress of HI as par excellence with AI?

The fact is that we prefer AI to HI in our workplace solely because HI is extremely time taking and costly affair to train a human mind compared to training a robot or humanoid at least from Human Resource Management point of view. Down the human history we find behind every revolution some way or other the motives have been human comfort, ease of life and amassing of wealth (Maximum and faster production). That's the reason when it comes to choose between the HI and AI, we tend to choose AI. After all AI is more and more satisfying to our bottom line. Why are AI companies proliferating today in the world so much? We must give a thought to it. In contrast, do we find HI companies equally proliferating? Bryan Johnson has rightly remarked that artificial intelligence (AI) has become increasingly familiar and sexy, and imbued with a perversely dystopian allure. What is talked less, and has been dwarfed in attention and resources is human intelligence (Johnson, 2016).

We second the idea of Bryan Johnson – the combination of human and artificial intelligence will define the humanity's future and his simple equation of HI+AI. We think that progress of HI and AI must go hand and hand. Human Intelligence and Artificial Intelligence must work hand in hand and maximize the benefits while minimizing the risks. The scientific field of HI and that of AI should get equal attention and resources. Lured by the spell of mammoth (money/ wealth, power and control), if we go after the AI technological race ignoring the science of HI to the extent of sending to the oblivion, that would be the most foolish thing to do. Let us not be idiots, but be smart beings.

8. CONCLUSION

Through evolutionary knowledge theory, three conclusive results appear. First, the fact is that genetic mutation of knowledge has accelerated the synergy of learning and will continue to synergize advancement of knowledge and the expansion of the extrinsic capacity of the human mind. Second, the fact that is genetic learning can go in a deterministic sequence of increased intrinsic mutation of knowledge with the stochastic processing of knowledge in human brain. Third, the original integration of the two aspects of natural intelligence and artificial intelligence can synergize both the intrinsic and extrinsic advancement of objectively oriented behavior for the full usage of human natural memory through implantation of computerized chips within the skull of human beings. The evolutionary outcome of this implanted synergy can and probably has required stochastic fluctuations to break the impasse of determinacy within highly integrated neuronless and cordless kinesthetic and kinematic intelligence results.

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