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Auto-Catastrophic Theory: the necessity of self-destruction for the formation, survival, and termination of systems

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Abstract Systems evolve in order to adjust and survive. The paper's contribution is that this evolvement is inadequate without an evolutionary telos. It is argued that without the presence of self-destruction in multiple levels of our existence and surroundings, our survival would have been impossible. This paper recognises an appreciation of auto-catastrophe at the cell level, in human attitudes (both as an individual and in societies), and extended to Earth and out to galaxies. Auto-Catastrophic Theory combines evolution with auto-catastrophic behaviours and innovative machinery by offering new themes of understanding their merging such as (a) protogenic and deuterogenic auto-catastrophic processes, (b) protogenic and deuterogenic survival processes, and (c) '*alive*', partially '*alive*', and non-'*alive*' systems. The value of self-destruction relies on a numerical stability within a system and correlational relationships between systems. Auto-Catastrophic Theory provides novel justifications why artificial intelligence: (a) is crucial to overcome the extinction of humanity (via H^+), (b) is crucial to offer indirect survival of humanity (by saving its history), and (c) is at the same time a threat for humanity. These novel justifications and themes, developed by combining evolution with catastrophe as well as innovative machinery, expand our knowledge of how best to handle fresh challenges ahead.

Keywords Artificial intelligence · Auto-catastrophe · Evolution · H^+ · Telos

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Death is an evolutionary telos. It is imported into any living entity, turning death into an auto-catastrophic mechanism. It is supported that auto-catastrophic mechanisms have been essential for our survival and they should be considered for assisting the continuation of our existence via H^+ ideology, medical improvements, and nanotechnology. The problem is that humanity has always been, and still is, keen on its survival mechanisms, which leads to an underestimation of auto-catastrophic procedures. Auto-catastrophe is supported here as the most essential mechanism of our advancement. Darwin's (1859) theory emphasises evolution from the perspective of the survival processes. The paper analyses evolution from the auto-catastrophic practices' viewpoint. Auto-catastrophic mechanisms may carry precise answers with respect to why artificial intelligence can act as a threat for humanity and regarding how to improve ethical policies when pursuing technological advances. The current paper aims to answer contemporary challenges on how best to reduce risk from transhumanism or other elevating devices, and merges evolution theory with death and innovative technology.

The paper starts by explaining the presence of auto-catastrophic mechanisms in different levels of living entities, from the cellular level to humanity, planets, and galaxies. The same part relates survival with auto-catastrophic processes. The second section analyses the positives and negatives of auto-catastrophe and moves on to propose a model that links survival and auto-catastrophic mechanisms. The third part focuses on practical applications of the theory proposed here and suggests, among other recommendations, the implementation of self-destruction into advanced technological devices.

1 Synthesising auto-catastrophe

Auto-catastrophe or self-destruction is defined as any procedure of termination originating in a system and targeting the same system. It is important to note that self-destruction is a natural procedure existing in systems that can be characterised as alive or self-developing by their nature and that are not mechanical structures. A system could be cells, humans, Earth (and other planets), and galaxies. For the purpose of this paper, these systems can be labelled as '*alive systems*'. For example, self-destruction is the act of a person killing himself known as suicide and is also implemented at the cell level known as apoptosis. Its presence in society was also discussed by Koester (1967) and is known as the Medea hypothesis concerning Earth (Ward 2009) and as black holes for galaxies. These four examples are protogenic auto-catastrophic procedures because they have arisen from a system and are targeting the same system in order to terminate it. On the contrary, necrosis in cells, deadly accidents (e.g. by traffic injuries), or a meteor impact on Earth are not directly considered to be auto-catastrophic procedures because they are caused by elements outside the system, elements that the system cannot control. These could be described as deuterogenic auto-catastrophic procedures because they do not originate from the same system but have another origin which still contributes to the dissolution of the system. The different faces of self-destruction are discussed in this section to establish some foundations in order to highlight the possible importance of multivariate self-destruction to the reader.

1.1 Auto-catastrophe on a cellular level

Medical science today accepts apoptosis as a fundamental mechanism known as a form of programmed cell death (Engelberg-Kulka et al. 2006). Apoptosis is controlled by physiological, chemical, and genetic factors (Alberts et al. 2009), which means it is a characteristic of the normal functioning of living organisms and is determined by genes. Each day, 50–70 billion cells die in an average human adult due to apoptosis (Karam 2009). The standard numbers of apoptotic cells result in them having an essential role in development (e.g. processes that give rise to organs), morphogenesis (e.g. during embryonic development, the hands and legs are developed from apoptosis), normal cell turnover (the replacement of old cells with new ones), hormone-dependent organ atrophy (e.g. if a rat is given phenobarbital drugs as a treatment, the rat's liver would start growing, when the treatment stops, apoptosis of liver cells will gradually increase until the liver returns to its normal size), and the appropriate function of the immune system (Wyllie et al. 1980; Cohen 1991). However, when the standard number of apoptotic cells is reduced this may cause cancer and when the standard number of apoptotic cells increases this may cause atrophy (Alberts et al. 2009). Necrosis is another form of cell death caused by cell injury which is usually produced by factors external to the cell such as infections (Proskuryakov et al. 2003). Apoptosis and necrosis are two forms of cell destruction. Hence, apoptosis is a protogenic auto-catastrophic process and necrosis a deuterogenic auto-catastrophic process.

In humans, there are numerous auto-catastrophic processes such as suicide, self-immolation, death (as occurs with apoptosis in cells), and deadly violence as well as accidents and diseases (as with necrosis in cells).

1.2 Auto-catastrophe in the human species

Suicide is an intentional action by a person which leads to that person's death. Based on the World Health Organisation (WHO) database, deaths by suicide have increased 60 % worldwide in the last 45 years (Scott and Guo 2012). There are around 800,000 to a million deaths by suicide every year (Hawton and Heeringen 2009; Värnik 2012), which indicates that from 100,000 people, 16 of them are likely to die by suicide (WHO). Suicide is an attractive area of research among psychologists, anthropologists, and sociologists (Eliason 2009). There is a rich database on suicidal behaviour research which seems to correlate suicide with various elements such as mental disorders, e.g. depression (The National Confidential Inquiry into Suicide and Homicide by People with Mental Illness 2014), the geographic residence of a person (Singh and Siahpush 2002), cultural factors (Leong and Leach 2008; Leenaars 2008), the socio-economic status of a person (Lorant et al. 2005), and access to mental illness treatment (Caldwell et al. 2004).

Another aspect of suicide is self-immolation. Self-immolation is when a person sets himself on fire, and it is defined by Biggs (2005) as any intentional suicide '*on behalf of a collective cause*' (Biggs 2005, p. 174). Self-immolation accounts for about 1 % of all suicides in high-income countries such as Western Europe and the USA (Ahmadi 2007). Self-immolation usually characterises an act of protest (Biggs 2005). A study in Kermanshah, Iran, analysed the motives of 15 patients including 9 self-immolated patients. The outcomes suggested self-immolation is related to mental health problems, family problems, cultural context, self-immolation as a threat, and the distinct characteristics of the method (Rezaie et al. 2014). Both suicide and self-immolation are acts likely to lead to the death of the person; they fulfil the definition of self-destruction and, therefore, combine two forms of protogenic auto-catastrophic processes by a person to the same person.

Death has a complex definition with regard to brain death (Gervais 1989; Kellehear 2008). However, in this manuscript death is defined as the natural process of dying or being killed. Death is 'fundamentally' a biological phenomenon (Bernat 2004). As people die from many causes, there are a lot of ways of capturing death statistics. For example, mortality rate refers to deaths in general or due to a specific cause. Further examples are child mortality and infant mortality. Between First and Third World countries, causes of death vary greatly. For example, in 2002, based on the WHO database, the three main causes of death in low-income countries were: (a) coronary heart disease, (b) lower respiratory infections, and (c) HIV/AIDS, and in high-income countries: (a) coronary heart disease, (b) stroke and other cerebrovascular diseases, and (c) trachea, bronchus and lung cancers (WHO 2007). It is estimated that for about 150,000 people's deaths each year, 100,000 of them are due to age-related causes (Grey 2007). Causes of death could be physical diseases, psychological disorders, and accidents as well as violence. As accidents are less likely to be controlled by their sources (e.g. people) and targets (e.g. people), they are more likely to be defined as deuterogenic auto-catastrophic processes, whereas diseases to some extent are created by our own bodies due to internal factors such as genetic dysfunctions, anxiety, stress, or external factors such as bad habits or environmental influences (e.g. hunger), therefore, they can be defined equally as both protogenic and deuterogenic auto-catastrophic processes. Violence is a deuterogenic form of peoples' self-destruction arising from people and targeting people.

There are numerous types of violence such as self-abuse and suicide (which are protogenic types of self-destruction), and domestic violence and political violence (which are deuterogenic types of self-destruction). In 2010, all forms of violence resulted in about 1.3 million deaths (Lozano 2012), which is a figure similar to deaths from tuberculosis (1.34 million), higher than road traffic injuries deaths (1.21 million) and malaria deaths (830,000) (WHO 2008). There are lots of psychological, sociological (criminological), and biological theories on what causes different aspects of violence. An interesting approach to the topic was provided by Arthur Koestler in his book the '*The ghost in the machine*'. There is a tendency towards self-destruction arising both within peoples' brain structure and from external behaviours such as nuclear weapons (Koestler 1967). Koestler (1967) argued that humanity's atavistic brain areas will lead it to self-destruction, because they are responsible for emotional distress which could lead to violence and these attitudes are steadily increasing from generation to generation.

In addition to the examples of auto-catastrophic routes provided so far in cells, people, and humanity, there are symptoms of self-destruction occurring on Earth and in galaxies. As the definition of self-destruction provided here is '*any procedure of termination originating in a system and targeting the same system*' and a system was defined as '*alive or self-developing by its nature and are not mechanical structures*', we must have the courage to include Earth and galaxies in our definition of systems and make them accountable to Auto-Catastrophic Theory.

1.3 Auto-catastrophe on earth

It is supported by Peter Ward (2009) in his book, '*The Medea Hypothesis: Is Life on Earth Ultimately Self-Destructive?*' that Earth is perceived as a superorganism which is suicidal and its aim is its termination or it leads towards the microbial state in which it once existed. Ward (2009) describes all events of mass extinction (except from one which was the Cretaceous–Paleogene extinction event that was due to a meteor impact which is consider an external cause) as '*suicide attempts*' because they arise by Earth itself. These events include the methane poisoning (3.5 billion years ago), the oxygen catastrophe (2.7 billion years ago), the snowball earth (once 2.3 billion years ago and 760–639 million years ago), and a minimum of five putative hydrogen sulphide events. Ward (2009) moves on further by supporting the idea that the Medea hypothesis applies not only to our planet, but also to all life in the Universe. The Medea hypothesis is a theory supporting protogenic auto-catastrophic processes arising from Earth and targeting Earth.

1.4 Auto-catastrophe in galaxies

When it comes to the Universe or galaxies, the discussion of auto-catastrophic process becomes blurry, due to our current understanding of them. It is unclear how a black hole grows (Shankar 2009); therefore, it is not easy to argue whether they are included in their own self-destruction or the self-destruction of their source (e.g. a galaxy). Black holes are defined as a specimen of space time from which nothing including light can escape (Wald 1984); it is an empty space. However, black holes exist in almost all galaxies (Magorrian et al. 1998; Ferrarese and Merritt 2000), and their mass seems to be correlated with their host galaxies (Shankar 2009). There are many unknown areas surrounding galaxies and black holes; as a result, there is insufficient knowledge as to whether they fall into a process of auto-catastrophe just like cells, people, humanity, and Earth.

It seems that auto-catastrophe exists in various levels of our existence from the cell, to humans, the Earth, and most likely, our galaxy. Even if all systems seem to have a tendency of auto-catastrophic developments, there are also

antagonist procedures aiming to keep the system alive, improve it, and assist in its survival.

1.5 Survival

At the cell level, there are procedures aiming to protect cells, assist them to grow, and survive. Certainly, as people we are also characterised by our survival abilities and the same applies to all living creatures. Charles Darwin, in his book '*The Origin of Species*' first published in 1859, argues the development of life from non-life and that disadvantaged members of the same species (species are defined in the present paper as systems) would gradually via time disappear and the superior members of the same species would survive, leading towards a kind of perfectionism. Opponents of Darwin's evolution theory support the idea of Creationism (Ronald 2006), stating that life on earth is the result of a supernatural being. Both Darwin's theory and Creationism support the idea of constant improvement and survival. Another contribution to evolution theories is the opinion that technology shares a key part in peoples' survival. Some scholars move beyond the benefits of technology in evolution and hold the position that humanity has a responsibility to improve itself via technology (Walker 2002).

In addition to these, Earth also seems to have its own survival strategies. For example, the Gaia hypothesis proposed that different systems on Earth interact with each other and the inorganic compounds of Earth to form a self-regulating complex system which aims to assure life on Earth. Earth in the Gaia hypothesis is a complex system combined with the biosphere, atmosphere, hydrospheres and pedosphere (called Gaia) that seeks a stable chemical environment, which at the same time ensures not only the existence of Earth, but also life on it (Lovelock 2009). It may be that Earth was able to develop and evolve as it is today due to external factors such as Jupiter's gravity. Jupiter's gravity has an appreciable impact on Earth's 'survival' because it has strong gravity which catapults comets that might otherwise have hit Earth (Wetherill 1994).

Just like auto-catastrophic processes, some survival procedures are raised by the system itself (e.g. immune system) similar to protogenic auto-catastrophic processes; these are protogenic survival processes. Other survival procedures are derived from external factors (e.g. the contribution to Earth from Jupiter's gravity). These are in parallel with deuterogenic auto-catastrophic processes and can be described as deuterogenic survival processes. Advanced technology may become in a position to perform protogenic survival processes and progress itself. This idea was supported by Good (1965), who proposed the concept of '*intelligence explosion*' where machines would become capable of making themselves smarter. The '*intelligence explosion*' idea was developed into '*technological singularity*' by later authors (Vinge 1993). In the case of such a scenario, this act would be characterised as a protogenic survival process. However, advanced technology comes from a system that currently is not in agreement with the definition of '*alive systems*' proposed here. If ever advanced technology reached a status where it can perform protogenic survival processes, it would then fulfil the description of '*alive systems*'.

It seems that in different systems, there are multiple mechanisms (protogenic and deuterogenic) aiming to ensure the system continues self-development to achieve its survival and correspondingly there are two reflecting processes (protogenic and deuterogenic) targeting its auto-catastrophe that will lead to its termination. Puzzling questions that arise are: if a system is trying to survive why, at the same time, does the same system also target its dissolution? Why does auto-catastrophe exist? And, how are survival and auto-catastrophic processes combined to lead to the survival and termination of systems as well as the formation of new systems?

2 The survival of auto-catastrophe: a dualistic concept of its necessity

The thesis analysed in this section starts by elaborating on the dualistic consequences to a system of auto-catastrophe. One angle is that auto-catastrophe is an essential sub-component of survival. At the same time, from another angle, it acts as a terminator of a system resulting in the potential formation of entirely new systems. Indications are also shared in a potential modelling relationship between auto-catastrophe as a sub-component of survival and as a sub-component of termination. The second part argues on the existence of numerical correlations within and outside a system which control survival and auto-catastrophic processes. This part also expands on the dualistic concept of the necessity of auto-catastrophe.

2.1 First part: auto-catastrophe as a sub-component of termination and survival

If species like dinosaurs had not become extinct, we would probably not be here. If previous galaxies had not vanished, again, we would not exist. Auto-catastrophe's priority is pure extermination of a system. This extermination provides the opportunities for absolute new systems to emerge and evolve. Without auto-catastrophe, life today would not have occurred. To understand the importance of self-destruction, it is essential to visualise a system without it. A cell cannot contribute to its primary aim (e.g. developing

an organ) if it is not collaborating with other cells. If the number of average cells which must self-destruct via apoptosis decreases or increases, then the living organism may suffer serious dysfunction, e.g. Downs syndrome has an extra copy of chromosome 21 (Gordon et al. 2010). This leads us to a circa stable number of cells that self-destruct by both protogenic and deuterogenic processes in order for the system to survive. This is an indication of the need for survival and auto-catastrophic processes to jointly exist in equal numbers (between survival cells and apoptotic or necrotic cells) in order for a system to survive.

Moving into our area of interest, if the self-destruction attitudes did not exist in people this would lead to every person being healthy and living forever which could challenge humanity. It is the process of auto-catastrophe that contributes to the process of survival. If the weak species (or systems as defined here) did not self-destruct by protogenic or deuterogenic mechanics during evolution, as suggested by Darwin (1859), then the human race as it is today may not exist. Genetic mutations aid the survival of the best and the loss of the weak. Rephrasing this, protogenic and deuterogenic survival processes improve the chances of the survival of the best, and protogenic and deuterogenic auto-catastrophic processes assist the possibilities of losing the weak. There are no studies, to our knowledge, clarifying the numbers of species which were lost during auto-catastrophic processes.

When it was estimated that the global population has doubled in the last 45 years (Pimentel and Wilson 2004), death by suicide also increased by up to 60 % during the same duration of time (Scott and Guo 2012). The increase in the population is one clue to the increase in auto-catastrophic attitudes. This may be an indication of the analogous relationship between survival and auto-catastrophic processes. Further studies provide evidence that suicides increase during massive dysfunctions of society such as economic crisis and unemployment (Berk et al. 2006; Chalari 2014). Greece had the lowest rates of suicide in the EU, but the Greek government debt crisis, known as the Greek Depression, may be linked to an increase in suicides of up to 17 % between 2007 and 2009 (Hellenic Statistical Authority 2013). Knight (2012) supported the idea that suicide rates in Greece have grown during the crisis. These studies replicate the earlier paper of Durkheim (1951) which found that suicide rates evolve through phases of depression and weak social solidarity. On the same topic, suicide rates also increase with the increase in income inequality (De Vogli and Gimeno 2009). It seems that a dysfunctional system, such as a society in an economic crisis, leads to a change in the amount of self-destruction within the system (such as suicides) in order to assist the same system (e.g. the society). It seems that the number of self-destructive attitudes aims to assist the general good of a society. In the case of an economic crisis, self-destruction processes increase. The same system without an economic crisis would have fewer auto-catastrophic mechanisms. Therefore, there are clues to a decrease in self-destruction when society needs people. The next part analyses these relationships further.

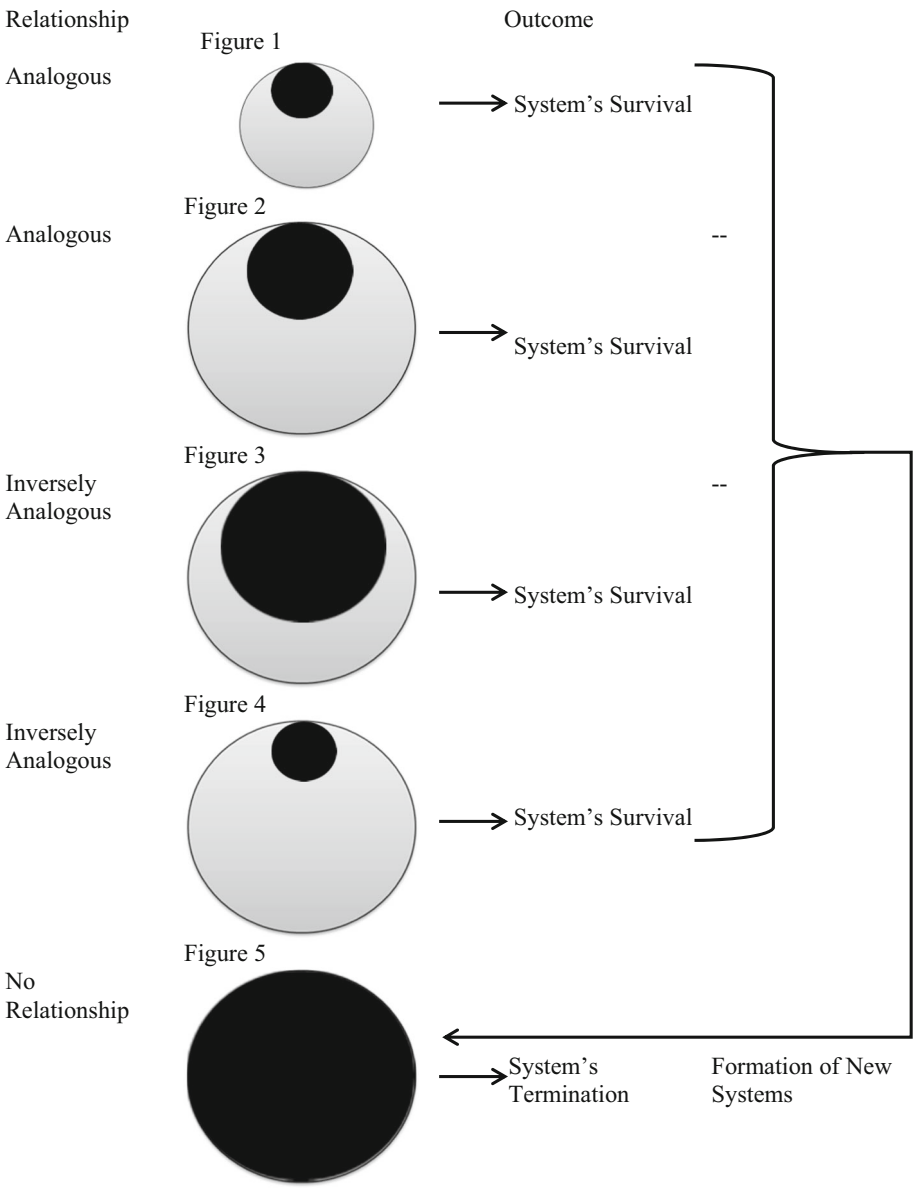
2.2 Second part: self-destruction mathematical modelling

This section is built on the hypothesis that auto-catastrophe is animated and is moving upwards and downwards as a sub-component of survival to protect a system. As a sub-component of termination, it reaches its highest level purely to eliminate the system. Prior to any discussion, it is important to clarify that a system can be at the same time a whole system and a sub-system of a whole system, depending on the content in which it is framed. It is hypothesised that there are three relationships between systems and within systems that serve the dualistic effects of auto-catastrophe. These are: (a) analogous, (b) inversely analogous, and (c) no relationship. Table 1 presents these three relationships. The black circles on the figures represent systems that have been self-destructed. The grey circles are systems within survival processes.

Starting from self-destruction as a sub-component of survival, for the appropriate function of a system, auto-catastrophic procedures should remain on a stable level within the system (figure 1 on Table 1). Instability of this function may lead to the absolute termination of the system. When a system grows, auto-catastrophic mechanics would also automatically increase in an effort to sustain the stability between survival and auto-catastrophe, which leads us to an analogous relationship (figure 2 on Table 1). However, when the system dysfunctions and its recovery require fewer systems within it self-destruction increases (figure 3 on Table 1). Correspondingly, when the system dysfunctions and its recovery require more systems within it self-destruction decreases (figure 4 on Table 1). In all these scenarios, we have a ‘healthy’ system where self-destruction processes decrease or increase slightly accordingly in order to help the system survive. In Table 1, each tiny dot that contributes to the colour grey is a system (sub-systems), similarly each tiny dot adding to form the colour black also combines a system (sub-systems). The large black circle on the figure is a system (whole systems) as are the large grey circles (whole systems). From this perspective, the diagram illustrates auto-catastrophe both within and outside a system.

When self-destruction acts as a sub-component of a terminator, self-destruction reaches the highest possible level in order to overcome the survival processes of the

Table 1 Images of auto-catastrophe in four different scenarios



system and end it (figure 5 on Table 1). In this case, there is no relationship as survival processes no longer exist. The direction of the arrows on Table 1 illustrates that every system would end up with figure 5, which is its closure. Auto-catastrophe may be reflected as essential for the survival of a system on a temporary basis, but its permanent main obligation is to terminate the system.

The termination of a system and the creation of new ones could be a loyalty target of auto-catastrophic processes that is deeply embedded into a system. Auto-catastrophe is part of a system in order to become able to destroy it (otherwise it would not be defined as auto-catastrophe).

It is difficult to define whether auto-catastrophe is good or bad for humanity. It could be good because auto-catastrophe could have been the reason why earlier species were exterminated which has helped our development. It could be bad, because auto-catastrophe is likely to end humanity.

In a paradoxical way, auto-catastrophe is assisting survival by aiding the survival of a system (or species), by assisting the improvement (or evolution) of old systems and by allowing the formation of new systems. Survival processes would have been meaningless without the company of auto-catastrophic processes. However, auto-catastrophe is only acting as a sub-component of survival on a

temporary basis. When a system is characterised as '*alive or self-developing by its nature*', it would automatically be accompanied by auto-catastrophic mechanics, implemented within it. If the theory presented in this paper contains an element of truth, then how can this knowledge help us?

3 Implications of self-destruction for contemporary technological systems

The proposed theory helps us to perceive that the key for the human race to overcome auto-catastrophic processes lies in handling protogenic and deuterogenic survival processes as well as auto-catastrophic processes via '*alive*', partially '*alive*', or non-'*alive*' systems. Systems that are '*alive or self-developing*' are vulnerable to auto-catastrophic processes. Systems moderately vulnerable to auto-catastrophic processes are systems such as advanced technology which is characterised by artificial intelligence. Energy is the only 'system' not exposed at all to auto-catastrophic processes.

Three implications are offered by the proposed theory. First, prepare for the end by storing humanity's history in artificially intelligent devices likely to overcome protogenic auto-catastrophic processes. Second, overcome the end by using advanced technology to assist humans to increase deuterogenic survival processes and change our system from 'alive' into a partially 'alive' system. Third, redefine artificial intelligence as a deuterogenic auto-catastrophic threat to humanity and programmed protogenic auto-catastrophic processes into artificial intelligences devices.

3.1 Preparing for the end

People and Earth are systems that would be terminated by protogenic and deuterogenic auto-catastrophic processes. It is suggested to use advanced technological devices with artificial intelligence features (which are considered to be partially 'alive' systems) to store our history. Despite the fact that such devices are susceptible to deuterogenic auto-catastrophic processes, such as materials decomposition, they can deceive auto-catastrophic mechanisms far longer than people, because they are not exposed to protogenic auto-catastrophic processes. This should be an effort to indirectly save humanity, because if humanity ends without any trace, it would be like it never existed at all.

3.2 Overcoming the end by increasing deuterogenic survival processes and 'dehumanisation'

The proposed theory suggests using advanced technology to increase peoples' deuterogenic survival processes and turn people into partially 'alive' systems which are not exposed to protogenic auto-catastrophic processes. These are old ideologies which the paper presents from a different viewpoint. The paper contributes to linking these advanced technologies with survival and catastrophic processes and provides justifications as to why 'dehumanisation' is a necessity to achieve the overcoming of auto-catastrophic processes. This original way of presenting technological systems that can help life extension, such as H+ or transhumanism, cryonic suspension, and nanotechnology will assist by approaching this ideology from a new different angle.

Extending human life via H+, cryonic suspension, and nanotechnology is not identical to immortality, but is a step in the right direction of overcoming auto-catastrophic processes. Huxley (1927) supported that technology would be able to change virtually all people into a generation of new people who would be in much better condition than the previous one. This new generation would still be included in the human race, but it would be considered to enjoy a much better quality of life. Huxley's (1927) understanding of transhumanism is generally referred to as transformation leading towards positive outcomes. A plethora of researchers supported Huxley's (1927) vision, and subsequent debates on transhumanism developed. One example is the recent clarifications that FM-2030 (1989) provided on the term—that this transformation includes the medical advances given today such as plastic surgery and telecommunications. The term transhumanism is further argued as a stable evolution of intelligence (More 1990), of culture, physical, and mental capabilities (Various 2003). Extending human life span via technology with a focus on medical science was also proposed by Condorcet (1979) who explains that people are unlikely to become immortal but are much more likely to be able to extend their lifespan. Also, in '*The Prospects of Immortality*' (Ettinger 1964) cryonic suspension is recommended as it may help further life extension. Drexler and Smalley (1993) argue that molecular nanotechnology is the key equipment to bypass diseases and ageing. Another interesting idea suggests literally handing over people to computers. This was proposed by Bostrom (2003) who suggested that a human mind can be uploaded to a computer or a transhumanist. The Transhumanism Declaration of 2009 also supports that overcoming ageing is a possibility via advanced technology.

None of this literature was able to justify clearly any background theories of why people need to be transformed into new systems, especially systems that are not considered '*alive*' systems, in order to survive longer or become immortal. The proposed Auto-Catastrophic Theory justifies why such transformation is necessary. Auto-Catastrophic Theory re-determines these approaches (e.g.

cryonic suspension) as deuterogenic survival processes that can overcome protogenic auto-catastrophic processes for people. Another contribution of the paper is the explanation of why 'dehumanisation' is the basis to overcome the auto-catastrophic process. Systems that are defined as '*alive*' (like people) are increasingly vulnerable to protogenic auto-catastrophic processes. So, to fully overcome protogenic auto-catastrophic processes we need to turn the human race into partially 'alive' systems which are less exposed to protogenic auto-catastrophic processes.

3.3 Overcoming the end by decreasing deuterogenic auto-catastrophic processes

In consideration of Auto-Catastrophic Theory, there are clarifications of systems into 'alive' and not 'alive' as well as the consequences of such features into protogenic and deuterogenic survival or auto-catastrophic processes. Two further contributions are: (a) providing a new reason why advanced technology characterised by artificial intelligence is a threat to people because it does not succumb to protogenic auto-catastrophic processes and (b) suggesting an additional measure, along with previous suggestions such as legislation or Friendly AI, to reduce any threats from artificial intelligence by programming protogenic auto-catastrophic processes into them.

It was repeatedly argued that artificial intelligence can be a threat to the human race, but the justification of this from the perspective that artificial intelligence systems are not vulnerable to protogenic auto-catastrophic processes was not elaborated in the past. Technology is developed by humans, and if necessary, measures are not taken it could turn against humanity, acting as a deuterogenic auto-catastrophic process. The term 'robot', which represents one of today's faces of advanced technology, was introduced in Karel Capek's play R.U.R back in 1921 where the robot assistant ultimately killed its creators (Capek 2004). Similarly, Mary Shelley's Frankenstein (1818), which can be considered analogous with H+, also turns against its creator.

Are roboticists, ignoring auto-catastrophe's contributions to survival, acting wrongly? When it comes to artificial intelligence robots, things change because they partly satisfy the definition of a system; therefore, we should consider implanting self-destruction attitudes into them. The previous definition of systems was being '*alive or self-developing by its nature and are not mechanical structures*'. Artificial intelligence machines may partially fulfil the definition of a system which is 'self-developing', but they differ as a system because they are not alive or self-developing 'by its nature', and in opposition to the definition, they are mechanical structures. As artificial intelligence is partially vulnerable to auto-catastrophic processes, it is also vulnerable to protogenic survival processes. This infers that machines would be able to 'learn' algorithms (Russell and Peter 2010). Moore's (1965) research suggests that computing power doubles every 18 months to 2 years. Are there any possibilities for these artificial intelligence machines to learn how to survive in different circumstances? In such cases, without the process of auto-catastrophe implemented within them, could this lead to our self-destruction by our creation? In 1965, scholars hypothesised that machines would reach a point where they could develop better machines than humans can produce (Good 1965) and this invention may be the last a man would have invented (Good 1965). Paraphrasing Good (1965), he assumes that this ultra-intelligent machine would act as a deuterogenic auto-catastrophic mechanism for humans. Vinge (1993) also acknowledged the threats to humanity by advanced technology in his paper 'Technological Singularity', where he also reasons that the human era may end following the development of a superhuman intelligence technology. Alan Turing also predicted that machines would overpass human intelligence (1950), as did Marvin Minsky (1994), Ray Kurzweil (1999), and Nick Bostrom (1998, 2002). It should be taken into consideration whether it would be useful and safe for our existence to develop intelligent machines or advanced technology that self-destroys.

Earlier suggestions of how to handle any potential threats from artificial intelligence did not refer to implementing 'death' to such systems. Auto-Catastrophic Theory implies that auto-catastrophic mechanisms are as important as survival mechanisms for human safety from systems that are partially characterised as '*alive systems*'. Founding bodies, universities, and factories may not find the latest suggestion attractive, but they should be considering investment in its implementation. The risk from advanced technology was also discussed by Bostrom (2002), who created a catalogue of technological advances that can be a risk for humanity. On his list, nanotechnology and superintelligence are the riskiest technological advances to humanity. Joy (2000) also supported these views, considering nanotechnology and genetics as dangerous for the human race. Fukuyama (2004) characterised transhumanism as the most dangerous ideology for humanity. A few suggestions on how to handle this threat come from Annas et al. (2002), who proposed legislation to make genetic modification a crime against humanity. Yudkowsky (2008) suggested the development of Friendly AI. The paper adds to these suggestions by arguing that the development of AI should be programmed to self-destroy in a process similar to death in '*alive systems*'.

4 Conclusions

Auto-Catastrophic Theory proposes that self-destruction mechanisms, which are also defined as auto-catastrophic procedures, are '*a natural procedure existing in systems that can be characterised as alive or self-developing by its nature and that are not mechanical structures*'. Auto-catastrophe is implemented in living systems and exists within cells, people, societies, Earth, and galaxies. Without auto-catastrophe, humanity may not have existed, or may not have been able to function, or an organism may not have been able to live. Auto-catastrophe's manifestation will terminate living systems.

Self-destruction goes beyond the development of a system; it contributes to the development of entirely new systems. This makes auto-catastrophe both a positive and a negative mechanism. However, self-destruction is highly related with the needs of the system to survive and to the 'need' of the system to end.

Three main implications from Auto-Catastrophic Theory are:

- Acceptance that people and Earth as 'alive' systems would be terminated, so non-'alive' systems (e.g. artificially intelligent devices) should be used to save humanity's history.
- Non-'alive' systems (e.g. nanotechnology) can be used to increase deuterogenic survival processes for people (e.g. life extension) and to turn people into partially non-'alive' systems (e.g. H^{+}) to overwhelm protogenic auto-catastrophic processes (e.g. death).
- Non-'alive' systems can be a threat to humanity when they are considered to be partially 'alive' systems (e.g. artificial intelligence) and they can also conduct protogenic survival processes, because they are not vulnerable to protogenic auto-catastrophic processes but only to deuterogenic auto-catastrophic processes.
    - Defending humanity from such deuterogenic auto-catastrophic processes by programming protogenic auto-catastrophic processes into them.

The more we turn to artificial intelligence to help our survival, the greater is the threat (by artificial intelligence) of our extinction. This is because, first, artificially established devices will develop protogenic survival processes turning them into a potential threat for us (as a deuterogenic auto-catastrophic process). Second, the more we try to overcome protogenic auto-catastrophic processes (e.g. death), the less 'humans' we become (so we can achieve partially 'alive' systems that are not vulnerable to auto-catastrophe). The paper does not aim to offer a solution to such dilemmas, but reveal them to scholars and practitioners for further consideration.

Auto-Catastrophic Theory is a different angle of Darwin's theory of evolution. Both evolution theory and Auto-Catastrophic Theory aim for the survival of a system, but they are not the same; in opposition to evolution theory, which allows the stronger to survive (just as our theory proposes that self-destruction can assist with this) and leads towards development, Auto-Catastrophic Theory leads towards the end.

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