

## ON THE WAY TO SUPER INTELLIGENCE: “THE LAST INVENTION THAT HUMAN NEED EVER MAKE”

Kiran Sharma<sup>1</sup>, Simarpreet Kaur<sup>2</sup>, Mansi Rana<sup>3</sup>

Lecturer, Lovely Professional University, Phagwara

### Abstract

*This paper outlines the Ultra Intelligence Explosion. The speed of light or the mass of the electron is eternally constant but the power of the human brain is learning considerably. Enhancements can be made to brains in terms of knowledge, adaptability, learning and intelligence explosion. In contrast to the biological nervous systems machines can process information efficiently and effectively. The human species work hard to become smarter and wiser. Whilst human prepare intelligent machines which are smarter than human brain. In comparison to the biological counterpart the artificially designed neurons can operate million time faster because of their faster processing speed and huge storage capacity. By introducing all these advancements one day human may be able to produce “super intelligent machines” which could recursively create more ultra-intelligent machines. If human will introduce such intelligence in the machines then, Will the intelligence gained by the machines lead towards the beneficial behavior against human when moral values are not introduced. This in result will surely lead to the ending of human era within next 30-40 years. The best arising issue “Whether this progress is beneficial for humanity?” is probably “Yes, but not briefly true.” The survival of human species is extremely threatened by the advancements in Super intelligence. Meanwhile, there are number of unavoidable reasons which are inter linked with the technological intelligence advancements and cannot be neglected such as economic payoffs, benefits produced by the machines, medical drugs, entertainment, elimination of endanger to human life where main motive is military protection.*

### Keywords

Technological Singularity, Intelligence, Life, Super Intelligence, Explosion, Artificial Intelligence.

### 1. Introduction:

In the age of the computer, the great scientist Alan Turing (1950) realized that in the coming years machines are going to be more capable in genuine thoughts.

*“I admit that at the end of this era... one will be able to speak of machines thinking without awaiting to be contradicted.”*

Shortly after computers were invented, people wanted to teach them to think. People naturally wanted to turn them into intellectual assistants and partners of people. This is how the problem of artificial intelligence arose. Due to the work of many prominent scientists and engineers people realized the need of using them to solve more intellectual tasks than mathematical calculations. The first goal that was set was to teach computers what humans learn in beginning of their life; to speak and understand human speech, to recognize people, to identify the things and animals around them, to maintain equilibrium and to walk, as people believed that these were the simplest intellectual tasks. Later on it was expected to teach computers to solve the most complicated problems, these are called intellectually demanding tasks. These tasks made up the subject of investigation of the so called artificial intelligence. To talk about an intelligence explosion one has to know what one means by “intelligence” as well as by “explosion”. However, since “intelligence explosion” is a qualitative concept, we believe the commonsense and qualitative understanding of intelligence suffices. The human skills are getting transcended by computers in many a ways in every coming year.

•The principle of principia mathematica which was proved by Russell and whitehead was

improved by a computer program written in 1956. The results of the program were more full proof than the solution developed by the scientists.

- The tasks that required human skills were exceeded by Expert Systems in the 90's.
- The human ability in chess was stood out by Deep Blue Computer of IBM in 1997.
- The best of best human players in Jeopardy game were beaten out by IBM's Watson computer in 2011.
- In a recent study, the scientific knowledge about yeast was programmed by Adam (a robot). It exhibited its hypothesis, examined them, and evaluated the results. Adam helped to answer a question about yeast that had stumped human scientists for more than 150 years.

## 2. Intelligence:

Human is the most intelligent creature. Human's has the ability to learn, to transform and produce technology. Intelligence cannot be treated as individual activity. Individuals are different from one another in the ability to understand the problems and to adapt to them. The thinking and dealing of the individual can act purposefully and rationally and effectively with the problems in the environment. Such individuals possess intelligence.

Intelligence is the volume of knowledge which is stored somewhere in our mind and recalled when required from the individual's brain. One can create knowledge and although it can be shared with the society also. Here the problem arises is acceptability; individual develops knowledge and shares it with society but society does not accept it. Similarly we have another trait called geniuses. It is our ability to create knowledge, solve problems and to innovate intellectually but not intelligence. Problem solving is a form of knowledge creation that works by the similar process as innovation and creativity.

Activities involved in the Intelligence:

1. Self-preservation
2. Self-replication
3. Spreading
4. Creating faster, better intelligence
5. Understanding

6. Self sufficiency
7. Learning
8. Transformation of matter

### 2.1 Is Intelligence restricted or unrestricted?

Another important aspect of intelligence is how flexible or adaptive an individual is. Deep blue might be the best chess player on Earth, but is unable to do anything else. On the contrary, higher animals and humans have remarkably broad capacities and can perform well in a wide range of environments.

Such as humans are not faster but more intelligent than dogs. Dogs in turn are more intelligent than worms and not just faster. Even if we cannot pinpoint exactly why human are more intelligent it is the capacity within the human to produce technology or to transform the environment.

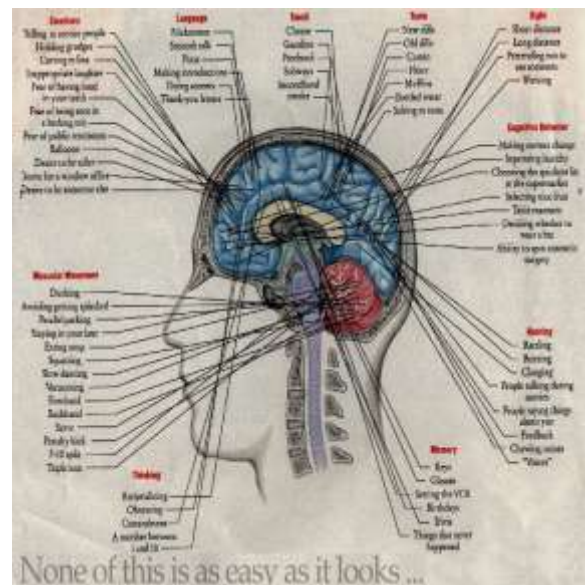


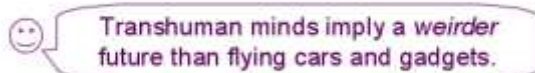
Fig 1: Various traits of human intelligence

### 3. Super Intelligence

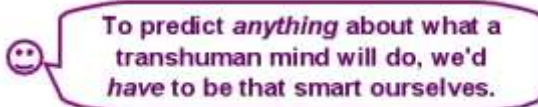
In every field of "super intelligence" the machines which are designed have the intellect much smarter and sharper than human brains. It includes public wisdom, social skills and scientific creativity. Once artificial intelligence hits the human level, there will be a constructive feedback knit that will give the development a farther elevation. AI is the one of things that will help in delineating better AI's, which in turn would help fabricating better AI's, and so forth.

Although they are capable of accomplishing numerous tasks which distinct human might not be able to complete. The machine intelligence is developed so much that even if no further developments took place and new skills are not acquired by the machines. Even then also machines with the help of self-learning will be able to attain new skills. The Artificial Intelligence would get smarter if speed of processor will continue to increase. If after every 18 months the hardware is going to increase or double the processing speed then machines having super intelligence that will be able to work binate as fast as its pioneer implementation. After slight dueling of the technology this super intelligence will develop such intellect that it will match with the abilities of human brain but it will be much faster.

As we know human being has the ability to inherit the traits from its ancestors. In the same way it is possible to copy skills or modules from one artificially designed machine to another machine. Meanwhile, it might be possible that a best machine will be designed after combining the prime parts of several AIs.



Transhuman minds imply a *weirder* future than flying cars and gadgets.



To predict *anything* about what a transhuman mind will do, we'd have to be that smart ourselves.

### 3.1 The demand for super Intelligence

With the advancements in the technology computer industry is investing huge sum of money in the development of hardware and software. This development will continue until it is generating profits. So, the demand is for better software and hardware. Due to which day by day super intelligence is becoming technologically feasible. There is a huge list of benefits associated with it because of which people are adapting to the technology. Such benefits include medical drugs, elimination of human power from the dangerous jobs,

entertainment and military motive to save human lives. In spite of all these advancements these machines lack in the intellects and innovative minds. There are many areas in which these machines are lacking behind netted as real-time communication with the scientific community.

### 4. Intelligence Explosion

I.J. Good, The eminent mathematician had invented an idea of “intelligence explosion” in 1965. The core idea was to develop an interface between brain and computer which may increase the human intelligence. With this improved intelligence what extra traits will be developed by the human? Instead of using it for the personal improvements, will it be used to develop better artificially designed brain computers?

All the inventions in the human technology are happening due to the advancements in the Artificial Intelligence which was possible only due to the human intelligence. All such advancements and changes are leading us towards smarter machines and interfaces designed by following the techniques used by brain. One day this changing environment will create a knit of advancements in the technology and a cycle is created which as a result will give birth to the even better computers depicting like human brain. The most prominent example of creating such loop is improvements in artificial intelligence which consistently improves technology by rewriting the source code.

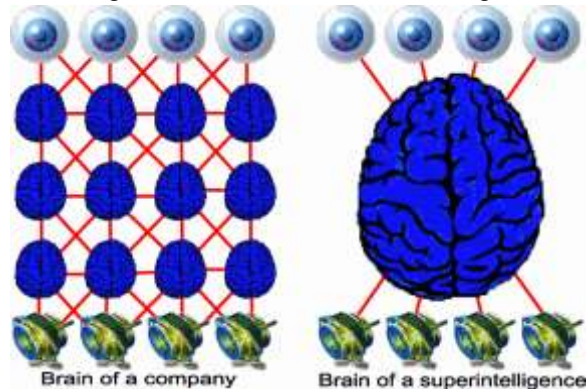
The repetitive improvement in itself is specified as “intelligence explosion” which was quoted by I.J. Good.

A recursively self-amending Artificial Intelligence is what I. J. Good initially assorted as an “intelligence explosion”.

This self-amendment and recursion will create interfaces which are interactive and they augment like human even while performing on Artificial Intelligence activities.

As a species the main source of our power generation is intelligence. Neuro-technology is one of the future technologies which have impact on our mind. Brain- computing interfacing and Artificial Intelligence are the other concepts which are directly or indirectly related to Human

Intelligence. With the implementation of all these technologies smarter machines are designed.



The brain and the computer are the two main parts of the system. The core of the computer system has a speed of computing more than hundred operations at every fraction of second. Systems can be built with higher neural bandwidth which will meliorate the computation speed of system. This will bring amendment to the system but to an extent. The further development will be ceased while designing the primary part of the computer system which depicts the copy of brain. The evolution bought in the technology will not add features in the machines to hack human brain. Even if, the hardware is embedded with the latest technologies which could help to read the individual neuron and even allow modifying it. Moreover, to add new neurons, increase processing speed of neurons. But, still we will be unable to match the techniques used by human brain which is an immense disarray of undocumented spaghetti code which cannot be modified by end-user. Intelligence Explosion could come through the self-amendments in the system to make it smarter day by day. This mechanism may take years or hours for improvement.

### **Smarter versus Faster**

There are number of reasons which affect the process of speedup of intelligence. The one factor among it is faster operation of a system which is increased proportionally to the clock speed. The factor of improvement is the mechanism to implement thought process. The both factors are important. To an extent it is easy to achieve the first mechanism but the

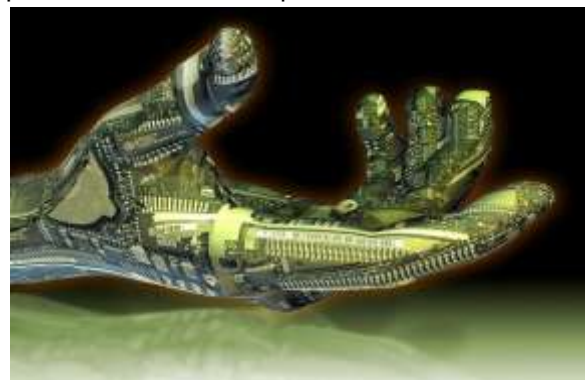
second one is difficult to achieve because it also have some limitations to the implementation.

Speeding up the hardware is in progress from longer times and is going on. These two factors and routes lead towards the “super intelligence “ because if machines have acquired the human level thinking and become more creative by self-improvement then the same traits of human will be performed in a better way by the machines due to the processing occurring a thousand times faster than it does.

According to the given laws of physics, a device can be designed for computing purpose. Such devices can execute instructions million times faster unlike human brain.

The motor outputs and sensory inputs can be speeded up. These sensors operate on the timescale of nanoseconds which increases its speed to million folds.

This scenario will make it possible to design a brain which works faster than human brain. To implement the technology Moore’s law worked which stated that “the transistors integrated within the circuit will double in every 2 years. Due to the advancements in the integration technology these computing devices perform million times faster as fast as the human brain. The Nano devices are used to build this technology which implements Nano machine. This gives us the nanotechnology which tends to increase the speed to million folds. As a result it will develop an ultrafast mind having the molecular nanotechnology which has immense power to transform the planet.



The smarter and faster machines than human intelligence develops self-improving machines. The machines which have access to their programmed code referred as source code

become able to reshape their own mind. So, they develop smarter machines having brains which improve themselves and generate faster results than human intelligence. Having access to its own built-in programming code brings smartness to the artificially designed machines. Human is able to optimize the code, they can enhance their smartness by learning the way of optimizing their work for generating faster results but it is not possible to change the way how our brain works. Meanwhile, if machines are able to improve it than it can plausibly make it faster also. If the computing speed will be increased this will speed up whole brain and make it smarter and faster than human intelligence. While speeding up a mind does not make a machine smarter but it will add more processing power to the various processes it executes. The main idea is the birth of machines which are smarter and faster than human intelligence. When all the features are combined together cited as smartness, faster processing speed and self-improvement of source code will result in an event that is so huge that there are no comparison left.

**The explosion could result in destruction of everything:**

In the forthcoming era, policy –makers can be certain that AI's would not threaten human interests, thus the progress of artificial intelligence will go forward. But if they can't be certain about the threat, then the progress might go forward without any hindrance. Because people do not consider the considerable displacement of humans with artificially designed machines as essentially a dreadful outcome or we can consider that when such strengthened forces will activate then such an accumulative decision cannot be taken to prohibit new research in this field and progress in these machines will occur successfully infinitely.

If there exist the smarter intelligence than the human, then that mind can easily reproduce even smarter minds. In such a way this this dynamicity can explore the small causes that could have large effects. All this forms a unique technology like Artificial Intelligence, computer-brain interfaces, or might be something

unforeseen – that lead towards the development of smarter brains. This technological advancement is proportionate to the first self-simulate chemical that accelerates the life on Earth. Literally so, over and over again, intelligence has achieved the mechanism that once sounded ridiculous.

Similarly, if intelligence is improved by technology then invention of the powerful cognitive technologies becomes easier and again the process advances the human priority of the Intelligence explosion.

Joy and sorrows are the two sides of a coin. In this technological advancement mournful endings are fortuitous, but not inevitable. Destructive minds and their intentions want to destroy the world, want to create hell on the earth, but creative mind and their intentions will preserve the actual/original motive behind the development of the technology. So, we have included the term "Friendly AI" for this whole challenge, the creation of a mind that will not harm the humanity but does beneficial for humanity like curing cancer.

If we get success then heaven would be on this earth. Intelligence explosion is emerging as a super power and that power can make the things admirable as well as disgusting. There exist some problems that are too awful and they need to be solved as quickly as possible as this planet has lot of space for improvement.

**Conclusion:**

Intelligence is a trait of human being which has revolutionized the inventions. Human Intelligence extends his dominance on the planet in every blink of eye and the inventions are occurring on evolutionary time scales. All the developments and technological inventions were and are possible only to the extreme intelligence human have. Intelligence helped to abolish diseases and it gives strength to develop safeguards against the nuclear war.

In the initial stage of developments, the traits of human being are scanned into computers neuron by neuron. This scanning and up-gradation goes on until the machines do not become super smart. This up-gradation has given emergence to the challenges of super intelligence. Along with this the other challenges

also emerged. Some of them are designing of smarter machines than human intelligence. There was a subsets of requirements related to technology and knowledge which has updated the machines.

With various strict subsets of the technology and knowledge required to upload and upgrade machines, one could:

- Upgrade artificial brains in-place (for example, by adding new neurons which will be usefully wired in)
- Designing an interface for computers to acquire traits from biological human brains;
- Introduce Artificial Intelligence.

The consequences of an intelligence explosion would be enormous, because intelligence is powerful. A machine that surpassed us in all these domains could significantly reshape our world, for good or bad. Thus, intelligence explosion scenarios demand our attention. One day a machine will blink into consciousness, but it's just wishful thinking to believe that people could escape death by uploading their minds.

#### References:

1. AMERICAN JOURNAL OF SCIENTIFIC AND INDUSTRIAL RESEARCH :© 2010, Science Huß, <http://www.scihub.org/AJSIR> ISSN: 2153-649X doi:10.5251/ajsir.2010.1.2.96.104
2. **Human-computer super-intelligence :Alexander A. Antonov**
3. Machine Super Intelligence: Doctoral Dissertation submitted to the Faculty of Informatics of the University of Lugano.
4. Superintelligence Does Not Imply Benevolence: Joshua Fox, Carl Shulman; Singularity Institute Research Associates
5. Legg, Shane. 2008. Machine super intelligence. PhD diss., University of Lugano. [http://www.vetta.org/documents/Machine\\_Super\\_Intelligence.pdf](http://www.vetta.org/documents/Machine_Super_Intelligence.pdf).
6. Yudkowsky, Eliezer. 2008. Artificial intelligence as a positive and negative factor in global risk. In *Global catastrophic risks*, ed. Nick Bostrom and Milan M. Cirkovic, 308–345. New York: Oxford University.
7. Anderson, Michael, and Susan Leigh Anderson. 2007a. The status of machine ethics: A report from the AAI symposium. *Minds and Machines* 17 (1): 1–10. doi:10.1007/s11023-007-9053-7.
8. Edmonds, B. (2006). The social embedding of intelligence – Towards producing a machine that could pass the turing test. In *The turing test sourcebook: Philosophical and methodological issues in the quest for the thinking computer*.
9. Kurzweil, R. 2005. *The Singularity is Near*.
10. Legg, S. 2008. *Machine Superintelligence*.
11. Flynn, J.R. 2007. *What is Intelligence?* Cambridge University Press.
12. Bostrom, N. 1998. How long before superintelligence? *International Journal of Future Studies* 2.
13. Lucas, J.R. 1961. *Minds, machines, and Godel*. *Philosophy* 36:112-27.
14. Vinge, V. (1993). *The coming technological singularity: How to survive in the post-human era*. VISION-21 Symposium. NASA Lewis Research Center and the Ohio Aerospace Institute.
15. *Can Intelligence Explode?* Marcus Hutter: Research School of Computer Science ; Australian National University & Department of Computer Science; ETH Zurich, Switzerland.
16. Yudkowsky, E. 2007. Three major singularity schools. [<http://yudkowsky.net/singularity/schools>]
17. Moravec, H. (1998). When will computer hardware match the human brain? *Journal of Evolution and Technology*,
18. Eisenk, H. Yu. (1995). The concept and definition of intelligence. *Problems of psychology*,
19. Good I.J. (1965). *Speculations Concerning the First Ultraintelligent Machine*. *Advances in Computers*
20. Goertzel, B.&Pennachin, C. (2007). *Artificial General Intelligence (Cognitive Technologies)*. NY: SpringerVerlag.
21. Kurzweil, R. (2005). *The Singularity Is Near: When Humans Transcend Biology*. NY: Viking.
22. Yudkowsky, E.S. (2006). *Artificial Intelligence as a Positive and Negative Factor in Global Risk*. Palo Alta, CA: Singularity Institute for Artificial Intelligence
23. Omohundro, Stephen M. 2007. The nature of self-improving artificial intelligence. Paper presented at Singularity Summit 2007, San Francisco, CA, Sept. 8–9. <http://singinst.org/summit2007/overview/abstracts/#omohundro>.
24. Guarini, Marcello. 2005. Particularism and generalism: How AI can help us to better understand moral cognition. In *Machine ethics: Papers from the 2005 AAI fall symposium*, ed. Michael Anderson, Susan Leigh Anderson, and Chris Armen, 52–61. Technical Report, FS-05-06. AAI Press, Menlo Park, CA. <http://www.aaai.org/Papers/Symposia/Fall/2005/FS-05-06/FS05-06-008.pdf>.
25. <http://www.rohan.sdsu.edu/faculty/vinge/misc/singularity.html>
26. Bostrom Nick (2006). "How long before superintelligence?". *Linguistic and Philosophical Investigations* 5 (1): 11–30.