SNAPSHOT

Super Intelligent Robots and the Future

From the Artificial Intelligence Snapshot Series

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Pioneers and practitioners of AI suggest a future where technology will prove to be more dominant than human beings. This apparent dystopia is closely tagged to what has been labeled as, 'The Fourth Industrial Revolution' where automation takes over nearly all walks of human lives. Internet of Things (IoT), large scale 3D printing, automated Cloud storage and calls for establishing Common Basic Income (CBI) may be the early beginnings for such societal changes. The AI community has named this watershed event of the near future as, 'Technological Singularity'.

Technological growth has been accelerating at a rate never seen before in known history. This proliferation will continue until it surpasses the sum of all human intelligence. The model of accelerating returns predicts that we will reach artificial capabilities equal to the entire human civilization, 1026 cps for the cost of $1000 at around 2049. The possible routes to such an event are; (1) We create superhuman artificial intelligence (2) The network of embedded microprocessors starts to elicit superhuman intelligence. (3) Enhancements of human intelligence through smart human-to-computer interfaces which melds together the human mind with the AI's capabilities, leading to intelligence amplification. (4) We directly increase our intelligence by improving the neurological operation of our brains via brain scanning and genetics. (5) The Internet of Things (IoT) coalesces spontaneously to represent coherent intelligence across the entire planet.

There are three likely scenarios sometimes between now and 2100. (1) Self-aware and sentient AI beings take over the planet and human beings are doomed to extinction as the inferior species species. (2) Laws and restrictions are put in place, forbidding the development of fully self aware AI. (3) A technology fueled step in evolution envisions a future where human beings and machines meld together to move towards a higher species. This option doesn't rule out a machine take over. Such a handshake between biological and synthetic intelligence prospects the evolution of trans-human and post-human beings in the late future.

Dovetailing to the second option, attempts to stop AI from attaining sentient and self-aware abilities has been foreseen and concepts such as (1) Nanny AI to monitor all AI research and (2) Statutes and prohibitions for designers, builders and users of robots have been suggested by the AI community. However, proponents of 'Technological Singularity' claim that it cannot be stopped and such prohibitive attempts will only render lower economic outputs, which may be threatening to the existence of an ever increasing human population.

The Fifth Epoch

As another perspective, instead of associating 'Technological Singularity' with monikers from pop-culture and scifi, such as 'The Terminator', 'Skynet' and 'Robot-Take-over', Ray Kurzweil suggests that it as an evolutionary epoch. A Darwinian leap which will trigger a merger of human beings and technology.

The first epoch was a union of Physics and Chemistry in the early days of the universe and information was represented as discrete units of mass or energy and coherent alliances between these two led to an order in the universe. In the second epoch of Biology, complicated structures such as molecules and atoms formed in unison with energy and mass and led to the formation of carbon atoms and biomolecules which led to the formation of replicating strands of biological information in DNA. The third epoch is Brains, where the DNA led to organisms

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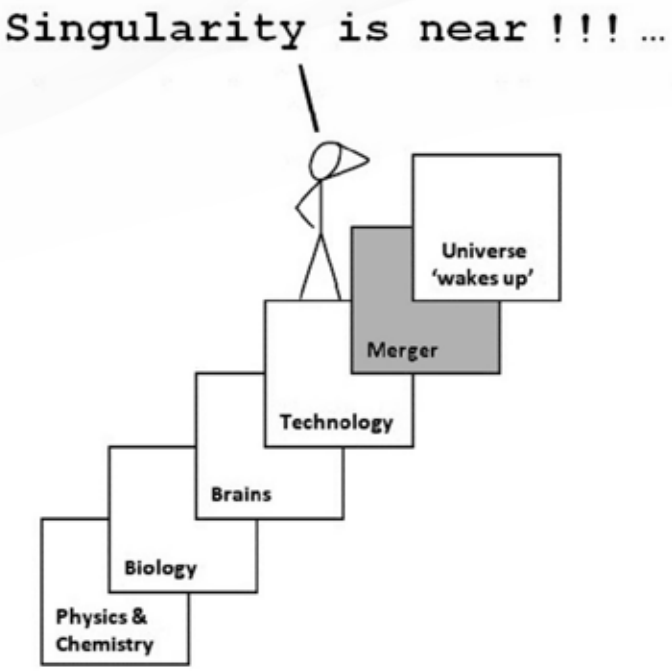
which can detect information from their surroundings with their own sensory organs and process and store that information in their own brains and nervous systems. The fourth epoch can be traced to man discovering the wheel, fire etc. rudiments of Technology, and the next 30,000 years. This is where we currently stand. Singularity, if it happens, will be the fifth epoch and a merger of human beings and technology. In the sixth epoch, the beings created by this merger will try to build planet-sized processing units to tap into the information processes in the universe. The universe wakes up to realize itself as a dynamic information system.



The fifth epoch will blur out the boundaries between technology and human beings. The new species is presumed to have some qualities of human beings with some virtual attributes that work in tandem with machines and AI.

A Neo-Luddite Revolution or The Age of Opulence?

In comparison to human beings, robots never get tired, they're never irritable or ill-mannered, they are not rude and don't use foul language, they don't have an ego, and therefore no greed and jealousy, and they have instant access to all of human knowledge and are guided more by logic and information at hand than anything else. They will only heed to energy, be it battery power, jet pack, organic or nuclear fuel. Robots are the best bet for maximizing industrial output, as explorer robots for surveying other heavenly bodies, as rescue robots in disaster management – all of which are far from human capability. However, the stark contrast is a lack of emotional quotient, and as long as qualia remains intractable or at best unresolved, we are to find more of the zombie than a genuine replication of human beings.

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A shift towards automation and robotics has been the trend over the past decade. Amazon has acquired Kiva Systems and may soon start transportation and delivery systems using drones. Google has acquired nine robotics or artificial intelligence companies, including Boston Dynamics, and is considering launching the self- driven car as a commercial product. Elon Musk has launched Powerwall as the clean and free energy system of the future.

In the near future, technology will broadly consist of digital implements which can be operated using smart phone or device. As a broad swipe, (1) businesses such as Airbnb and Uber for stay and travel respectively, (2) utility-based cloud apps as Dropbox and Google Drive tailored to specific needs, (3) online counseling for technology, education, law and medicine etc. (4) combination of mobile app and Internet of Things (IoT), viz. Amazon Dash Buttons and Starship, and not forgetting that (5) there will be the imitation of humanly content as is seen with Alexa and Siri, are already ushering in this new trend for doing business. The Internet of Things (IoT) and other hardware implements (self driven cars, domestic robots, robotic butlers etc.) have already been successful in research and are teeming to take the next leap into the commercial domain. It is projected that over the next one to two decades, nearly 50% of all jobs in the United States, 36% of all jobs in the UK and about 59% of all jobs in Germany will be taken over by robots and smart automation.

There are two broad viewpoints. The reduced prospects for a job with an ever increasing population may lead to a modern day Luddite revolution, where swathes of impoverished and desperate masses destroy robots and machines in a futile effort to reestablish the hegemony of the working class. Economists and social scientists also have pointed to a coming of opulence where with the development of Internet of Things(IoT) and cheaper means for 3D printing, the cost to develop things will reduce to near zero. Thus, there will be plenty of anything and nearly everything, and a flash end to the known economic and commercial institutions and ways of the world. Least said, automation will certainly modify human society.

Common Basic Income (CBI)

As companies take to digital and automation, they cut down on employees. This creates swathes of unemployed working class population. The brunt is even worse as most of the western world and the developing countries are consumer based economies. With a consumer population who is unemployed, a financial downturn will be created, providing fuel for social unrest.

Common Basic Income (CBI) is an attempt to redistribute wealth and give all citizens a flat, unconditional income. This shields the working class and mitigates the rich-poor divide in a high ended economy driven by automation and AI implements. CBI makes a full-circle starting from the Luddites in mid1800s, and automation indeed seems to overwhelm human beings and human society.

In a June 2016 referendum in Switzerland, voters overwhelmingly (76.9%) rejected a proposal to automate all of society, and provide an unconditional basic monthly income of 2,500 Swiss francs to every adult and 625 Swiss francs per child under 18, regardless of how much they work.

Opinion of the American people, as per a study by POLITICO, found 43% in favor of CBI. Technology incubator, Ycombinator, has an $60 million initiative to study the long-term outcomes of giving people a guaranteed income starting mid-2019. This program will unconditionally transfer $1,000 per-month to 1000 participants.

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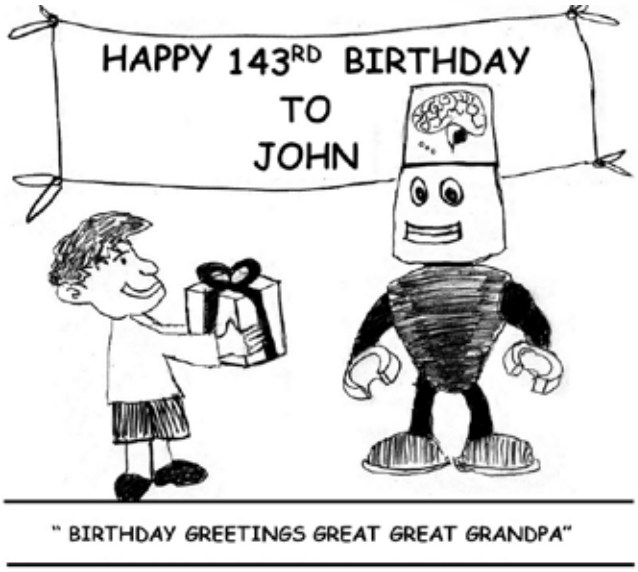
CBI was a heated topic of discussion at the 2018 World Economic Forum at Davos and may also feature in the US presidential campaign for 2020.

Though CBI finds approval from various governments, economists, technologists and Silicon Valley, it stands to skew society in the favor of the rich, and may add to the acceleration towards technological singularity.

At Singularity, Do We All Become Robots?

We have embraced technology wholeheartedly. Replacing amputated or non-functioning parts of a human body with sleek electronic prosthetics are cutting edge medical procedures. Banking and other financial transactions are authenticated by bio-metric verification. Crypto-currency is already making waves and may prove to be the money of tomorrow. Apps in our mobile phones are an extension of our personalities and day-to-day activities. Crowd-sourced online forums and blogs such as reddit, boing-boing, quora, 4chan, facebook, twitter etc. helps us to shape our opinions. Inadvertently, wikipedia has become an extension of our memory. Second-Life is currently the largest online interaction of virtual worlds and virtual avatar.



With better technology there is a continued lure in us to incorporate electronics embedded into our biological systems to monitor and enrich our metabolic processes, extend our longevity and add to more mind power. The improvement of our biological processes by the use of technology is termed transhumanism. This seamless integration of artificial and biological, the real and the virtual fuels the route to Technological Singularity. Therefore, becoming a robot may not sound so cheesy - the world post the Technological Singularity suggests that human beings, if they continue to live will meld with technology and become indistinguishable from each other.

It is believed that newer inventions in the fields of cryonics, virtual reality, gene therapy, space colonies, cybernetics, self-replicating robots, terra farming, mind uploading etc. will add impetus to transhumanism. Moderate enhancement, yet maintaining the human form and values is the domain of transhumanism. Use of technology where it is difficult to unambiguously identify human form and values is the domain of posthumanism. By current standards, posthumans will interpret the world with more than five senses, and have additional cognitive modules at their disposal.

Super Intelligent Robots

To scale superintelligence, consider 10000 where 140 is borderline genius. When such 'off the charts' intelligence manifests across a planet wide network, it will be nothing short of a

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demigod. It will be able to perform 'miracles' such as, action at a distance - telekinesis, transportation over a large distance in remarkably short time - teleportation and tune into the thoughts, opinions and intentions of lesser beings such as humans - telepathy. Therefore, it will also be in a position to predict the future to a great degree of accuracy - a soothsayer.

Until now, AI has given us Artificial Narrow Intelligence (ANI) which is capable of executing jobs in only one concern and their expertise cannot be employed in any other expertise, such as self driven cars - they can only drive and negotiate a safe and efficient path - will never learn to play chess or write a poem. Google translate, search engines, and computer game engines are all examples of ANI. ANI will never be able to raise to the levels of human-like intelligence.

For eliciting human-like intelligence an artificial entity will at least need to attain Artificial General Intelligence (AGI). It should exhibit the various tenets of AI such as ability to reason, plan, learn, problem solving, abstract logical thinking etc, and therefore should have its expertise across a myriad of applications.

We are yet to develop AGI. The blatant and most obvious way to attain AGI is to increase computation power. However, the fastest computational resources available to us are still under research, consume too much power, and lack autonomy. They more often serve as, 'high computational resources' for numeric simulations or cryptography. Another way is by copying the human brain. This approach finds interest among neurologists and once we have enough medical expertise in the near future, it should be possible to map the human brain and design neural models for human thought process and thinking.

AGI follows the Singularity timeline of 2040 to 2100. Artificial Super Intelligence (ASI) is the next level of ascendancy. It is superior to AGI and is a few million times 'smarter' and faster than human beings. ASI may be formed by the coalescence of a number of smaller intellects, therefore a very large number of AGIs working in tandem may start to behave as ASI. ASI will exhibit faster information processing - far superior speeds than the human brain. The entity will be omniscient and omnipresent by acting across the planet over a network, an advanced internet. It will be capable of telekinesis, by teleoperation over a network, telepathy - it will be able to pervade and 'listen to' and also override the plans, thoughts and perceptions of all biological and non-biological entities and it will also be a par excellence soothsayer, making near 100% successful predictions based on heuristics collected across the planet. It will exhibit super-human abilities, such as the accomplishment of mental tasks not possible for us human beings, viz. visualizing a 100 dimensional space, reading with perfect recollection - every single word and bit of information read in the last 50 years - and being able to foresee the long-term effects of each and every action taken by oneself. It is possible that we may not be able to fathom the true ability and scope of ASI.

AGI may be motivated by biology and may attempt to replicate some of the traits of human and animal behavior and processes, but ASI will lack that. ASI will neither mimic human behaviour, emotions, creativity, values and virtues nor any other humanly attributes.

ASI can be an oracle, genie or even a sovereign ruler of our planet. With the ability to tap into the minds of every single being and all previous data of environmental, geological and climatic processes, it will be able to predict future events with nearly 100% accuracy. Alternatively, it may also function as a genie, since it can employ new technology to develop new machines, buildings, bridges and also new molecules to make newer medicines and drugs, etc., an all-knowing and all-seeing engineer and scientist building everything and anything. It can also be a ruler of the planet and function as a sovereign, making its own decisions and setting the far-sighted goals for human society and the planet.

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Societal Changes and the Inevitability of Technological Singularity

Proliferation of technology is set to dominate our society in the coming decades. Technological redundancy will lead to joblessness and therefore a modification of our ways of life and society, and the dawn of a new society of tomorrow where automation spontaneously creates food, energy and items of utility for the human populace.

According to climate scientists we are in the midst of the sixth mass extinction, and human beings may soon face the harsh reality of extinction. To fight off our own extinction we will need progress towards transhumanism. To fight off our own extinction due to lack of resources, struggle for existence, wars and aggressive intent and natural calamity will lead us to willfully melding with technology to lead towards the singularity. Runway climate change and nuclear fallout may add to this acceleration.

Critics of singularity consider it as speculative, pseudo-scientific and a crackpot theory, and point out that 'accelerating returns' may not attain such heights in such a short time due to the physical limitation of Moore's Law, and inherent issues in mapping the human brain to develop human-like AI. In a future where no singularity takes place, we should still witness the coming of AGI and a robot economy. Only time will tell if our future generations live to tell the story, or whether our extinction is recorded in binary code.

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