

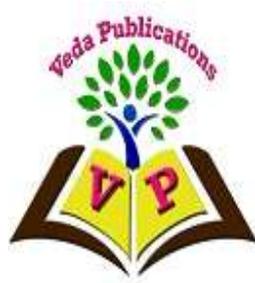


EXPLORING THE TRANSHUMANIST VISION OF MAN-MACHINE SYMBIOSIS IN FOUR MODERN, HARD SCIENCE FICTION NOVELS

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ABSTRACT



In this paper my aim is to analyze four 21st Century hard science fiction novels, which are Charles Stross' 'Accelerando', Alastair Reynolds' 'Revelation Space', Iain M. Banks' 'Surface Details' and Stephen Baxter and Alastair Reynolds' collaborative work 'The Medusa Chronicles' to explore various aspects of a Post-Singular, Posthuman and machine-dominated future driven by an essentially Transhumanist vision of uplifting and elevating humankind by a deep and thorough man-machine symbiosis. The analysis of these novels will help us to see how science fictional works portray a technologically driven future of exponential growth where the only way for the mankind to stay relevant to the cascading impact of constantly accelerating machine intelligence will be to merge their mind and body with the machines. This will, perforce, bring an end to many binary dualistic oppositions based on which the corpus of our present day epistemic system thrives. The paper also includes a discussion of the probability of occurrence of an event like Technological Singularity and the possible ramifications of such an event upon future mankind from an objective and scientific viewpoint.

Keywords: *Science Fiction, Posthumanism, Transhumanism, Contemporary Literature, Neo-Marxist Approach.*

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INTRODUCTION

A possible synthesis between man and machine is already underway when increasingly sophisticated implants and modified extensions are being added to the human body for augmenting the virtual experiences or for helping a man to tide over his physical and mental limitations. Bionic technologies have been used to enhance people's lives which range from robotic limbs to electronic eyes. But in the context of analyzing the man-machine symbiosis and interfusion we should keep our minds open toward the various possibilities which a deep-level man-machine synthesis could bring before mankind. Here machines will cease to be passive, mechanical objects whose existence is bound within obeying the laws of his human master; rather the machines presented in these futuristic hard science fiction novels are often self-aware, superintelligent, powerful and weakly or fully godlike beings who are capable of replicating themselves into infinite forms and can also simulate any physical forms into minutely detailed simulations which are indistinguishable from their original counterpart. Science fiction novels not only tell us stories about a Post-Singular and Post-Human man-machine synthesis but also imply that the entire universe could very well be a titanic instantiation of a relentlessly calculating machine in which it is possible to achieve unthinkable breakthroughs and unforeseen miracles by altering the rules of computation. So to fully extract the endless potentialities of our universe we should be able to discover the ultimate, indivisible and fundamental building blocks or 'bits' from which almost every forms of creation emerge. Marx's theory which posits that in an industrially advanced age machines will cease to be mere extensions or accessories of human beings; rather they will be self-dependant, self-aware appendages able to control and regulate even their human masters. In this changing scenario man will grow slaves to these technologies or mechanical implants and the machines will become his new master. Assimov's three laws which generally form the basis of all robots in a pre-Singular era will also start to lose its relevance in the Post-Singular era when distinction between man and machine will also grow highly irrelevant as a result of a seamless and

complete interlinking and interfusion between mind and the digital world of virtual reality, as well as between man and the machine.

UNIVERSE AS A MACHINE OR A SIMULATION AND MARX'S THEORY OF ALIENATION

The idea that our universe is a simulation is also deeply rooted in comprehending the cosmos in terms of a massive, self-aware and self-contained calculating entity or hardware on which stories of physical events are being written and run like programs and softwares. This study will attempt to look into and analyze the portrayals of the possible consequences of man-machine interaction as presented in various modern hard science fiction novels. The primary methodological framework of this paper is Marx's theory of alienation between the individual and his work or between the individual and the machineries. Marx said that in the pre-Industrial age (before 19th century) the relation between the workers and their apparatuses were different than what they would become in the Industrial era (626). Then the machines were thought of as appendages or extensions of the laborer himself while in the post-Industrial age the machines started to assume the role of one single 'powerful organism' whose appendages the human beings started to become. The entire world is then set in motion by the will of the machine itself which has assumed the form of one self-aware and self-evolving automaton consisting of a number of mechanical and intellectual organs. In the Posthuman era this automaton technology naturally is bound to assume enormous proportions and will control the course of events to an unprecedented extent. This is what is depicted in most of the 21st century works of dystopian science fiction where by various means and ways the machines are portrayed as gradually ascending to the role of a powerful sentient organism which can control, regulate and determine the events on a universal scale. Marx in his 'Manifesto of the Communist Party' (1848) reflects on this aspect of alienation among individuals owing to the rise of machines in industry, "Owing to the extensive use of machinery and to division of labour, the work of the proletarians has lost all individual character, and consequently all charm for the workman. He becomes an appendage of the machine, and it is only



the most simple, most monotonous, and most easily acquired knack, that is required of him. Hence, the cost of production of a workman is restricted, almost entirely, to the means of subsistence that he requires for his maintenance, and for the propagation of his race. But the price of a commodity, and therefore also of labour, is equal to its cost of production. In proportion, therefore, as the repulsiveness of the work increases, the wage decreases." The Pre-industrial tools were thought of as extensions of the expert human body whereas in the Post-industrial era the worker himself becomes an extension of the machines or the tools. The living machinic system assumes the form of a 'living organism' and the working population becomes the limbs to it. In 'Grundrisse' (1857-1858) Marx observes, "the worker's activity, reduced to a mere abstraction of activity, is determined and regulated on all sides by the movement of the machinery, and not the opposite. The science which compels the inanimate limbs of the machinery, by their construction, to act purposefully, as an automaton, does not exist in the worker's consciousness, but rather acts upon him through the machine as an alien power, as the power of the machine itself" (279).

SCIENCE BEHIND THE FICTION – IDEAS AND IMPLICATIONS

Before delving into a full-fledged and comprehensive discussion of the novels, this study will first attempt to look into the science behind the fiction and try to fathom how much relevant these futuristic depictions of mankind getting integrated into machines bodies are to the present day human race. Even though technological expansion always follows an exponential curve in which massive breakthroughs happen to suddenly skyrocket the course of mankind' progress to unprecedented heights yet a brief analysis of the development of ideas and theories in this field of man-machine synthesis will benefit our discussion immensely.

This situation of highly accelerated growth of machine intelligences and man-machine symbiosis becomes even more intriguing and fascinating in a Post-Singularitarian world and even though it is theoretically impossible to predict the occurrence of an actual event of singularity, we can always take closer look at our current track of development to

determine how far or close we are to such a ground-breaking event like a Technological Singularity. Problems like dealing with man-machine synthesis also expose the difficulties that we face at present as a result of our predominantly reductionist scientific approach which seeks to reduce and disassemble an object to its fundamental, reducible components and then analyze them. The problem of mind and machine can be tackled most effectively only when we are fully aware of their real nature and origin and can trace their evolution thoroughly and independently – the organic core of machines and machinic framework of biological substrates: "The problem is that embodied cognition that reduces body to a mere physical instantiation of sensory motor loops does not go deep enough in acknowledging the importance and implications of the biological embodiment for cognition"(Slawomir J. Nasuto, and Yoshikatsu Hayashi. "Anticipation: Beyond synthetic biology and cognitive robotics" *Biosystems*, vol. 148, October, 2016, pp. 22-31). The authors stress the need to go beyond the traditional Western dualistic conception of reality and the mechanistic framework defined by Newtonian causality and this is precisely what the hard science fiction novels attempt to accomplish when they attempt to portray the emergence of super-sentient, part-neurobiological, part-mechanical hybrid beings.

In another paper named "Man-Computer Symbiosis" by J.C.R. Licklider we find references to a symbiotic relationship between mutually interdependent and tightly interlinked human brain and computer mind which according to him can evolve in such a way so as to act as complementary to each other: "Man-computer symbiosis is a subclass of man-machine systems. There are many man-machine systems. At present, however, there are no man-computer symbioses... The hope is that, in not too many years, human brains and computing machines will be coupled together very tightly, and that the resulting partnership will think as no human brain has ever thought and process data in a way not approached by the information-handling machines we know today." (7).

Scientists like Stephen Hawking and Max Tegmark always point out the possibility of a



Singularity event in near future in which machines could effectively wipe out majority of human population. Hawking voiced his concerns in the following words when he said to BBC: "Humans who are limited by slow biological evolution couldn't compete and would be superseded. ... The development of full artificial intelligence could spell the end of the human race. ... It would take off on its own, and re-design itself at an ever increasing rate." Even in the 1940s visionaries like Alan Turing, John von Neumann and others saw how intelligent machines could have unimaginable impact on the whole of humanity. Machines can now perform so many types of complex operations effortlessly: Rotaxane molecular machines can do work against gravity by moving liquid droplets, DNA strands are being utilized for harnessing supercomputer power in DNA Computing, Molecular Nanotechnology attempts to build complex structures by mechanosynthesis guided by molecular machineries which include smart materials and nanosensors, self-healing structures able to repair small superficial tears naturally, use of swarms of coordinated nanorobots, utility fog or a cloud of networked microscopic robots, phased-array optics etc. Use of machineries on nano and microscales can be used to produce massively lethal weapons of mass destruction: "As many as 50 billion toxin-carrying devices—theoretically enough to kill every human on earth—could be packed into a single suitcase" (Dangers of Molecular Manufacturing, 10).

Machines thus seem to be expanding their spheres of influence by going beyond the traditionally defined boundary of dealing with generalized sets of knowledge and generating new ones. Here the idea of Singularity as put forward first by Vernor Vinge and then championed by Ray Kurzweil ceases to appear as merely outlandish and futuristic; rather it seems very much possible that we are perhaps near the edge of Singularity. In fact the more science progresses the more we are learning how much our own mind and body have in common with the functioning of the machines and how both can be manipulated and modified with the help of the other to yield maximum benefits. Man and machine are like two sides of the same coin – each is made for the other. The futuristic landscapes as

depicted in the science fiction novels are thus very much possible in a near or not-so-distant future.

The aspect of science fiction which shall be dealt with in this paper can be summed up to be essentially a Transhumanist one which envisages our future as one in which by application of several revolutionary procedures ranging from genetic modification for sharpening our positive traits and enhancement of longevity, to augmenting our physical capabilities through bioengineering and mechanical implants, we are finally able to transcend the fundamental limitations of our physical bodies with the aid of technology. Our present day path is now more than ever entrenched towards realization of the transhumanist ideals and visions by following an exponential curve of progress. Ilkka Tuomi states: "According to Kurzweil's "law of accelerating returns," technical change is generated in an evolutionary process where the outputs of the process are used as inputs in the next phase of the development. This leads to exponential growth. Kurzweil maintains that the rate of exponential growth itself increases. When a particular evolutionary process becomes more effective than its alternatives, greater resources are deployed for the further progress of the effective process" (Kurzweil, Moore, and Accelerating Change, 3-4). While following this curve of progress several known theories need to be altered and modified as for example the mechanistic Newtonian causality as an explanatory methodological framework for describing the workings of both animate as well as inanimate objects and the western tradition of dualistic compartmentalization of mind and matter. Another aspect that prevents a seamless integration between man and machine is that our consciousness does not perform in the same way as machines do. Human consciousness is the product of several non-linear and unpredictable interactions among billions of neurons and we simply do not possess enough computational resources to simulate each and every aspect of such a complex process.

Finally, in order to explore whether our Universe itself works like a gigantic, sentient entity performing countless operations in any given instance to generate all forms of observable phenomena and processes we have to find the



ultimate fundamental limit into which the fabric of reality itself can be divided. The fabric of the universe is its space-time and the threads that bind it together to form the smooth and continuous whole should necessarily be quantum in nature. The process of entanglement of each quantum particle with its nearest neighbors is an endless process which produces a series of interlinked nodes in the network and the nodes are tensors joined together by entanglement and just like a digitally reproduced picture we need to be able to discretize the whole into its innumerable, tiny, constituent parts. A digital picture can be divided into pixels and any 3-D object can be divided into voxels and the fundamental quantities of our universe, i.e., space-time and energy can be quantized in the form of Planck units. Sir Roger Penrose also thought of the relationship between quantum mechanics and general relativity in terms of curvature caused by superposition of quantum states which remains in such state until each of such superpositions become unstable upon crossing the Planck scale of 10^{-35} m only to collapse to one of many possible states (Penrose, *The Emperor's New Mind*, pp. 475–481 & "On Gravity's Role in Quantum State Reduction". *General Relativity and Gravitation*). So the Planck quantities of Energy, Mass and Momentum can be taken as fundamental quantas. Whether we are ready to accept the Multiverse theory or the idea that there is no 'outside' in the eternal infinite all-inclusive Universe which holds only finite number of universal sets of phenomena/state potentials which is being processed and re-cycled ceaselessly through various local and collective aeons and only those phenomena are manifested which the physically effective features and dynamics of the fundamental forces are capable of driving, the thought whose undercurrent relentlessly runs behind all those ideas is that the Universe evolves like a calculating, self-aware, multidimensional, godlike machine. Science fiction novels give us a glimpse into the future dominated by self-aware machines or Posthuman beings – all emerging as a result of a man-machine fusion.

Though the idea of achieving a complete and full-functioning symbiosis between man and machine belongs to the realm of Transhumanism through which transhumanists aim at attaining a selective

elimination of undesirable traits and careful inculcation of only the most desired qualities among humans often their thoughts pose striking resemblances to the highly stigmatized field of genomics in which with the help of advanced techniques of selective genetic modification Nazis aimed to create a race of people nurturing only desirable heritable characteristics. Transhumanists though abstain from using any force or coercion to impose the augmentation procedures upon general populace. Transhumanists like Lincoln Cannon only puts emphasis upon man's journey from his present baseline form to a more intelligent, sophisticated, powerful and ultimately superhuman form like God himself. This is the core of his "The New God Argument" which envisages an evolutionary cycle in which each created being first deifies and worships his/her superhuman maker till he also attains the godlike status and starts creating beings in his own image who in turn grows advanced, achieve awareness and self-independence till arriving at a critical stage when the created also surpasses his master thus keeping the cycle intact ("*Analytical Review of Lincoln Cannon's The New God Argument*"). All these images appear time again in different places across different works of modern, post-Dystopian, hard science fiction novels. So in the next section I shall be analyzing some major works of 21st Century Dystopian Science Fiction novels to analyze how powerful machines and augmented human beings will evolve and adopt to the changes in the Post-Singular world and what will be the consequences of any such deep-level symbiosis between mind and matter.

DISCUSSION

In Charles Stross' novel 'Accelerando' (2005) we find the protagonist Manfred Macx allows his consciousness to be distributed and mind to be uploaded in different virtual reality environments. Here man and machine continue to exist in a mutually beneficial symbiosis and each is dependent on the other for its own realization. In an environment like this voices, sensory impressions, images, dreams, perceptions and streams of data can all be intercepted, encoded, represented and manipulated by means of machines and computational substrates. Here not only the external



appendages, accessories and apparatuses have been treated as machines but the entire reality or the Universe is depicted as one giant, sentient, relentlessly calculating machine. Their actions, operations and executions are based on their capacity or intrinsic processing power. The term machines no longer include non-sentient, inorganic and dead substances incapable of thinking, feeling or evolving and thus subservient to man's will; rather it is the man himself who has been portrayed as a creature being aided, guided and controlled by machines. The rules of Universe are mechanical, the movement of planets, the evolution of life, origin of life, processing of information, conversion of matter to energy and vice versa are all mechanically guided by a set of inviolable principles. There are potential dangers lurking in the fact that all the machines might be nearing their maximum possible peak of processing power: "About ten years after that, the solar system's installed processing power will nudge the critical 1 MIPS per gram threshold - one million instructions per second per gram of matter. After that, singularity - a vanishing point beyond which extrapolating progress becomes meaningless. The time remaining before the intelligence spike is down to single-digit years" (Accelerando, 34). The protagonist Manfred is about to transcend his transhuman state by virtue of complete assimilation of raw machinic processing power with his own physical self thus augmenting and re-energizing his baseline abilities: "The metacortex - a distributed cloud of software agents that surrounds him in netspace, borrowing CPU cycles from convenient processors (such as his robot pet) - is as much a part of Manfred as the society of mind that occupies his skull; his thoughts migrate into it, spawning new agents to research new experiences, and at night, they return to roost and share their knowledge" (Accelerando, 35). The fusion of technology with the market system also brings unforeseen consequences. Market system itself is conceived as a peculiar machinery which makes the human being live under the illusion of being free while incarcerating him to the abstract pattern and formulae of maximization of profit: "the market itself is an abstract machine!" Manfred's aim of giving away ownership or patents of many important discoveries also can be analyzed

in the light of Marx's theory of alienation of the individual under the attack of machinery. Marx thought of alienation as resulting from the separation of the worker from ownership and Manfred in the novel has deliberately adopted this attitude of giving away his ownership as he believes in a radically new and completely modified version of an economic system in which technological progress will be the sole determiner and controlling force of the market and productivity. This novel also shows us that one of the most significant roles that machines will play in fortifying the Posthuman civilization in the future world will be based upon extraction of maximum amount of information from all ordinary matters and for that purpose the Posthumans will have to dismantle every object and convert every mass around them into computational substrate: "The computing power of the solar system is now around one thousand MIPS per gram, and is unlikely to increase in the near term - all but a fraction of one percent of the dumb matter is still locked up below the accessible planetary crusts, and the sapience/mass ratio has hit a glass ceiling that will only be broken when people, corporations, or other posthumans get around to dismantling the larger planets" (Accelerando, 121-122). MIT professor Seth Lloyd, in an article entitled "Computational Capacity of the Universe" ventured to calculate the computational power of the entire universe and he found that the total computing power of the entire universe starting from the occurrence of Big Bang itself is around 10^{120} logical operations which can be calculated by analyzing the computing potential of quantum particles. This could either point towards the power required to create a perfect simulation of our physical universe on a quantum computer or could possibly represent the upper limit to the power of performance of our universe as a computer. This is essentially the picture of the digital universe that the Post-Singular, Post-Human novel 'Accelerando' endeavors to portray. In 'The Physics of Immortality' by Frank Tipler the author argues that just before the final moments when our universe will come to an end a sudden turnaround will occur in which the entire Universe will be converted into a final singularity which will generate one final burst of infinite energy and computing power with which it



would be able to simulate entire history of the universe – its past, present and even the future. Thus this event dubbed as Omega Point will be able to resurrect everything from their death or the state of maximum entropy to reawaken and reconstitute every possible configuration to its appropriate form from its state of utter disorder and chaos. Various Cyclic Cosmology models like Baum–Frampton model also portray a hypothetical scenario much like this one in which just 10^{-24} seconds or less before the occurrence of a Big Rip, a turnaround occurs when one causal patch full of only Dark Energy with zero or vanishing entropy containing absolutely no quark, lepton or force carrier will be retained and restored as our universe.

In fact modern science conceives not just non-living objects but also every living being and its components as mass storage and highly efficient computing devices. A human being possesses two sets or 23 pair of chromosomes which represent the diploid genome containing about 6 billion base pairs and a single byte or 8 bit combination can represent not more than just one DNA base pair. So a diploid genome occupying a total of over 6 billion base pairs can potentially store 1.5 gigabytes of data and as each human being has around 100 trillion cells even after discounting all the haploid sperm and egg cells in the body our body's diploid ones are capable of storing data equivalent to 1.5 Gigabytes x 100 trillion cells = 150 trillion Gigabytes or $150 \times 10^{12} \times 10^9$ bytes = 150 Zettabytes (10^{21}). So potentialities of utilizing biological substrates or constituent components as units of computing are limitless and the demand placed by these operations on our computational resources are equally outrageous. Even when the technical difficulties involved in such daring feats are once surpassed it cannot be said to yield only unmixed blessings but can open Pandora's box for the entire mankind. Thus there are two ways of arriving at a Posthuman stage as depicted in the science fiction novels – either by transforming ourselves radically with the help of the machines and advanced technology or by uplifting the computer intelligences to the level of strong AIs. Though our efforts to create a direct neural link to information is currently limited at the visual level only which is aiming at amplifying our spatial visualization and

manipulation capabilities, yet with the rapid advancements in technology there will definitely be augmentation procedures available for each of our sensory perceptions like auditory, sensory and tactile capabilities. Different thinkers have answered to the question "Can a machine think" from different viewpoints. John Searle in his 'Minds, Brains and Programs' has given answer to the question in the following way: "Could a machine think?" My own view is that only a machine could think, and indeed only very special kinds of machines, namely brains and machines that had the same causal powers as brains. And that is the main reason strong AI has had little to tell us about thinking, since it has nothing to tell us about machines. By its own definition, it is about programs, and programs are not machines. Whatever else intentionality is, it is a biological phenomenon..." (Minds, Brains and Programs, 14). Professor Seth Lloyd calculated the computational power of an ultimate computer which can be formed by compressing a kilogram of matter into a black hole singularity of radius 1.485×10^{-27} meters. It would last for only about 10^{-19} seconds before being evaporated in Hawking Radiation but if utilized it could theoretically function at a peak performance rate of 5×10^{50} operations every second thus ultimately performing about 10^{32} operations on 10^{16} bits.

In various science fiction novels we frequently come across many exotic forms of matter being used as ultra-efficient computational devices like degenerate stars, neutron stars, white dwarves and computronium based on femtotechnology etc. These seek to unify man and machine in such a harmonious whole that concepts like mortality, life, death etc all lose their significance. In Welsh author Alastair Reynolds' 2000 science fiction space opera novel 'Revelation Space' we come across such an exotic object named Cerberus which is in fact an artificial machine in orbit of the neutron star Hades that encompassed several layers of technology from three distinct generations of superintelligent alien civilizations. The object acted as a powerful computational substrate. Here we find how some highly evolved alien intelligence can transform dumb states of matter into powerful computational substrates which can create, sustain



and nurture a parallel world in an immersive environment of hyperreality. The spacetime hidden behind the curtain of Event Horizon of a black hole and consequently separated from the rest of the universe ceases to exist as a self-contained entity sustaining different strands of binary dualisms; rather space and time here melt and merge into one another and ripples of causal shocks can at any given time quantum tunnel back into the past at a time when the black hole was about to form as a result of some supernova explosion. At that moment the streams of particles emanating from futurity can hold back and delay the catastrophic collapse of matter into black hole and this can make the object to exist indeterminately in a state which is neither a pure neutron star nor a complete black hole. This is what Cerberus really is: "The object settled on a stable configuration whereby its paradoxical nature was not immediately obvious to the outside universe. Externally, it resembled a neutron star -- for the first few centimeters of its crust, at least. Below, the nuclear matter had been catalysed into intricate forms capable of lightning-swift computation, a self-organization which had emerged spontaneously from the resolution of its two opposed states. The crust seethed and processed, containing information at the theoretical maximum density of storage of matter, anywhere in the universe" (Revelation Space, 321). Machines in the Posthuman or Postsingular era, as we can see often are limited by only a handful of fundamental laws like theoretically possible upper limit of maximum storage of information. The Hades matrix is such a computational substrate which can store and sustain virtual copies of actual individuals. Ana Khouri describes the strangely patterned surface design of Cerberus' crust in a detailed but delicate manner. A powerful machine in the Posthuman era can support and sustain multiple levels of reality in a highly efficient manner just like the Hades matrix which contains multiple strands of reality like macroscopic, microscopic, nuclear, sub-nuclear and even quantum.

Iain M. Banks' novel 'Surface Details' (2010) describes various ways in which machines act together to construct a Posthuman atmosphere of gruesome violence, endless agony, continuation of life full of punishments even after death and rigorous

enforcement of authority by means far beyond the scope of understanding of mere mortals. The atmosphere created here is both techno-scientifically sublime and grotesque beyond recognition. Here the mind states of the people are often encoded in some computational matrices with the help of neural laces which are some type of neural induction devices. A neural lace can provide one with the chance to live forever albeit in a simulated environment in which one's recorded mind-state can evolve independently of external influences. Neural laces "were the sort of device that highly advanced aliens who'd started out squidgy and biochemical -- as squidgy and biochemical as Sichertians, for example -- and who had not wanted to upload themselves into nirvana or oblivion or wherever, used when they wanted to interface with machine minds or record their thoughts, or even when they wanted to save their souls, their mind-states" (Surface Detail, 110). Machines in this world themselves are demonic and demons are mechanical, cold and cruel: "The osteophagers were specialist demons, flesh- and bone-eating scavengers who lived off the carcasses of those re-killed either in Hell's never-ending war or just in the normal course of its perpetual round of mutilation and pain. The souls of those they ate would already have been recycled into fresh, mostly whole if never entirely healthy bodies better able to appreciate the torments in store for them" (Surface Detail, 50). There are machines which are not only vicious and relentless in their act of calculating infliction of pain in preordained doses but are also programmed to prolong the excruciating pains of its victims. In this novel we see machines capable of creating almost anything it is commanded without the help of any further instruction from an external agent. It is the act of machines themselves which can destroy all semblance of reality and can pave the path for a seamless and most harmonious integration between man and machine by virtue of its power of assimilating any foreign entity to its very core of being. In this process of integration machines split a human mind into rich and highly variegated array of multitudinous strands with a high level of deconstructive sophistication and then from these strands the machines weave a new fabric of reality while providing each concentric shells of



consciousness with an endlessly extrapolating and incessantly intensifying sense of connectedness to a new core of being: "She was entirely part of the machine, feeling its sensory, power and weapon systems as perfect extensions of herself and connecting with the little ship's AI as though it was another higher, quicker layer of tissue laid across her own brain, tightly bundled, penetrated and penetrating via her neural lace and the network of human-mind-attuned filaments within the ship's dedicated pilot interface suite. At such moments she felt she was the very heart and soul of the ship; the tiny animal kernel of its being, with every other part, from her own drug-jazzed body out, like force-multiplying layers of martial ability and destructive sophistication, each concentricity of level adding, extrapolating, intensifying" (Surface Detail, 447-448). In the Posthuman and Post-Singular science fiction novels we find the distinction between man, machine and meta-human artificial intelligence getting destroyed and emerging as an entirely new Posthuman entity. In Stephen Baxter and Alastair Reynolds' collaborative work 'The Medusa Chronicles' (2016) we find the protagonist Howard Falcon coming back to life even after losing his life in a lethal accident. He comes back to life as a posthuman being – half human, half machine. During the course towards Falcon's rejuvenation and reincarnation of his broken self we find machines being continually integrated for modifying, restructuring and reorganizing his entire nervous system as well as his sense of being. Machines thus have the power to provide man with a new pathway for re-establishing his sense of self by rediscovery and rearrangement of his previously disorganized system of neural and physical apparatuses: "They needed to establish a connection between what was left of Falcon and the equipment that would sustain him for the rest of his life. And that meant reading information from, and writing information to, what was left of his broken nervous system... New communication pathways had to be built. So microelectrodes were lodged within Falcon's brain – in the motor cortex area responsible for physical movement, and in the somatosensory cortex, which governed the sense of touch. More sensors were placed in the lumbosacral region of his spine with a

control hub to link the brain to the lower limbs. Once it was possible to transfer digital information into and out of the nervous system, a suite of prosthetic body parts was brought in and tried, one by one, each of them riddled with microsensors that communicated continually with the devices anchored to the brain and spine" (The Medusa Chronicles, 25). This is the future of prosthetics that machines will help man realize which involves discovery and establishment of a novel and harmonious equilibrium between body and mind. This new relation between body and mind might not initially be complete and self-dependant but hold the potentiality to transform itself into something novel and revolutionary with the progress of time. But the dichotomy between man and machine often comes into open conflict and many characters even in the Posthuman setting of the novel are depicted as being reluctant to place man and machine on an equal footing and that is why in one place a character named Webster tells Falcon that though his life is the gift of a cutting edge technology and revolutionary scientific inventions, machines should not be placed alongside with the human beings: "Machines are machines, to be kept separate from humanity." Falcon later realizes that he is "the only true cyborg. The only living symbiosis of man and machine." (The Medusa Chronicles, 28). Falcon's cybernetic enhancements have equipped him with unforeseen capabilities and superhuman prowess but he is not yet fully immortal or invincible; rather he represents a being stranded in a state of transition between two orders – one of being human, another a fully sentient and self-aware machine: "Falcon's cybernetic surgery left him with superhuman capabilities but isolated from mankind, for there will be no more such experiments. But Falcon "took sombre pride in his unique loneliness – the first immortal, midway between two orders of creation. He would . . . be an ambassador . . . between the creatures of carbon and the creatures of metal who must one day supersede them. Both would have need of him in the troubled centuries that lay ahead.'" (The Medusa Chronicles, 2).

In a Transhuman or Posthuman world intelligent machines would constitute the fundamental building block of a magical reality in which highly advanced forms of science and technology would radically



transcend the very definition of reality and finally, when man and machine will be start getting entangled in a complex web of powerful symbiosis the very meaning of life and death will also lose its meaningfulness. Machines supersede the identity of a normal individual in a Post-Singular era when intelligent machines are integrated within the body of an ordinary individual; they destroy the integrity and wholeness of the individual and set new horizon beyond which they aspire to reach. Machines armed with the power of consciousness and sentience, know no limit and refuse to be bound by any traditional set of binary division, categorization and restriction. For a normal human being various forms of experiences not just define and delimit his scope of personality but help him to form a clear and sharply defined image about one's own self, while in case of machines there is no such boundary or limitation once they attain the level of sentience which would enable them to gain an unprecedented amount of autonomy. Machines, once integrated within the body of an individual can help him to overcome various obstacles in his way towards attainment of Posthumanity but this would also entail destruction of many previously cherished systems of values. Machines provide one with the hope of rejuvenating one's self even from the grasp of death as in the Posthuman world death is no longer seen as an obstacle but a temporary state of inactivity and stupor from which one's consciousness or sense of self can be recovered with the help of science: "...death is not a necessary condition for Machines. We are all potentially immortal. And yet death has come to this place. I try to simulate the experiences of those Machines as the accident happened, as the realisation of termination came to them. I try to emulate their internal processor states at the time" (The Medusa Chronicles, 80). But as machines can reach an almost unforeseen level of intelligence and cognitive capability once equipped with a dynamically evolving state of consciousness we find that any experiment like emulating other's cognitive pattern of behavior or empathizing with his sorrows and stresses can engender serious repercussions even within the sense of awareness of the machines. In this novel we find description of consequences of such experiments conducted upon a

bionic soldier named Adam who is shown to be gradually developing his own unique emotional pattern while emulating the mental stress of those machines which were once destroyed with him. Adam shows "...a shift in its conceptual modelling of both itself and the other Machines. In attempting to simulate the mental states of those Machines that were destroyed, it is emulating, at an admittedly low level, some of the internal conceptual modelling that we humans take for granted" (The Medusa Chronicles, 83). Machines even in the Posthuman world of this novel are still designed with primarily one aim in mind which is to execute any specific task most efficiently and careful steps are also taken regularly to ensure that they do not overstep that mark. This spike in the conceptual processing thus implies some unexpected type of shift in the fundamental paradigm of machine intelligence and cognitive behavioral pattern.

Memory forms an indispensable element of identity formation for both an individual as well as a bionic and without the aid of memory all hierarchy of identity will crumble to naught. Memories help a machine or an individual human being to define, describe and reinforce his place in the grander scheme of things based on pattern recognition, identification, efficient information processing and cognition. Without memories one cannot relate himself to a larger background of things occupied by entities which bear resemblance to the one within whom a void has been created by lack of memories. Pure machines or pure human beings are far easier to control than the symbiotic organization of man-machine manifest in the form of cyborg being. Technologies like life extension and virtual reality place man in control of a world full of immense possibility which if harnessed to its full extent can produce unimaginable consequences. But this highly ambiguous "cyborgized state" of being goes definitely beyond what many technocrats and scientists have initially dreamt of – it provides the entities with a sense of awareness and some scintillating rays of sentience which borders on human even while it is shrouded in cocoons of machinic exoskeleton: "One ambiguous benefit of his cyborgised state, which had revealed itself only slowly over time, was a virtual immortality. Life-



extension treatments were common now, but Falcon was easier to maintain than a fully normal human...Indeed his lack of organs, of stomach and liver and genitals, rendered him calmer than most, it often seemed to him. A calm, passionless witness to centuries rolling like tides across the solar system" (The Medusa Chronicles, 103). Machines and individual human beings normally share a separate and isolated state in the hierarchy of beings in a progressive society based on the benefits of science and technology; but in a Post-Singular society driven by quantum leaps of science and technology self-aware machines obliterate this binary division between man and machine and usher in an era of deep, multi-layered and mutually interconnected symbiotic association. Machines exist at the points of intersection of different strands of world-events in a complex universal network of causality most of which is invisible to the common human beings stranded in the time-bound continuum of limited perspective. In the post-Singular stage when machines will be assembled thoroughly within the biological substrate of the individual human beings or mind-uploading or consciousness restoring technologies will become prevalent any distinction between the machine and man will be lost and each will be interchangeable with respect to the other. The machines in the Posthuman era derive their strength from the power of parallel processing and distributive intelligence. In this novel we also find how machines once they grew sufficiently powerful and intelligent began to dismantle and destroy most of the dumb, insensible matters to transform them into substances full of computational potential. Even the destruction of planets became a trivial act and the machines then start converting entire planets into computronium substances: "Humans needed worlds. Machines did not need worlds. What they did covet was the stuff worlds were made from... It was trivial, in the end, to dismantle a planet. One needed only to overcome the planet's binding energy – in effect, to haul all the fragments of the world out of its own gravity well... A planet was a lump of matter, much of which was inaccessible and unusable, whose only useful function was to generate a stable gravitational field. The Machines now took the dead matter of Mercury and made it, essentially, into copies of themselves.

Into a great Host..." (The Medusa Chronicles, 180). The Host is a type of collective intelligence operating with powers and motives that easily go beyond the scope of ordinary human understanding. With the advancement of the machines and improvement in their intelligence new vistas of hitherto unexplored realms of physics begin to get opened: "Is this another aspect of the Machines' advanced physics? We've long theorized that you could create a designer spacetime, perhaps using some kind of coherent graviton engine, shaping mass-energy and gravity the way you wanted – such as to build a wormhole, or achieve such feats as faster-than-light travel by causing spacetime to ripple and surfing the resulting wave . . . The fact that the warping induced by a mass-energy the size of the sun's deflects a ray of starlight through no more than a thousandth of a degree is a mere engineering detail" (The Medusa Chronicles, 215). All forms of obstacle toward the path of self-realization begin to get destroyed by the increasingly sophisticated and powerful machines.

This self-realization, however holds different meaning for the humans and the machines. Machines can both create as well as destroy and their purpose often goes beyond what even their human makers originally envisioned. They are not burdened with various emotional and psychological problems like pangs of conscience, moral and ethical considerations, subtlety of consciousness and variability of mind etc. Machines like Assemblers which are in fact modified Von Neumann replicators which convert dumb matters them into high-performance computational matter and they use Sun's output to perform their tasks: "Assemblers were von Neumann replicators, a variety of specialised Machines that had used Mercury's sunlight and minerals to make copies of themselves: Machines that fed on the planet, like flesh-eating bacteria. From the beginning the assemblers had been firing material up into space to build what had become their huge spaceborne construction project, the sunshield hovering over Mercury" (The Medusa Chronicles, 171). Machines consume the matters in mercury not only to build computronium-like substances but also use them as cannons or projectiles when they perceive any threat.

**CONCLUSION AND IMPLICATIONS**

Thus under the light of Marx's Theory of Alienation I have shown how various science fiction novels of 21st Century shows a society or a world driven by pure Transhumanist ideals of merging of man and machine and Posthuman ideal of sublimating human self to the level of weakly godlike being often becomes the slaves to machines. Though theoretically speaking it is quite impossible for the intelligent AI beings to enslave and supersede their human masters unless they find some way to replicate the model of human brain itself with all its operational complexities and intricacies yet it is not at all impractical to imagine the advent of an era in which machines will assume total control over the entire mankind. Man will not only be alienated from his world of fellow human beings and objects of production but also from his own self as machines will replace his human part with a machinic one. In the long run, with the exponential growth of technology all differences between man and machine will be annihilated and each will merge into another and there will be virtually no perceptible difference between a million-fold enhanced human brain with the aid of nano-scale neural implants and any artificial intelligence or computer architecture that can simulate the brain's abilities for perception, interaction and cognition with enhanced and expanded efficiencies and primarily based on the reverse-engineering of the human brain. The article thus not only aims to present the various ways in which the picture of a future driven by Technological Singularity and man-machine symbiosis is portrayed across various science fiction novels but attempts to show how far the portrayal corresponds to the situation of our world when we are nearing to a possible breakthrough in the fields of quantum-mechanical, and nanotechnological breakthrough. So any technologically driven phenomena like a Singularity will continue to grow at an exponential rate affecting everything inside the future light cone of it and the hope of the mankind to stay relevant in such an era of hyper-accelerated progress will rest highly, if not completely on their readiness to merge themselves with the machines.

REFERENCES

- [1]. Reynolds, Alastair (2000). *Revelation Space*. Gollancz. United Kingdom.
- [2]. Reynolds, Alastair; Baxter, Stephen (2016-05-19). *The Medusa Chronicles*. Orion. Kindle Edition.
- [3]. Stross, Charles (2005). *Accelerando*. Ace. United States.
- [4]. Banks, Iain M. (2010-10-07). *Surface Detail (Culture series)*. Little, Brown Book Group. Kindle Edition.
- [5]. Kurzweil, R. (2009, March 23). *The Coming Merging of Mind and Machine*. Retrieved from <https://www.scientificamerican.com/article/merging-of-mind-and-machine/>.
- [6]. Musto, Marcello. *Karl Marx's Grundrisse: Foundations of the Critique of Political Economy 150 Years Later*. London: Routledge, 2008. Print.
- [7]. Nicolaus, Martin. "The Unknown Marx," *New Left Review*. March–April 1968.
- [8]. Licklider, J.C.R., "Man-Computer Symbiosis", *IRE Transactions on Human Factors in Electronics*, vol. HFE-1, 4-11, Mar 1960.
- [9]. Lloyd, Seth, "Computational Capacity of the Universe", *Physical Review Letters*, Vol. 88, Iss. 23 — 10 June 2002.
- [10]. Penrose, Roger (1999) [1989], *The Emperor's New Mind (New Preface (1999) ed.)*, Oxford, England: Oxford University Press, pp. 475–481.
- [11]. Alienation. *The New Fontana Dictionary of Modern Thought* (1999). Allan Bullock & Stephen Trombley, editors.
- [12]. Searle, John. R. (1980). *Minds, brains, and programs*. *Behavioral and Brain Sciences* 3 (3): 417-457.
- [13]. "Dangers of Molecular Manufacturing." *Center for Responsible Nanotechnology*. 2014. Web. 19 July 2014.
- [14]. "Stephen Hawking warns artificial intelligence could end mankind". [www.bbc.com](http://www.bbc.com/news/technology-30290540). Web. <http://www.bbc.com/news/technology-30290540>. 2 December 2014.
- [15]. Killian, Timothy. "An Analytical Review of Lincoln Cannon's The New God Argument". *transhumanity.net*. Web. October 17, 2016.