Open Access Library Journal
2017, Volume 4, e3995
ISSN Online: 2333-9721
ISSN Print: 2333-9705

On Opening the Gate to the Stars and Superintelligence

Luis F. Copertari

Computer Engineering Program, Autonomous University of Zacatecas (UAZ), Zacatecas, México
Email: copertari@yahoo.com

How to cite this paper: Copertari, L.F. (2017) On Opening the Gate to the Stars and Superintelligence. *Open Access Library Journal*, **4**: e3995.
https://doi.org/10.4236/oalib.1103995

Received: September 30, 2017
Accepted: November 14, 2017
Published: November 17, 2017

Abstract

Humanity is engaged in a search for the future, a search both inwards into the meaning and basis of our own humanity and the possibility of superintelligence (being that biologically based, artificial or both) and outwards out to the stars and the exploration and colonization of other planets. I call the emergence of superintelligence transcendence and the discovery of space jumping, which would make human colonization possible through interstellar travelling, the singularity event. I believe we need both of these events if we truly want to succeed and survive as a species towards the foreseeable future.

Subject Areas

Anthropology, Information Science

Keywords

Superintelligence, Space Jumping, Interstellar, Colonization

1. Introduction

According to Raymond Kurzweil [1], the singularity will occur in the late 2030s or 2040s, when the computational power of technology becomes greater than the computational power of all of the brains in the history of humanity. At that time people will be able to live in virtual worlds connected to their biological senses seamlessly, make digital copies of themselves, and begin a path towards exponential technological growth, replacing and/or enhancing our biology. I do have many arguments against the actual occurrence of Kurzweil ideas by the time he predicts. In any case, I prefer to call this event transcendence, not singularity, like in the movie by the same title, in which Will Casper (Johnny Depp) goes beyond his humanity (Depp [2]). Margaret Boden [3] gives a much more ba-

lanced and reasonable account for the present, nature and future of Artificial Intelligence (AI).

Harari [4] considers three alternative paths to human development: 1) the biological and genetic engineering improvement of human beings, where people are no longer subject to the rules of evolution but rather select which genomes strive based on design, 2) the development of strong artificial intelligence, where machines or even superhuman machines develop consciousness and self-awareness, and 3) cyborgs, where the biological combines with the artificial allowing humanity to evolve and achieve superhuman powers.

The movie "Blade Runner" (Ford [5]) provides the point of view of the biological/genetical superhuman improvement scenario, where "robots" are made of biologically engineered organs, built to serve human colonization efforts and for pleasure. The movie "In Time" (Seyfried & Timberlake [6]) considers the possibility of a new race of people where everybody is genetically engineered to live forever as long as they are able to buy living time. Both of these pictures consider the biological/genetics path to human improvement.

The movie "Ex Machina" (Gleeson, Vikander & Isaac [7]) considers the point of view of purely artificial creations, where a tech guru invents a way to create AI that clearly passes the Turing test. The idea of using cyberspace itself in order to model AI is not such a bad idea.

Finally, most science fiction movies incorporate concepts that merge both the biological and the artificial, thus articulating the Cyborg point of view. The movie "Ghost in the Shell" (Johansson [8]) is a very thought provoking and shocking recent example of such kinds of ideas.

I believe the term singularity should be reserved for something much more transcendental than technology going beyond biology or biology creating superhuman characteristics. To me the singularity will occur, sooner or later, when humanity learns to travel from one point of space to another point of space instantaneously (hence only space becomes important, not time). There is nothing inherently contradictory to traveling instantaneously from one place to another, although it must not be possible to travel backwards in time.

Observing the sky is like observing a time machine, because when we see the night sky, we are seeing light coming from the Moon, solar planets or other stars and galaxies as it was when the light started departing them traveling towards us. Thus, when we see the Moon, which is approximately one light-second away from us[1], we see as it was one second ago. When we see the Sun, we see it as it was approximately eight minutes ago. The closest star, Proxima Centauri, is approximately 4.3 light years away (Sagan [9]). Thus, if it were possible to space jump to Proxima Centauri, the traveler would arrive to Proxima Centauri and see it as it is now, not as it was 4.3 years ago. If it sends an electromagnetic message back to Earth, it would take 4.3 years for the message to arrive. Further-

[1]To measure large distances, the time it takes light to travel those distances is used. Thus, one light second is approximately 300,000 kilometers, one light minute is sixty times that distance, and one light year is the distance light travels in one year.

more, Proxima Centauri would be in a different position than it is as observed from Earth before departing. It would have moved from where it was seen before departing the Solar System. That makes space jumping even more challenging, because one needs to consider the position celestial objects will have when arriving by entering the traveling coordinates at departure time.

Space jumping will require accomplishing the "holy grail" of Physics, a comprehensive theory of everything or theory of unification, because it should merge into one single theoretical construct all four forces of nature: gravity, electromagnetic force, weak nuclear force and strong nuclear force. More specifically, merging gravity and electromagnetic force with the constructs of quantum mechanics. I call such event the space jumping singularity. This paper is not about achieving such theory, but rather on some guidelines and implications for such groundbreaking feat.

Approximately every 100 million years, on average, an asteroid hits Earth (Sagan [9] [10]). In any case, our planet is quite vulnerable and needs a delicate balance to maintain the conditions required for human life. Thus, it would be a great idea for humanity to colonize at least another planet in order to ensure the survival of the human species or whatever else humanity becomes in time.

2. Artificial Intelligence: A New Form of Slavery?

Clearly, interstellar space colonization will require huge effort and infrastructure, not only financial, but also technological and human. The force driving the development of the new American continent after the European colonization was slavery of black people. Although the people that could reach out and colonize new stellar systems would go to stay definitively on those planets and never to return to Earth (generally speaking), they will have to generate all the goods and commodities they will require by using (mostly) the resources of the exoplanet to be colonized. Although it is quite likely they will find huge wealth in the form of new life and even entirely new ecological systems, the colonists will have to build the basis of their own sustenance. The workforce of the human colonists is not going to be enough. And given the fact that human slavery has been abolished (at least in principle), a new form of slavery will be imposed and generalized: machine slavery. But, can a machine with Artificial Intelligence (AI) be considered alive and having free will? Copertari [11] holds that in order for AI to be considered having free will and consequently deserving the basic rights and obligations of every human being, the existence of such free will must be proven, which is extremely difficult to do. Even assuming AI develops incredibly during this new millennium, where exactly do we draw the line between alive and dead, free and slave? Certainly, it would be very difficult for AI machines to prove they are alive and having free will, which creates the opportunity for a slavery of such machines that could last centuries.

Kurzweil [12] describes how it should be possible to eventually create AI that is conscious of itself. However, should these machines have the same rights and

obligations of a human being? In the end, human rights are precisely referred to that, human beings. There is no such thing as cybernetic rights. But, should there be? It is possible that in the end artificial machines and biological human beings will be indistinguishable. Even transferring a biological consciousness into an artificial one could be considered as a way to transcend our mortal condition (Kurzweil [1]).

Zinn [13] in his book talks about the terrible slavery suffered by black people and how they were denied the right to be human and to proudly hold their existence as equal to white people. It also talks about the slaughter against the indigenous population of the new continent (America).

Concerning the latter, it is fitting to say it is not a good idea to colonize a planet possessing a developed civilization for two reasons: first, there is the huge risk of finding a civilization technologically more advanced than ourselves that could end up invading Earth. Second, there is the problem of facing not only the basic trouble of subsisting in a new environment, but also the additional difficulty of having to deal with a civilization, presumably inferior, when history proves it is not possible to reach such conclusion. No civilization, no matter how technologically simple, can be considered to be inferior to another.

Thus, the hardest part of the colonization of habitable exoplanets in other star systems will be placed upon the work of machines, those being purely mechanical (traditional or weak AI) or so advanced that they could be indistinguishable from human consciousness. Even then, it will cost cybernetic entities (and maybe even droids of artificial origins as to the essence of their mind) a huge effort, struggle and time until they reach a point in which they can be considered to be equal to human beings in rights and obligations.

As history clearly demonstrates, the work of black slaves during slavery times in America was decisive and necessary in order to allow the successful settlement of the new European colonists (Zinn [13]). It was only until the American civil war, when the work done by machines (non intelligent) released manual human labor, that the progressive states of the American northeast (Yankees) defeated the slavers confederate states of the sourth, thanks precisely, to a great extent, to the use of the more advanced war machinery the Yankees had and also in part thanks to the collaboration of black people released from slavery.

As a consequence, the conclusion is clear. Even if it can be placed in doubt the real existence of consciousness and even spirit in machines, AI will be the ideal candidate to bear the weight of the construction of new colonies in other star systems, following a new form of slavery: cybernetic slavery.

Cybernetic slavery in the case of insterstellar colonization is not a luxury, it will be a need. Work requirements are not only manual but also intellectual, and the challenges posed by the colonization process are huge. Only human beings working side by side with the most advanced AI will be capable of succeeding. Besides, in order for people to be willing to leave everything they know for an uncertain future in new star systems, a great incentive will have to be offered. In

this case, such incentive is the possibility of becoming lords and masters of vast territories in the newly colonized exoplanets. Then, it would be expected that human beings enjoy their rights and freedoms while enslaved machines will bear the biggest part of the work to be carried out. Certainly, the best intention would be to build weak AI, so that it is not conscious of itself nor having free will, no matter how perfected they are. Each machine would be specialized in doing one or just a few jobs very well.

Although some authors are very conservative with respect to the future of AI (Boden [3]; Searle [14] [15]), others are more optimistic (Turing [16] [17]; Minsky [18]; Moravec [19]; Franklin [20]). Personally, I think that the human cybernetic transcendence will be unavoidable (Copertari [11]).

3. Global Corporations and the Interstellar Corporation

Marx [21] in his three books does a very rigorous critique to traditional capitalism, that is still the fundamental basis for today global corporations. There are several indicators that seem to point to an exhaustion of the traditional capitalistic model. More specifically, the limitation imposed by the natural resources that exist on Earth and new social pressures, today of a global characteristic, that exist throughout the cradle of human civilization. Harvey groups all these and discusses seventeen contradictions currently putting pressure on the global corporation (Harvey [22]).

Planet Earth is the cradle of human civilization, but it is not expected for humanity to remain in the cradle forever, understanding humanity not only as it exists today, but also as it could exist in the future, as superhuman hybrid entities, peharps even of planetary size and, eventually, reaching a whole star system.

There are several authors critizicing the current functioning of moneraty systems and they bet for new (although complementary) forms of exchange (Greco [23]; Hallsmith & Lietaer [24]; Lietaer & Hallsmith [25]; Lietaer & Dunne [26]). However, all exchange requires not only information transfer, but also material transfer. Consequently, how could interstellar commerce develop? Simply by the exchange of goods and services. In principle, there is no interstellar currency in sight. Nevertheless, the work of the previous mentioned authors on complementary currencies and alternative financial systems clearly shows that value exchange could simply be given as an exchange in the personal/corporate balance each individual/company has at his/her/its disposal at the moment of exchanging goods and services. Insterstellar currencies could be a much wider collection than today's global currencies, but it would only be a matter of properly designing a free valuing mechanism for each currency. It is important, though, to keep in mind Polanyi's argument [27] about the failure of the system leading to World War I and II when the gold standard for currency exchange was left behind. If humanity decides the U.S. dollar should not be the common currency, they better think twice before making a serious financial mistake. There is also the problem that an insterstellar civilization would be scattered throughout

thousands of light years. As a consequence, instantaneous transactions would not be possible.

In any case, the fact that an exploration program could be successful, would open the way to a huge amount of new material resources, giving global capitalism new strength, towards the formation of a new and unknown kind of capitalism, which I call interstellar capitalism. Colonial imperialism could be a model to follow in this case.

4. Travelling to the Stars: The Space Jumping Singularity

I do not know when the space jumping singularity will be achieved. I hope it happens before the transcendence singularity, because it would automatically create a new frontier for humanity: colonizing the stars, that is, interstellar travel. That would mean opening the gate to the stars. Of course, it would require knowing where we should jump to. That means creating the technology that would allow us to peer incredibly deep into our galaxy in order to find Earth-like exoplanets, that is, planets comparable in size to the Earth that, for one reason or another, have oxygen (and presumably other gases, innocuous or not) in their atmosphere and running water on their surface. Sagan [9] [10] considers this to become a possibility by using a couple of specially designed telescopes around the orbit of Pluto for stereoscopic vision, in order to find Earth-like exoplanets on other star systems in the Milky Way galaxy.

Figure 1 illustrates space jumping on one space dimension only (the horizontal one, but remember that in principle there are three space dimensions) while using the second dimension (the vertical one) for time.

Notice that there is traveling between point A to B and back (blue line) and then from point A to C and back (red line). All of these travels are instantaneous, meaning they require an amount of time Δ strictly greater than zero. Also notice that there is no time being considered for recharging energy, which should be taken into account, since it is reasonable to expect the need to spend some energy in order to open space for the space jump to proceed.

What is the reason that leads me to think space jumping is possible to be realized in a strictly greater to zero time? It is simply the fact that there is no mental experiment forbidding to travel from one point in space to another instantaneously. Although the special theory of relativity forbids to travel faster than light, it does so when considering a vehicle gradually accelerating in space. What I am considering here is to "jump" out of space in one point of space and "emerge" into space in another quite distant space.

What is the reason the special theory of relativity of Einstein [28] forbids traveling faster than light? Consider an imaginary train traveling towards the right at a speed relatively close to the speed of light. Assume the train is passing by the train platform. This train platform has one person standing as a witness. Imagine that the train is transparent so that whatever happens inside can be seen from the train platform. Imagine light is sent from the bottom of the train to the

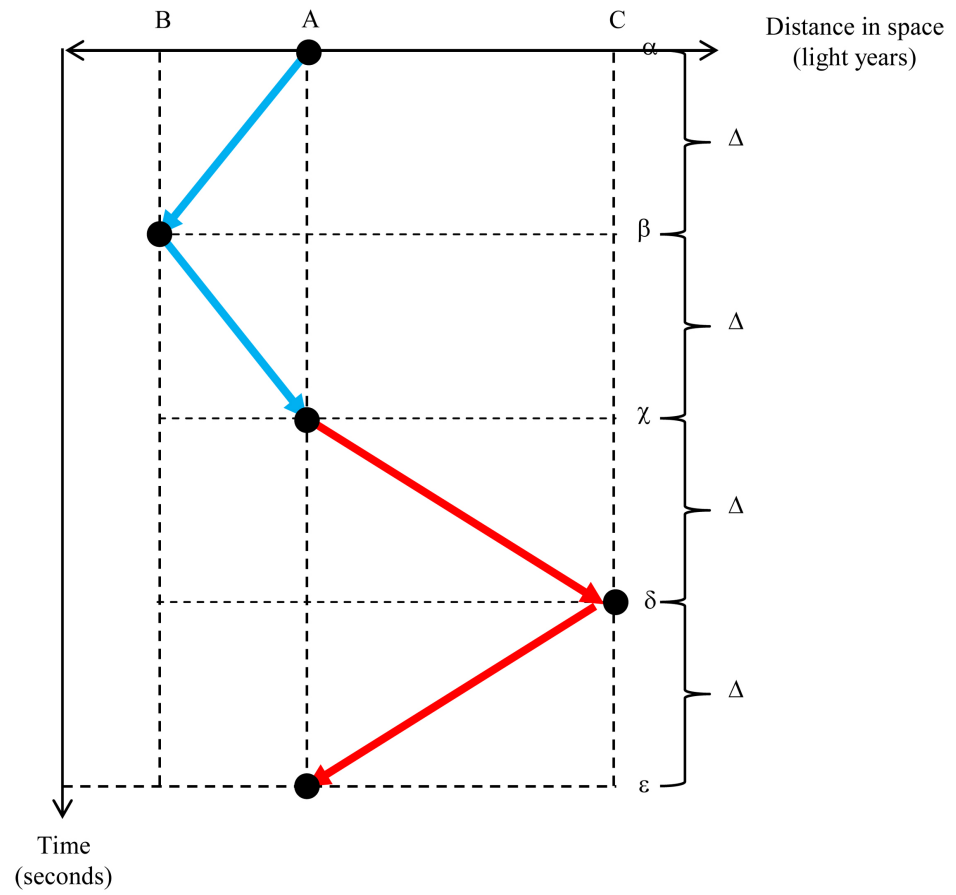

Figure 1. Space-jumping on one space dimension through time.

top of the train. Consider only the top of such impulse of light.

As the train travels, it is possible to see how the top of the light impulse, which maintains the same position when seen from the inside of the train, from the outside of the train it gives the impression it is moving to the right (refer to **Figure 2(a)**). Also consider, what the inside passenger sees. To him, the pulse of light moves straight from the bottom of the train to the top of the train (refer to **Figure 2(b)**). Finally, consider the distance travelled by the train perceived by the person in the train platform. Realize that light travels at the same speed (c), regardless of the relative point of view, as long as there is no acceleration involved, that is, the speed of light is the same for all constant frames of view, where constant frame of view means the object being considered does not experience acceleration.

Let v be the speed at which the train travels, c the speed of light, t_O the time it takes the pulse of light to reach the top of the train when viewed from outside by the train platform witness, and t_I the time it takes the pulse of light to reach the top of the train when seen from inside the train by the train passenger. The basic equation for constant speed, v, is given by Equation (1), where d is the distance and t the time being considered. Equation (2) algebraically solves Equation (1) for the distance, d.

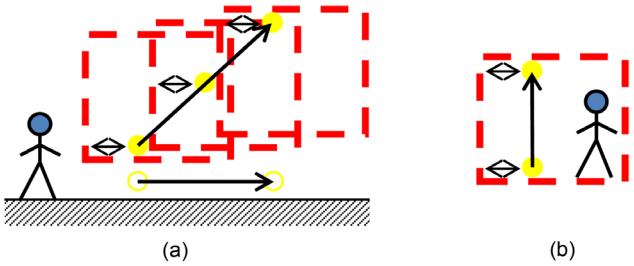

Figure 2. Relative points of view for relativistic traveling when considering a pulse of light. (a) Point of view from the train platform; (b) point of view from inside the train.

$$v = d/t \tag{1}$$

$$d = vt \tag{2}$$

Consequently, the distance travelled by the train in t_O seconds, called d_T, is given by Equation (3). Also, the distance perceived from outside the train travelled by the impulse of light (d_O) during the same time t_O seconds, illustrated in **Figure 2(a)**, is given by Equation (4). Finally, the distance travelled by the impulse of light as seen inside the train by the passenger (d_I) in t_I seconds, as illustrated in **Figure 2(b)**, is given by Equation (5).

$$d_T = vt_O \tag{3}$$

$$d_O = ct_O \tag{4}$$

$$d_I = ct_I \tag{5}$$

The arrangement of these distances is illustrated in **Figure 3**.

According to the Pythagorean theorem (Loomis [29]), the sum of the square of the legs equals the square of the hypotenuse. Equation (6) applies this theorem.

$$d_O^2 = d_T^2 + d_I^2 \tag{6}$$

Substituting Equations (3), (4) and (5) into Equation (6) yields Equation (7).

$$\left(ct_O\right)^2 = \left(vt_O\right)^2 + \left(ct_I\right)^2 \tag{7}$$

Equation (7) is algebraically transformed into Equation (8).

$$c^2t_O^2 = v^2t_O^2 + c^2t_I^2 \tag{8}$$

Dividing Equation (8) by c^2 yields Equation (9).

$$t_O^2 = \left(v^2/c^2\right)t_O^2 + t_I^2 \tag{9}$$

Factorizing t_O from Equation (9) yields Equation (10).

$$t_O^2\left(1 - v^2/c^2\right) = t_I^2 \tag{10}$$

Solving for t_O from Equation (10) results in Equation (11).

$$t_O = \frac{t_I}{\sqrt{1 - \dfrac{v^2}{c^2}}} \tag{11}$$

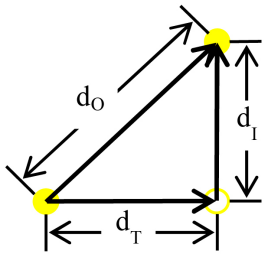

Figure 3. Scheme of the relativistic distances being considered.

As v approaches c, the time outside the train tends to become infinite. It is physically impossible for a given mass to reach the speed of light, because if $v = c$, there would be a division by zero, which would make the time outside the train (t_O) infinite with respect to the time inside the train (t_I).

Nevertheless, the clever reader may realize that in order for Equation (11) to be sustained, it is required to be able to see inside the train at all times. In a space jump, the travelling vehicle is hidden from view during the trip (presumably instantaneous in a time strictly greater than zero).

The space jumping singularity will not likely occur in one single step. I consider a series of four major milestones for the space-time jumping singularity. The first such step (crawling) is space jumping on the surface of Earth. The second such step (walking) is space jumping from the surface of Earth to the surface of Mars and back. The third such step (running) is space jumping from the solar system to other star systems. The fourth such step (flying) is space jumping between galaxies. The coordinate system required for such intergalactic traveling technology goes beyond my current understanding. Due to practical considerations, the latter such step is not being considered in this paper, because, as far as it is known, there is not a center to the system of galaxies, which means it would be impossible to establish a reasonable coordinate system for intergalactic traveling.

5. Space Jumping on Earth

It should become possible to travel from one particular position on Earth to another. Being on a specific location on Earth requires latitude and longitude as well as altitude. The implicit assumption is that the basis for the coordinate system being used is the center of the Earth. Thus, if one travels to another location, the altitude would change. Consequently, potential energy would be gained or lost.

It is natural that when discovering how to have one piece of matter to space jump from one place to another, that the first experiment due would be to have the "engine" allowing space jumping to occur to space jump between two very close points in space, in order to experimentally test for the first time the theory allowing such space jumping. The next step would be to increase the size of the space jumping travelling vehicle plus its load in a relatively short space jump.

Following that would be to achieve space jumping on the surface of Earth using the Global Positioning System (GPS) to guide such travelling, using a vehicle (most likely a car) by travelling from one point to another in such way so as to have surplus potential energy (**Figure 4(a)**) or slack potential energy (**Figure 4(b)**).

In the case of **Figure 4(a)** it would be interesting to see where the additional (surplus) potential energy ends up, whereas in the case of **Figure 4(b)** it would be required to know how much and where to send the extra (slack) potential energy. Both of the latter experiments (**Figure 4**) simply assume changing the position of the vehicle in two dimensions (over the surface of Earth), which can be specified with latitude and longitude coordinates, having the altitude to be due (perhaps) to the loss (**Figure 4(a)**) or gain (**Figure 4(b)**) of energy.

It is also logical to make a free fall experiment. In this experiment, a glider, such as the one from Virgin Galactic (http://www.virgingalactic.com/), gets drop from as high as possible and space jumps from that position to as low as possible, in order to measure energy requirements when there is no change in latitude or longitude but only in altitude and the travelling vehicle clearly has more potential energy at the dropping point than at the re-entrance point (surplus energy space jump). **Figure 4** illustrates the concept. Does such a space jump still require coordinates or is it possible to do it without a guidance system for the travelling? If the latter is true, why is that so?

6. Space Jumping in the Solar System

The second such step (walking) would mean traveling to other planets in the Solar System. That would require considering the Sun at the center of the assumed coordinate system. Although it should be possible to travel from the surface of Earth to the surface of Mars, the precision required for such technological feat could be beyond the uncertainty principle or at least beyond the available technological precision available. But I do not think so. I believe with an accurate enough coordinate system, Earth-to-Mars surface to surface space jumping should be possible.

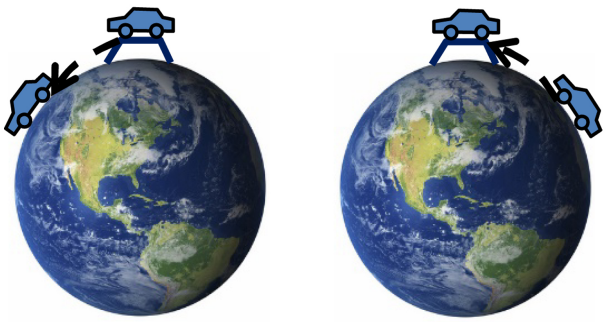

Figure 4. Space jumpimg on the surface of Earth. (a) Surplus potential energy; (b) slack potential energy.

When considering space jumping in the solar system, distance becomes important. The closest and most likely planet for human colonization in the solar system is Mars. Mars circles the Sun in 1.8 years approximately. During its closest approach to Earth it is 3 light minutes away from the planet. Earth is 8 minutes away from the Sun (Sagan [9] [10]). **Figure 5** calculates the minimum and maximum distances to Mars when it is closest and farthest away from Earth, respectively.

As it can be seen in **Figure 5**, the closest Mars can be to Earth is 3 light minutes and the fartest away it can be is 19 light minutes. Although this quantity of light minutes of distance is not prohibitive, it becomes noticeable if the space jumping is not instantaneous. And when considering travelling to Jupiter or Saturn the distance (light hours) becomes important. Thus, it is essential to know for sure whether or not the space jumping actually takes place instantaneously or if it occurs at the speed of light or slower.

For that purpose, an experiment is due. This experiment requires finding two areas separated a large enough distance such as 10 kilometers. The speed of light is approximately 300,000 kilometers per second. Thus, travelling 10 kilometers at the speed of light would take $10/300{,}000 = 0.0000\overline{3}$ seconds. Although this amount of time is relatively small, accurate enough clocks (such as atomic

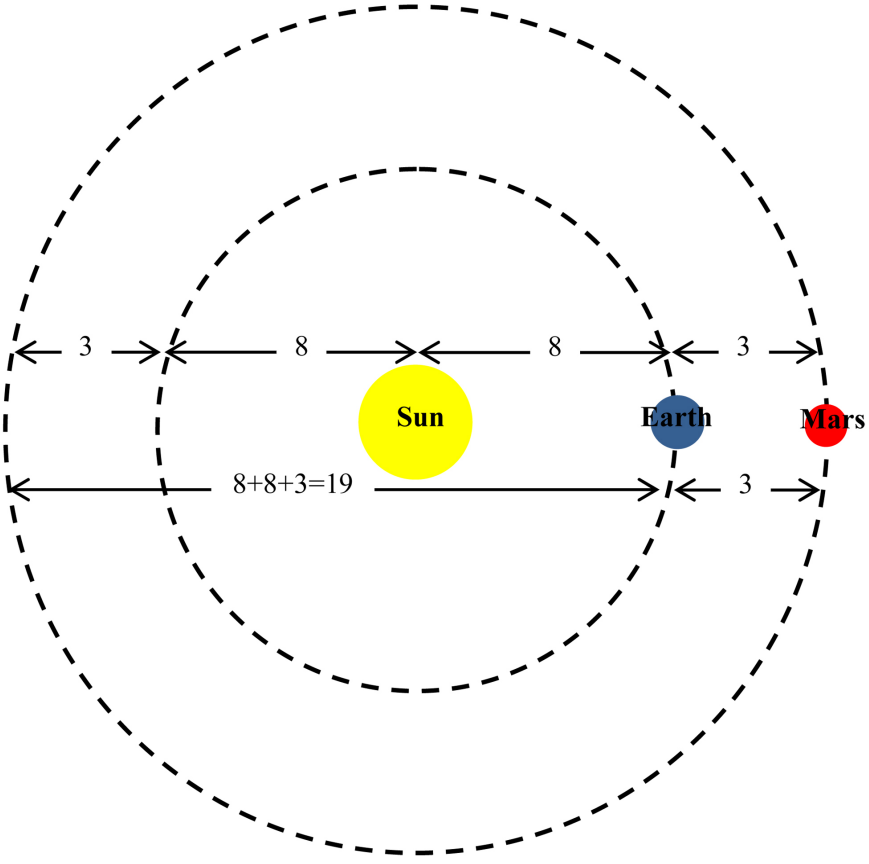

Figure 5. Calculation of closest and most far away distances between Earth and Mars in light minutes.

clocks) can be used in order to find out for sure if the space jump is instantaneous or if it occurs at approximately the speed of light or even slower than that.

In any case, making space jumping between Earth and Mars a reality is much more complicated than space jumping on Earth, because it requires a complex 3D system of solar coordinates. However, it is possible, because the Sun can be considered the center of such system and the planets move around the Sun almost along the same plane known as the solar elliptic. Nevertheless, the slight differences in the orbit of Earth and Mars with respect to the elliptic as well as the precise location on the surface of the planets required for the travelling need to be considered. The problem of gaining or loosing potential energy becomes much more problematic.

Which kind of vehicle should be used? Mars does have an atmosphere, although it is much thinner than the atmosphere of Earth. Thus, the best vehicle for such travelling would be a special kind of helicopter with four rotors such as the typical remote-controlled drones common today. The design of such vehicle needs to consider the difference in the gravitational pull of Earth and Mars as well as the relative altitudes and the different densities of the atmospheres of the two planets. It makes sense to try to send drones to Mars in a space jump from Earth, and also to program an automatic return to Earth of these drones. The development of this technology is very important in order to make Mars colonization a real and very practical possibility.

7. Space Jumping in the Milky Way Galaxy

The third step (running) would be interstellar traveling, that is, traveling to other stars in the Milky Way galaxy. Achieving this technological capability is what constitutes to me the bulk of the space jumping singularity, because it would make possible to colonize Earth-like exoplanets in the Milky Way galaxy, hopefully allowing for millions and millions of people from Earth to colonize other worlds, thus opening the gate to the stars and the final frontier.

Interstellar distances are considerable. The closest star to Earth (Proxima Centaury) is 4.3 light years away (Sagan [9] [10]). Typical interstellar colonization would require travelling hundreds and thousands of light years. Our galaxy (the Milky Way) is 100,000 light years in diameter and 2 light years in width (Waller [30]). Fortunately, there is a center to the galaxy as well as a disc of 2 light years in width along which stars are rotating. Thus, it is possible to create a 3D coordinate system for navigational purposes. However, in this case it is vital that space jump is instantaneous or close to it, because of the enormous amounts of time (hundreds or thousands of years) it would take for insterstellar travelling to take place if such travelling occurs at the speed of light or close to it.

Also, Mars should have been colonized first, having an average population of, say, one million people, because Mars can be used as a departing and arriving port for interstellar ships. This is because Mars has one third of the gravity of Earth, so that it is easier to place in orbit large ships built on Mars having fuel

also created on Mars (although it is possible that water may have to be imported from Earth).

There is a fundamental limit to the precision with which certain pairs of physical properties of a particle, known as complementary variables, such as position x and momentum p, can be known. This is the uncertainty principle, and it states that the more precisely the position of some particle is determined, the less precisely its momentum can be known, and vice versa (Heisenberg [31]). The formal inequality relating the standard deviation of position (σ_x) and the standard deviation of momentum (σ_p) is given by Equation (12), derived by Earle Hesse Kennard (Kennard [32]) later that year and by Hermann Weyl [33], where h is the reduced Planck constant or Dirac constant, given by Equation (13).

$$\sigma_x \sigma_p \geq \frac{\hbar}{2} \tag{12}$$

$$\hbar = \frac{h}{2\pi} \tag{13}$$

The Planck constant (h) equals to 6.626070040 (81) $\times 10^{-34}$ J·s, which equals 4.135667662 (25) $\times 10^{-15}$ eV·s. The numbers in parenthesis are where the estimates are not known with precision.

Notice that interstellar distances are so large that the uncertainty principle may become relevant enough so as not to allow much precision in the positions of the departing and arriving points of the space jumping. That is precisely the reason why large ships may be required, because the space jump may lead close enough to the star system to be explored and then colonized, but regular thrust may be needed in order to approach the Earth-compatible exoplanet.

8. Discussion and Conclusion

It is interesting to ponder on the ultimate nature of humans. What kind of organisms do we truly are? What is, if any, the guiding principle of humanity as history has gone by? In the words of Mr. Smith trying to convince Morpheus to give up, taken from the first *Matrix* trilogy sequel:

I'd like to share a revelation that I've had during my time here. It came to me when I tried to classify your species and I realized that you're not actually mammals. Every mammal on this planet instinctively develops a natural equilibrium with the surrounding environment. But you humans do not. You move to an area, and you multiply and multiply, until every natural resource is consumed. The only way you can survive is to spread to another area. There is another organism on this planet that follows the same pattern. Do you know what it is? A virus. Human beings are a disease. A cancer of this planet. You are a plague. And we are the cure.

Put simply, humanity is like the steam inside a pressure cooking pot. The more people there are, the higher the pressure of the steam is. In order not to let the pressure cooking pot explode, an escaping valve needs to be opened. Space

colonization, first to Mars, and then beyond, until we reach a whole plethora of new Earth-like exoplanets, is precisely the release valve we desperately need. Globalization and all-powerful large corporations monopolizing knowledge (patents) and toying with the global labor markets for the cheapest salaries have made this world too small for comfort. If we want to avoid an all-destroying global war that may be paired up with engulfing crime and chaos, we do need to find a way out, if not to the stars, at least to the colonization of Mars, even if it needs to be without the availability of space jumping technology.

There is a technological inevitability slowly threatening us. It is the eventual emergence (sooner or later) of a superhuman intelligence, being artificial, biological or both. Regardless of the nature of such intelligence, it will want to explore new frontiers for being, and humanity may be in its way. Let us hope than when superhuman intelligence finally reaches us, we will be deep into space colonization, so that such superhuman intelligence can be used to colonize new worlds.

On many occasions we feel alone and we think that feeling alone is due to a lack of company. This is partially true and partially false. If we have company and we are communicating in one form or another with others, we perceive in our minds the echoes of other minds, and that is reassuring.

However, the reality is that each and every one of us is "trapped" in our own minds. Our thoughts, each thought we may have, involves a series of words, images, sounds, tactile sensations, smells, tastes and even the idea of motion. If we wanted to fully express, even if it were one single thought lasting one second, we would require a considerable number of pages to fully express such thought. However, written language and even vision can only, in one seconds, express a very small fraction of what constitutes such thought. It is precisely in this sense that our minds are isolated of other minds due to the limit in the bandwidth of traditional communication channels: vision, tactile sensation, hearing, taste, smell plus kinetic or motion sensation. We are, then, in our minds, isolated from the rest of the world. It is in this sense, in which we are precisely practically alone.

This does not have to necessarily be like this. Imagine for a moment it were possible to directly connect one mind to (an)other(s) by using some advanced technological device. Would my thoughts be understandable to others and vice-versa? In other words, is the language of electrical impulses and activations of different parts of the brain the same for different people?

Some scientists such as Mitchell [34] have been experimenting with these ideas. They want to see if the patterns of brain activation in the brain are equivalent among different people. They have measured brain activity associated to see some noun (either as a word or a picture) and after some machine learning training they have been able to interpret which brain activity corresponds to which nouns. Among all right-handed individuals (since left-handed people have a different although possibly transformable for equivalence arrangement of

patterns) they have found there is a common brain activation language. What wonders could future technology bring to human communication?

In this way, future technology has the potential to bring us closer to each other by breaking the natural barriers imposed by our biological nature and even allowing people to transcend their own minds into machines and artificial consciousness. Maybe some artificial consciousness could be created as a reflexion of our own consciousness, even if the latter requires us to use the mental-machine interface during all of our lives.

It is clear, however, that when the mind gets separated from the artificial consciousness the machine becomes another being, completely different and separated from the original one. Up to what point would it be possible to transfer our own consciousness into an artificial entity? Copertari [11] says that in order to have one being instead of two separate beings, both the thoughts and what some people call the soul would have to be transferred.

The quest for superintelligence (being that biological, artificial or a combination of both) is a trip towards deep inside our own humanity and an attempt at reaching out to others. The quest for interstellar travelling is a trip outwards to the stars and perhaps to reach out to other civilizations (being them technologically based or not).

Sam Harris [35] bases his conclusion of the unavoidability of artificial superintelligence on three assumptions: 1) intelligence is the result of information processing, 2) we will continue to improve our intelligent machines, and 3) we are not even near the top of possible intelligence. Based on these three assumptions he concludes that the emergence of superintelligence presumably artificial (at least to some degree) is inevitable and that it is only a matter of time until there is a superintelligent being. The country, group or organization having such superintelligence will have in its hands great potential of generating incredible knowledge and technology very fast, making them very powerful. The problem is that such eventuality, which I call transcendence will lead to an unbearably brutal disparity, unless we make changes to the way in which we share wealth. It is precisely for this reason that thinking about alternative ways of organizing the production and distribution of wealth is required. The motto of socialism is "to each one according to their capacity", which would be an ideal meritocratic society. It is arguable whether or not we have such kind of society. The motto of communism is "to each one according to their need", which is precisely what we would need if machines can do all of the production of goods and services without human intervention. Certainly, it is very difficult to think about this new way of organizing economy, politics and society, but at least a first attempt at such should be of concern.

References

[1] Kurzweil, R. (2005) The Singularity Is Near: When Humans Transcend Biology. Penguin Books, New York.

[2] Depp, J. (2014) Transcendence [DVD]. Alcon Entertainment.

[3] Boden, M.A. (2016) AI: Its Nature and Future. Oxford University Press, New York.

[4] Harari, Y.N. (2017) Homo Deus: A Brief History of Tomorrow. Harpen Collins, New York. https://doi.org/10.17104/9783406704024

[5] Ford, H. (1999) Blade Runner [DVD]. TimeWarner Home Video.

[6] Seyfried, A. and Timberlake, J. (2012) In Time (El Precio del Mañana) [DVD]. Twentieth Century Fox Home Entertainment.

[7] Gleeson, D., Vikander, A. and Isaac, O. (2014) Ex Machina [DVD]. Universal Pictures International/Film4.

[8] Johansson, S. (2017) Ghost in the Shell [DVD]. DreamWorks Pictures.

[9] Sagan, C. (1980) Cosmos. Editorial Planeta, Barcelona.

[10] Sagan, C. (2000) Cosmos [DVD 7-Disc Collector's Edition]. DZN.

[11] Copertari, L.F. (2017) Cuando la tecnología nos alcance. [When Technology Reaches Us]. Editorial Académica Española.

[12] Kurzweil, R. (2012) How to Create a Mind: The Secret of Human Thought Revealed. Penguin Books.

[13] Zinn, H. (2003) A People's History of the United States. Harper Collins Publishers.

[14] Searle, J. (1980) Minds, Brains, and Programs. *Behavioral and Brain Sciences*, **3**, 417-458. https://doi.org/10.1017/S0140525X00005756

[15] Searle, J. (1984) Minds, Brains, and Science. Harvard University Press.

[16] Turing, A.M. (1936) On Computable Numbers, with an Application to the Entscheidungsproblem. *Proceedings of the London Mathematical Society*, **2**, 230-265.

[17] Turing, A.M. (1950) Computing Machinery and Intelligence. *Mind*, **59**, 434-460. https://doi.org/10.1093/mind/LIX.236.433

[18] Minsky, M. (1988) The Society of Mind. Simon & Schuster Paperbacks.

[19] Moravec, H. (1999) Robot: Mere Machine to Transcendent Mind. Oxford University Press.

[20] Franklin, S. (2001) Artificial Minds. The MIT Press.

[21] Marx, C. (1946) El capital: Crítica de la economía política (tomos I, II y III). [The Capital: A Critique of Political Economy]. Fondo de Cultura Económica.

[22] Harvey, D. (2014) Seventeen Contradictions and the End of Capitalism. Oxford University Press.

[23] Greco, T.H. (2009) The End of Money and the Future of Civilization. Chelsea Green Publishing.

[24] Hallsmith, G. and Lietaer, B. (2011) Creating Wealth: Growing Local Economies with Local Currencies. New Society Publishers.

[25] Lietaer, B. and Hallsmith, G. (2006) Community Currency Guide. Global Community Initiatives, 1-32.

[26] Lietaer, B. and Dunne, J. (2013) Rethinking Money: How New Currencies Turn Scarcity into Prosperity. Bernett-Koehler Publishers, Inc.

[27] Polanyi, K. (2001) The Great Transformation: The Political and Economic Origins of Our Time. Beacon Press.

[28] Einstein, A. (1905) Zur Elektrodynamik bewegter Körper. [On the Electrodynamics of Moving Bodies]. *Annalen del Physik*, **17**, 891-921. (In German) https://doi.org/10.1002/andp.19053221004

[29] Loomis, E.S. (1968) The Pythagorean Proposition. National Council of Teachers of Mathematics.

[30] Waller, W.H. (2013) The Milky Way: An Insider's Guide. Princeton University Press.

[31] Heisenberg, W. (1927) Über den anschaulichen Inhalt der quantentheoretischen Kinematik und Mechanik. [On the Descriptive Content of Quantum Kinematics and Mechanics]. *Zeitschrift für Physik*, **43**, 172-198. (In German) https://doi.org/10.1007/BF01397280

[32] Kennard, E.H. (1927) Zur Quantenmechanik einfacher Bewegungstypen. [On the Quantum Mechanics of Simple Movement Types]. *Zeitschrift für Physik*, **44**, 326. (In German) https://doi.org/10.1007/BF01391200

[33] Weyl, H. (1928) Gruppentheorie und Quantenmechanik. [Group Theory and Quantum Mechanics]. Hirzel.

[34] Mitchell, T. (2017) Using Machine Learning to Study Neural Representations of Language Meaning. https://event.on24.com/wcc/r/1438516/0E77DEF4D12BCB3FD968A0AD34317606?mode=login&email=copertari@yahoo.com

[35] Harris, S. (2016) Can We Build AI without Losing Control over It? https://www.ted.com/talks/sam_harris_can_we_build_ai_without_losing_control_over_it