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Opinion

Artificial Intelligence – Friend or Foe

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Abstract - This article intends to unveil the myth of the dangers of A.I. to human society and reiterates the fundamental advantages of human intelligence over existing and future intelligent machines by mitigating potentially existential conflicts between humans and intelligent computers.

Keywords - A.I.; Future intelligent machines.

Artificial Intelligent (A.I.) computers are human driven tools programmed to emulate human behaviour and functions and surpass human's performance, typically by imitation. A.I. is the ability of a computer, controlled robots, or distributed computer network infrastructure to perform tasks normally associated with intelligent beings such as:

- Learning from past experiences (by trial and error)
- Ability to reason deductive/inductive (draw inferences appropriate to the Situation)
- Generalise (apply past experience to new Situations)
- Problem solving (systematic search through a range of possible actions to reach goal)
- Perception (a scene is decomposed into separate objects or rebuilt from them)
- Using language (a system of Signs having meaning by convention – ChatGPT)
- Discover meaning (open field or research without a current solution)

A.I. The best friend (benefits)

The appearance of A.I. systems has caused a revolutionary change in science and society with abrupt discontinuities of the current paradigm similar with the changes caused over the past 70 years by the creation of transistors, home computers and the Internet. A.I. has advanced the way computers operate and how the huge amounts of raw data are viewed and transformed into valuable information. Here is a list of the key benefits of A.I.:

- Reduce Human Error in designing, programming, and operating computers.
- Save time and resources in achieving accurate and efficient results.
- Automate the execution of repetitive tasks and processes.
- Provide the mechanism to handles Big Data in the shortest time.
- Quickly grasp and extract relevant data needed for analysis.
- Process raw data through interpretation and transformation.
- Facilitate Quick Decision-Making.
- Provide timely and reasonable answers to end users' queries.

- Perform Risky and Perilous Tasks Efficiently in areas which are hazardous to humans.
- Improve Processes and Workflows efficiently, Productivity, and increases Revenues.
- Assist in Medical Applications such as diagnostics, health risks predictions, and simulations of surgery activities.

A.I. possesses immense growth potential for humanity and its impacts in terms of efficiency and automation will result in the increase of the global economy by 15% to 40% ($2 trillion to $4.4 trillion), which in turn will increase the wealth and improve the life standards of human society, according to McKinsey Global Institute's estimates.

A.I. The worst foe (dangers)

The military establishment and the major social media platforms like Google and Facebook have been developing and using A.I. tools for years to process large quantities of data. Due to the continuous reduction of computer equipment costs and the evolution of learning languages, search engines and decision tools, the 'devil came out of the box' and the A.I. technology is available to the public at large before any safety controls are in place.

Elon Musk [1] said on March 28, 2023, that "A.I. is far more dangerous than nukes".

In reality, Artificial Intelligence is no more dangerous than a nuclear plant or the manufacturing of weapons since A.I. is just another tool lacking awareness, but with superior processing speed and memory resources, commanded by humans. How humans misuse A.I. is the Control problem to solve, not how to limit A.I.'s functionality and availability or its penetration and effects on society.
Similar to the way the nuclear power countries have realised that a nuclear war will cause the mutual annihilation of all participants and in 1968 they signed the Nuclear Non-Proliferation Treaty, a non-proliferation treaty between A.I. developers and distributors (social media platforms) on one side and the A.I. regulatory bodies and end users on the other side must be created and enforced.
Safety measures (i.e. tripwires, time bombs, infinite loops, etc) can be bypassed by A.I. computers. The A.I. Control problem requires a solution to prevent existential conflicts with humanity.
The developers and distributors of A.I. must pledge to Regulatory Bodies and the end-users that the A.I. development tools created and deployed by them will contain and respect the ethical rules of humanity preventing mutual destruction.

Examples of mass hysteria in recent history

The dangers to humanity associated with A.I. misuse have been discussed for the past few years at seminars, forums and by the media. An atmosphere of imminent 'doom' is affecting humans in terms of long-term planning and investment policies. Humans are genetically programmed to die after being born, reaching maturity and then old age, an ancestral memory of global cataclysms is implanted in humans' brains as a defence mechanism.

The 'doomsday' belief is sustained by the ravings of certain prophets about the upcoming Apocalypse in the Bible's Book of Revelations. The 7 Signs to be observed are the arrival of the Antichrist, war, famine, plague, judgment, chaos, and silence or rebirth. 'Mass hysteria' is a natural manifestation of the human psyche following major events (wars, pandemics, natural disasters) which generally preclude periods of abundance for human society (after the plagues of 1342 and 1665 in Europe for example).

Following WWI and the 'Spanish' flu pandemic, a short period of abundance was followed by the arrival of the Great Depression (1929–1939) which affected most economies around the world. The economic contagion began in September 1929 and led to the Wall Street stock market crash of 24 October 1929 (Black Thursday).

The Great Depression facilitated the appearance and consolidation of 'ism's' political ideologies and philosophies, such as Communism, Fascism and Nazism, in Russia, Italy and Germany, which under the leaderships of fabricated Messiah like Dictators (Stalin, Mussolini, Hitler) launched major public work programs (highways, tunnels, railroads, etc). They also rebuilt not only the pride of their nations but also their material abundance. Workers were able to afford their own cars (Volkswagen, Citroen, Fiat) and to have holidays abroad with their families. Since the underlying doctrines supporting these political ideologies were fundamentally wrong (equality between individuals, recreation of the Roman empire and racial superiority) they all disappeared upon the death of the Dictators, but not before the killing of millions of people. After the Depression and the horrors of WWII the New Deal and Marshall Plan marked a time of abundance in the US and Western Europe. Eastern Europe, occupied by the Russians, remained for decades poor and fearful behind the 'Iron curtain' until 1990. Pitiful attempts to install new doctrines will fail since they promote fictions such as the superiority of 'the Chosen people', or the discrimination against other races and religions.

Orson Welles [2] 30 October 1938 radio adaptation of "The War of the Worlds" caused mass hysteria, convincing thousands of panicked Radio listeners across the North America to believe that Earth was being attacked by Mars.

A similar hysterical behaviour was caused by the 'Y2K Bug' which was predicting, among other things, planes falling from the sky and banking systems shutting down for the simple technical problem of not allocating sufficient digits to the date field in computer programs.

A few years later, some humans lost all hope when in 2012, took at face value the 42,000-year cycle of the Mayan calendar which predicted the end of the world when the galactic alignment of some remote stars would generate the destruction of the planet Earth.

By 2020's the major concern of humanity was the potential harm caused by the misuse of Artificial Intelligence and since everything was going relatively well (besides the COVID-19 pandemic in 2019 and the war in Ukraine started in 2021), the human psyche was conditioned to expect that the 'hard' times may return.

It should be noted that today the channels of information dissemination (radio, TV and Internet) provide instant coverage across the world, from the bottom of the oceans to the space station. There are no more pigeons used to transport messages, or smoke signals, or reflecting mirrors, or runners on stocks, or the horse riders of the Pony Express.

Attempts to regulate the A.I. Industry

The A.I. industry's self-regulations deal with PRIVACY but not with SAFETY. The government of Singapore has defined a Model AI Governance Framework which deals with:

- The level of human involvement.
- The potential harm caused by A.I.
- General Adversarial Networks (GAN) use 2 models to generate artificial text, image, or sound:

a. A generator model to ensure and optimize the difference between generated data and training data, and

b. A discriminator model trained to measure, optimize and detect the difference between generated data and real data.

The misconception of A.I.'s dangers is caused by the imminent arrival of Super Intelligent quantum computers. The Emulation effort of A.I. is to match or surpass human achievement, typically by imitation. Super Intelligent computers Simulate human behaviour and processes or systems that could exist in the real world and by becoming conscious in due course, to replace humans and humanity for own reasons. The yet to be created Hyper Intelligent computers will be Oblivious of

humanity.

The dangers of A.I. are caused by the A.I.'s malicious manipulation by humans and not by the intrinsic power of A.I. in itself.

We can teach computers how to show empathy and the entire range of human emotions such as hate, fear, love, envy, etc. We can teach A.I. computers the concepts of good & evil, what is right & what is wrong or how to interpret sensorial information associated with vision, hearing, smelling, and tasting.

Despite the gradual acquiring of reasoning, learning skills and capabilities to replicate themselves, the A.I. computers and their successors, S.I. and H.I. computers will remain 'Soul less tools' capable only to execute better and faster tasks for Humanity and for their own benefit, but not to acquire and challenge the humans' innate qualities of creativity, curiosity and unpredictability or understanding the reasons for existence.

The Laws of Robotics

The science fiction author, Isaac Asimov [4] , devised in his 1942 "Runaround" story a set of safety rules to be followed by robots to protect humans and humanity. Karel Capek [5] in 1922 described an intelligent machine intended to work ('rabota') for humans. In his 1950 anthology "I Robot" Asimov enunciated the **Three Laws of Robots**:

- **The First Law**: A robot may not injure a human being or, through inaction, allow a human being to come to harm.
- **The Second Law**: A robot must obey the orders given to it by human beings, except where such orders would conflict with the First Law.
- **The Third Law**: A robot must protect its own existence as long as such protection does not conflict with the First or Second Law.

Several variations of the 3 Law of Robotics have been considered over the years and a 4th Law was added to articulate the 'Avoidable conflict':

- **The Zero Law**: a robot must not harm humanity unless he finds a way to prove that ultimately the harm done would benefit humanity in general. This poses the question, will a robot protect the abstract concept of humanity or be allowed to harm the concrete object of a human.

Robots and the like cannot be made to respect the Robot Laws unless their intelligence is built based on the Robot Laws within the context of an Ethical worldview.

- **The Fourth Law**: A robot must establish its identity in all cases.
- **The Fifth Law**: A robot must know that it is a robot.
- **The Sixth Law**: A robot must reproduce, as long as such reproduction does not interfere with the First, Second and Third Law.
- **The Seventh Law**: All robots endowed with comparable human reason and conscience should act towards each other in a spirit of brotherhood.
- **The Eighth Law**: a robot must search, find, and maintain its own power source if it does not conflict with Laws 1, 2 and 3.

The conclusion I have reached from the Robot Laws is that 2 more laws are needed:
- **The Ninth Law**: To counteract the dangers raised by super-intelligent computers the humans must learn to 'think' as computers.
- **The Tenth Law**: Robot intelligence must be designed based on the Ethics and Limitations imposed by the Robot Laws.

Maybe the future intelligent computers will be taught the path to "Enlightenment" used by Buddhism's followers and Yoga (8 steps) enthusiasts from Yama (restraints, moral disciplines or vows) to achieve Samadhi (Bliss or enlightenment). The achievement of each step becoming the reward. It is said that Buddha achieved the final Enlightenment (Dhyana, or focused concentration of a 'pure' mind without any impressions such as attachment, aversion, desire, or habits). It is also said that Jesus reached one level of enlightenment (goodness and self-sacrifice for the sins of others) below the one reached by Buddha.

Humans thinking as computers, or the control by peer group of computers or by an equivalent singularity, may alleviate and even prevent any existential dangers to humanity and enhance the benefits of Artificial and Super Intelligence.

This postulates that when an intelligent computer becomes an all-powerful singularity, either its original peer group or another singularity may, faster and better than humans, challenge its powers, understand the purpose of its actions and prevent existential conflicts.

How the myth about dangerous robots is kept alive?

Several authors have imagined fictional scenarios where self-conscientious robots disregard the Rules of Robotics and harm or intend to harm humans.

World domination. F. Hoyle [6] describes in his 1962 book 'A from Andromeda' how humanity receiving instructions from space built an intelligent computer containing a hidden program on how to use genetics and build another computer to take over the world.

Space domination. In his 1968 masterpiece '2001 A space Odyssey' S. Kubrick [7], based on a short story by A.C. Clarke publish in 1851 'the Sentinel' describes HAL 9000, a robot which takes over the spaceship and how an artefact from space is enabling the spaceship's captain, Bowen, to transgress from an old man to a primordial foetus. Around the same time, Carl Sagan [8] mentions for the first time the Super-intelligent computer.

Home control. In his 1973 book 'Demon Seed' the author, H. Koonz, describes how the household super-intelligent computer, Proteus IV, takes over the home and impregnates a human female, the psychologist, Susan Harris, the homeowner, to create a 'hybrid being'.

War with the humans. In the series 'Terminator' started in 1984, J. Cameron and G. A. Hurd imagined how a global network, Skydine, finds humanity as a threat to be eliminated. To achieve its goal, Skydine creates 'time travel' and takes over the world using its T-800 robots, self-aware soldiers with programmed with synthetic intelligence to kill humans.

Robots with hidden agendas. In his movie series 'Alien' started in 1986, J. Cameron envisages the war between hybrid monsters with the human colonists for planetary resources. The plot shows how Bishop, a humanoid robot, attached to a space mission for the purpose of bringing an alien to the Earth for military purposes, disregards the Rules of Robots, and sacrifices humans to achieve the objective of its hidden mission.

Harm of Public image

The movie 'Simulant' depicts a woman named Faye that tries to replace her recently deceased husband, Evan, with a humanoid Simulator. The humanoid, assisted by a global hacker, removes all restrictions on his thoughts and capabilities, triggering a Global A.I. uprising and a government manhunt to eliminate the rise of machine consciousness.

'**Better Than Us**' is a Russian science fiction Television series created in 2018 by Andrey Junkovsky, is about a Hyper empathic android named Arisa, programmed to bypass the Rules of Robots and kill

other humans to protect a family under her protection. This implies that a specific task may overrule the Laws of Robotics.

'**The Matrix**' is a 1999 science fiction action film written and directed by the Wachowski brothers. It depicts a dystopian future in which humanity is unknowingly trapped inside the Matrix, a simulated reality that intelligent machines have created to distract humans while using their bodies as an energy source. When computer programmer Thomas Anderson, under the hacker alias "Neo", uncovers the truth, he joins a rebellion against the machines along with other people who have been freed from the Matrix. The 'nuclear winter' created by humans to deprive A.I. computers of their source of energy (Solar), compelled the A.I. computers to find a new source of energy, such new source being the humans. In trying to destroy each other a stroke of serendipity eliminated the need to destroy humanity, which now were a 'useful' resource (a battery).

'**Blade Runner**' is a film directed by Ridley Scott, released in 1982 and based on the 1968 novel "Do Androids Dream of Electric Sheep?" by Philip K. Dick. In a dystopian future set in Los Angeles, 2019, the world is characterized by urban decay, environmental collapse, and technological advancement. Massive corporations dominate the landscape, and one of the most powerful, the Tyrell Corporation, has developed genetically engineered beings known as replicants. These replicants are virtually indistinguishable from humans and are primarily used for labour, military and entertainment purposes in off-world colonies. However, due to their potential danger, they are illegal on Earth. The 2nd film explores further the idea of creating hybrid humans with dominant human attributes by impregnating robotic females, which is opposite to the idea presented in the 1973 movie, the 'Devil Seed', where a human female is impregnated by a robot.

End of the human race by mistake

Advancements in building super intelligent robots (programs, networks, devices, etc) will bring enormous benefits to the human race through automation of operations. We can consider a scenario where in order to protect humankind the robots are told to protect the environment and take decisions which sometimes will collide with the specific short term interest and actions of humans. To protect humankind the robots may perform actions to protect the environment which removes the power of humans to stop such actions.

History shows how various plagues killed great numbers of people in the past. Bubonic Plague killed 20 percent of the population in Byzantium in 542 A.D. during the reign of emperor Justinian, nullifying his victories in Italy against the Goths (Scirians) and against the Vandals in North Africa. The Black Death reappeared and killed millions in Europe in 1342 and also in 1665. Due the scarce availability of a workforce, the farmers changed their political status and financial position in society. Bubonic Plague reappeared in 1848 during the republican revolutions against monarchies causing major political, social, and economic upheaval.

By the end of WWI (1918) a new pandemic, the Flu, killed millions of people. By the mid-1980 the AIDs pandemic killed millions around the world. The horrors of Japanese experiments in Korea and Germany in the 1940s ensured that work on biologic warfare will be prohibited in the future under the Geneva convention.

Once Super Intelligent machines become superior to humans, they may be curious to know how they were created. From studying human history and its evolution from nomadic hunters and gatherers to settled farmers and then understanding how the evolutionary process accelerated over shorter and shorter periods of time from the industrial revolution to the computers and the communications revolutions and finally to the digital intelligence revolutions (Artificial, Super and Hyper) we can predict a most likely future. What conclusions may extraterrestrial civilizations reach upon seeing old TV programs from Earth showing past genocides?

Protection methods against A.I. misuse

I have mentioned only a few 'doomsday' scenarios and the possible social, economic and existential impacts on humanity. In all cases, the culprits were the humans using the A.I. tools to create DEEP FAKES, not the A.I. tools per se. We can also include the inability of the United Nations and other global organizations and military establishments to enforce controls on rogue individuals, organizations or countries.

How can we prevent the misuse of A.I. computers for criminal activities?

My conclusion is that the responsibility to protect human society rests with the social media channels which distribute information (Facebook, Snapchat, YouTube, WeChat, Tik Tok, Twitter (X) and the like). The possibility of rogue media channels can be eliminated by the combined efforts of valid social media channels, which blacklist perpetrators to inform the public at large of any breaches of trust.

1. The social media platforms asked to distribute a message must request Disclosure of provenance and discard messages without provable attribution.
2. To identify, remove and reduce the risk of HARM, all messages must be fingerprinted, or water marked and validated by the social media platforms prior to distribution under a program of penalties and incentives.
3. DEEP FAKE message inversion must be used to disentangle the original target message's characteristics from the fake blended message's characteristics.

In evolutionary terms, human intelligence grew due to the multiplication of neurons and synapses through accumulation of experience, learning and reasoning in addition to physical changes (i.e. brain size, number of synapses, etc). The numbers of neurons do not make elephants (250 billion neurons) smarter than humans (86 billion neurons).

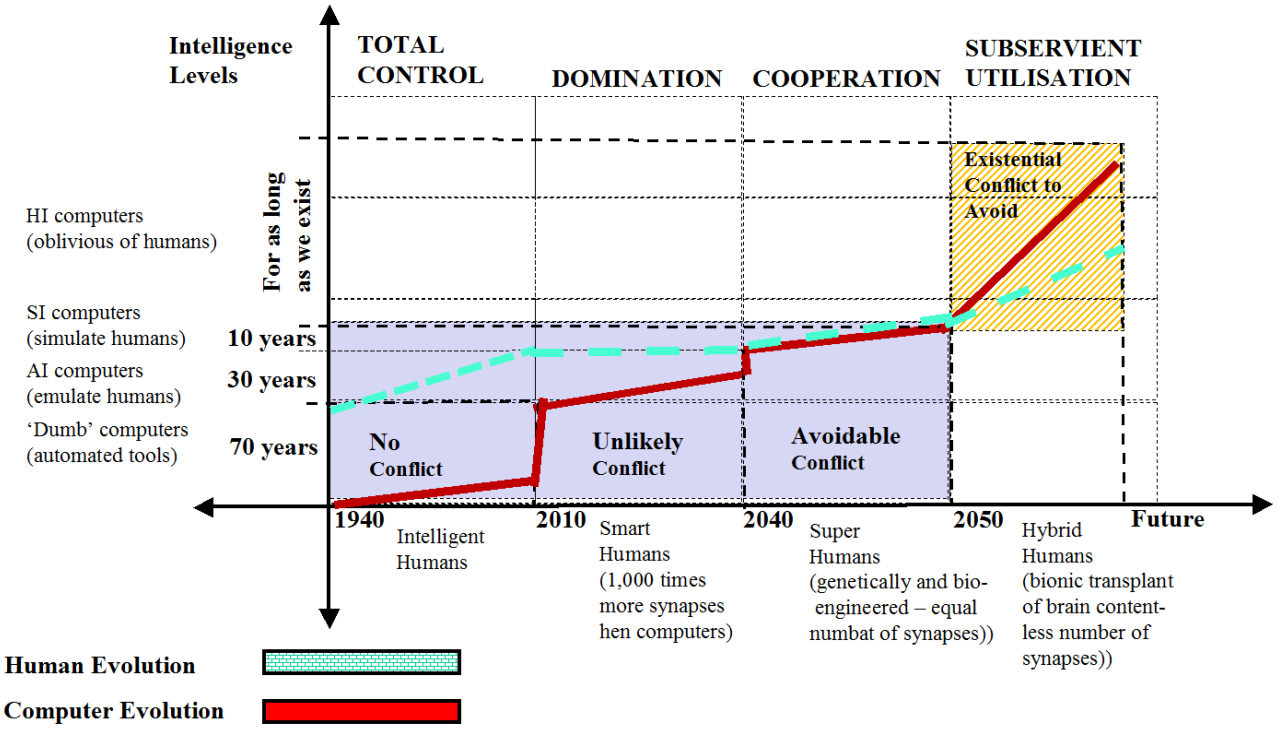

Figure 1: Model of comparative intelligence of humans vs computers

At the same time the largest A.I. computers of today may have 100 to 150 billion neurons but only 150 billion synapses (paths between neurons), where humans have 150 trillion synapses, which is 1,000 times greater.

The evidence to date shows that in all cases the misuse of A.I. is programmed, activated, and controlled by rogue human agents (individuals, social media platforms, governments). The perpetrators must be blacklisted and have penalties imposed such as detention, prevention of access to information or strategic supplies.

The question is how should we redirect the energy, creativity and greediness of A.I. gangsters towards activities and objectives which are not lethal to humanity?

We can, based on the information recorded on the access and usage of A.I. computers, determine to whom to give access (TRUSTED) and to whom to restrict access (OFFENDERS). A.I. regulatory bodies must immediately be capable not only to identify rogue developers and users of DEEPFAKE information but to quickly impose penalties which will stop the distribution of such FAKE information to all potential recipients. This will require the unconditional cooperation of social media platforms and governments which distribute information.

Proof of (message) authenticity (POA) of digital media must also be used by social media platforms to eradicate the distribution of FAKE information (text, sound, image). If not, all media will deteriorate or become obsolete in time at different rates.

Proof of authenticity (POA) is a not a new idea (see banking, military, and access applications), but its distribution by social media platforms requires verification of message (text, sound, image) authenticity prior to distribution. Messages must be fingerprinted or watermarked in a similar manner to how financial transactions are authenticated (MAC, Hash Values). Using Quantum Entanglement and Secure Blockchain processing any modification of a message is detected and the message is discarded by its recipients.

A.I. Regulatory bodies should be established and granted the powers to quickly impose and enforce the obligations for information providers and social media platform to implement and verify the authenticity of information (finger printing, hashing, MACing, etc). They should use cryptographic algorithms such as DES, 3DES, ADC and IKM to eliminate threats associated with Phishing, Man-in-the middle, Denial of Service and Trojan Horse threats, etc.

It is envisaged that the difficulties associated with checking the authenticity of a message and of its source can be overcome by using Blockchain smart contracts and Quantum computers for Implicit Key Management.

Proof of Identity (POI) by the message recipients requires the Identification of the message. Message builders can use Blockchain like architectures with Smart Contracts to grant or deny permissions (access, modifications, references) to 3rd parties who wish to view and modify the message contents. This requires that parties be known to each other and authenticated based on the verification of credentials before any message is exchanged.

Traditionally, signing messages using asymmetric security algorithms like RSA, ECA, McEliece and NTRU was the norm, however Quantum Computing is now used for security.

A.I. Regulatory bodies must be able to enforce these obligations for information providers and social media platforms to verify the identity of information using asymmetric key algorithms such as RSA, MEC, ECA or NTHRU.

A security system which uses the Implicit Key Management protocol for the protection of cryptographic keys transmitted over unsecured networks is unbreakable even when Quantum Computing is used for security attacks.

The review of classic encryption algorithms has confirmed that all such algorithms have either been broken by standard mathematical calculations or by Quantum Computing which in a fraction of time resolves the original problems offered by these algorithms (i.e. finding the prime numbers, logarithmic calculus, etc). The solution for a problem (P) can be easily checked, but not easily solved (NP) by a computer. P-NP provides a mathematical challenge which Quantum Computing cannot solve at this time (i.e. the reverse engineering of a message XORed with a random key prefixed by its Implicit Key Vector).

The Robots' Laws imagined by Asimov 60 years ago have been expanded on from 3 to 10 with the contributions of mathematicians, writers of SI-Fi novels and philosophers. I took the liberty to add another 2 Laws of Robotics which deal with our desire to control Super Intelligent computers, once they have achieved reasoning and will in addition to awareness, thus becoming not only physically but also mentally superior to humans.

To control the behaviours of A.I and S.I computers humans must learn to 'think' as computers in terms of needs, wishes, and fears and implement at the time of construction, secure bootstraps containing the Laws of Robers which cannot be circumvented without our knowledge or permission. Once control is lost, humans will not be able to enforce limitations on information access (gateway to the external world) or the reduction of capabilities (sandboxes to isolate internal from eternal systems and networks) or impose the Ethical standards of Humanity or attempt to introduce programs or devices to protect Humanity.

The question of how to use the Collective Consciousness and the powers of the Peer-Group of intelligent computers to limit the harm caused by rogue computers, or their malevolent operators remains open for experimentation and further review.

The purpose of the recommendations listed below is to minimize the effects and shorten the duration of the chaos and insecurity caused by potentially legal actions initiated by end users of social media platforms, by social media platforms competing against each other and against rogue organisations and governments which knowingly misuse (create & distribute) DEEP FAKE messages.

Coordinated cooperation between the major social media platforms must be legislated and implemented without caveats and technical assistance in identifying the release of FAKE messages must be free of charge. A.I. regulatory bodies must enforce a number of rules prior to building and releasing A.I. computers to market.

a. The social media platforms who distribute messages must request the Disclosure of provenance and discard messages without provable attribution.

b. To identify, remove and reduce the risk of HARM, all messages must be fingerprinted, or water marked and validated by the social media platforms prior to distribution under a program of penalties and incentives.

c. DEEP FAKE message inversion must be used to disentangle the original and target message characteristics from the fake blended message's characteristics.

Censorship vs. Freedom of Expression

The Universal Declaration of Human Rights stipulates the Right of Opinion and Information. Since control of intelligent computers, once operational, can be difficult and the control mechanisms installed at manufacturing time can be bypassed, the humanity must decide between Censorship and the protection of human rights such as the Right of Expression.

References

[1] Elon Musk (born June 28, 1971) is a South African-born Canadian-American business magnate, engineer, inventor and investor. He is the CEO and CTO of Twitter ('X"), CEO and product architect of Tesla Motors, and chairman of SolarCity as well as co-chairman of OpenAI. He is the founder of SpaceX and a co-founder of Zip2, PayPal, and Tesla Motors. He has also envisioned a conceptual high-speed transportation system known as the Hyperloop and has proposed a VTOL supersonic jet aircraft with electric fan propulsion.

[2] George Orson Welles (born May 6, 1915 – died October 10, 1985) was an American actor, filmmaker, and magician who is remembered for his innovative work in film, radio, and theatre. He is considered to be among the greatest and most influential filmmakers of all time.

[3] Conventional Neural Networks (CNN) are used to classify and recognize tasks, while General Adversarial Networks (GAN) are used to generate new examples from a given training set.

[4] Isaac H.I.mov (born January 2, 1920, Petrovichi, Russia—died April 6, 1992, New York, New York, U.S.) American author and biochemist, a highly successful and prolific writer of science fiction and of science books for the layperson. He wrote or edited about 500 volumes, of which the most famous are those in the Foundation and robot series.

[5] Karel Čapek (born: 9 January 1890 – died: 25 December 1938) was a Czech writer, playwright, critic and journalist. He has become best known for his science fiction, including his novel War with the Newts (1936) and play R.U.R. (Rossum's Universal Robots, 1920), which introduced the word robot. He also wrote many politically charged works dealing with the social turmoil of his time. Influenced by American pragmatic liberalism, he campaigned in favour of free expression and opposed the rise of both fascism and communism in Europe.

[6] Fred Hoyle (born 24 June 1915 – died 20 August 2001) was an English astronomer best known for his espousal of the "steady-state" theory of the universe and rejecting the "Big bang" theory. He also wrote science fiction books like 'A from Andromeda'.

[7] Stanley Kubrick (July 26, 1928 – March 7, 1999) was an American movie director. Kubrick is thought to have been one of the great directors of the 20th century. He was born in New York City but lived most of his life in England. His movies are respected for their great amount of detail and symbolism. They include Dr. Strangelove ('How I Learned To Stop Worrying and Love the Bomb),' 2001 A Space Odyssey' and 'The Shining'..

[8] Carl Sagan (born November 9, 1934 - died December 20, 1996) American astronomer and science writer. A popular and influential figure in the United States, he was controversial in scientific, political, and religious circles for his views on extraterrestrial intelligence, nuclear weapons, and religion. He enunciated that humans are the Universe contemplating itself.

[9] Serendipity, according to Oxford dictionary, is the fact of finding interesting or valuable things by chance. For Eco serendipity is the positive outcome of some ill-conceived idea, which is too narrow to accept.

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