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Mathematical Exploration of AI's Harmfulness

Sahar Boroomand*, Mohsen Jaafarnia, Xiehua Li, Duan Dai

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Abstract

Effort of current AIs (artificial intelligence) researchers mostly focuses on capable AIs, which mainly promote benefits of AI for the society, considering that it is a social challenge because it seeks to motivate AI developers to design AIs with less level of Autos in (automation errors). The Auto sins of AIs are controllable by man despite the high level of AI, whereas, uncontrolled auto sins of AIs certainly could be harm to human society. Hence, the serious question emerge here is "Which level of AIs can be out of control and harmful for humanity?" This research has concentrated on this question to identify appropriate answer. The aim of this research is to represent the reality of these Auto sins and its danger in higher levels of AI (A (8) level of automation). In order to understand this phenomenon, this research tries to prove the issue through one concise overview and a mathematical argument which supports our findings about futuristic AI and her faults. Results show that the equation greater than zero means the enforcement cost increases with the increased level of reaction against intelligent product and in case the equation is less than zero the situation turns to other side. Future research must consider the interaction and participation of humans in defining the harmfulness.

Keywords: Artificial Intelligence, Intelligent Product, Automation, Faults Of Artificial Intelligence

Introduction

With the advantages of the technological advancements the negative aspects are complimentary as these have been viewed taking place with the high level of technology. Because of the technological developments mankind has been put on the verge of destruction that would take place in the near future. Through the gradual progress in these issues the awareness regarding the global calamitous have been risen. This general awareness has found to be taken the central position in the fields of human evolution, global nuclear war, artificial intelligence, geochemistry, astrophysics, global warming, nanotechnology and molecular biology.

The point of concentration in this study is on artificial intelligence (AI) as one of the probable reason of catastrophes; since, faults of AI have been bolded as it creates a lot of issues that man is facing in near future of automation. Mainly to know, how Man should cooperate with them in case they have mistaken although we know intelligent products/services brings many benefits for us. This issue opens a view about fault of intelligent products/services; about the level of intelligent products/services that could be harmful, as smartness has different levels.

Researchers have argued that scientific evidences represent that, inactive and indolent/disable human being in order to sustain has been toolmaker creature which until now they have been used as automation (which is an exchange of mental and physical ability in product/services) in a wide range of product/service design, that would resolve his needs and overcome his inabilities and indolent in the last millions of years. According to research the process of automation can be explained as the steps involved in operations of a product or service through which a process can be completed without any kind of human help or intervention. This automation has to be achieved through indulging a variety of program designs and instructions that would be executed by the machines for the purpose of performing a certain operation or action (Maslow, 1943; Amber and Amber, 1962).

In fact, before launching any new technology using in higher levels of automation, the field has always been set to make the potential benefits of this automation popular that would make tasks easier and release users from tasks. But, beside those benefits we are facing a

Sahar Boroomand*, Duan Dai
School of Art and Architecture, Central South University, Changsha, China

Mohsen Jaafarnia
School of Design, Hunan University, Changsha, China

Xiehua Li
College of Computer Science and Electronic Engineering, Hunan University, China

***Email:** saharboroomand@csu.edu.cn

dangerous issue too that may also make serious problem for users through their errors as high level automation technology becomes the source of advantages as well as disadvantages equally. Researchers have argued the impact of these advantages and disadvantages on the human life are linked to the extent to which these are relevant with the product or design of the artificial intelligence. However, early predictions in AI are still far from being able to know about the possible fault of product/service and her way to control. In this way, controlling errors could be easier in levels A(1) to A (7) as the level of intelligence is lower than human brain power; but this cannot be the same in high intelligent level such as A(8) which may create irrecoverable problem. But because of the nature of being intelligent in new product/service, the current product or machine innovation have been linked to it with the ability of influencing the everyday human life, we need to answer an important question as soon as posible that, whether every kind of AI is useful? If not which level of intelligence can be dangerous? In the scenario that high intelligent AIs and humans live together; the quality of their interaction is very important. According to research until today Humans as highest intelligent creature have had control on all kinds of products; but in the coming future if AIs which their intelligence is equal to human intelligence, try to take control over the humans and harm them, as product would not be called sustainable product and would be very dangerous to society.

Based on research though the level of automation is developing and the high level artificial intelligence is embedded in machines yet, these create the issues for the humans in the daily life use because of which almost every field of human life is disturbed therefore, in this research the harmfulness of the artificial intelligence are going to be discussed. In the previous researches the changing nature of the artificial intelligence and the potential harms of it has been the point of central consideration that helped in the current research to the significant level. However, the mathematical exploration of harmfulness of faults of the artificial intelligence has been a neglected point that is going to be covered in the current research.

The research regarding the harmfulness of artificial intelligence and the use of mathematics to explore these issues will have a greater level of significance for the humans as through this the faults will be evident and the proper procedure in form of mathematics will help the field of science through which not only the product but also the designer as well as the user will get benefit.

This paper is concerned with the mistake of high level AI technology when products/services do wrong; we try to overcome the possibility of fault of intelligent automation levels; to put the spotlight on faults of AI in level A (8), which will be a challenging one; to look at some of the major issues under discussion reflecting the irrecoverable nature of the problems. All this has to be done through the mathematical exploration of the harmfulness caused from the artificial intelligence therefore, the research carries the objective:

- To analyze the issues of harmfulness of artificial intelligence through the mathematical exploration.

Therefore, it can be reliable to close our eyes on all kinds of intelligent products/services, because every kind of AI is not useful for man. In this paper, we have definition of automation levels first to present A (6) and A (7) are also AI but not that much harmful than A (8). Since they are under man's control and man has capability of being creative which A (6) and A(7) do not have; they will be the part which optimistic people always talk that AI has benefit for human being. Actually they are right, A (6) and A (7) could be very helpful for man if we program them for good purposes. For instance, in recent times a huge number of faults have been seen under the broad using of intelligent products by US which resulted in killing many innocent people in Africa, Yemen, Syria, Iraq, Afghanistan and Pakistan. "*No doubt US drone strikes killed civilians*" Obama says (Riechmann, 2017; RT TV, 2016).

Therefore, first we start talking about the reason we use automation, and then introduce the levels of automation; after that through one mathematical argument, we discuss about errors of A (8) and its harmfulness, then conclude the research.

The structure of this research includes the discussion regarding the need for automation that lead to the use of artificial intelligence. Afterwards, the level of automation, problems in the artificial intelligence and the analysis of the issues has been conducted followed by the analysis and discussion regarding the faults found in the artificial intelligence. The research structure includes the conclusive remarks about the study.

Literature Review

Why we need automation

Interesting as it sounds, human beings have a lot of limited abilities compared to animals; that we are unable to hang upside down with our legs like a bat, or swim the way goose can, with its webbed feet, we cannot tear apart anything like the tiger can with its paws, or have long sighted powers like those of eagles. We neither have strong beak like that of a woodpecker nor do we have shark's teeth or a dog's flair, all of which makes a man look like the bearer of manifold shortcomings. Based on research, because of many disabilities human has tried to find alternatives by putting automation levels on products/services knowing clearly that the levels of automation are

suitable for a product/service to solve user's need which have evolved out from disability and laziness in daily activities. As Marx mentioned human being is needy creature, who puts tasks and responsibility on product/service; for instance human can practice to get the skill of drawing straight line just by hand, which needs to spend a lot of energy and time to get the skill; but instead we make ruler with A (2) level of automation to draw line, then everyone can draw a straight line on a paper without having the skill and even with close eyes. According to studies these needs are in direct retaliation with automation (Goble, 1980).

On the other side, the researchers have also reported one factor along with the discussed above is the shortage of time and the need to do a lot of work in a shorter period of time. Therefore, the automation has been suggested as the important tool or the procedure to work that can make the user avail as lot of benefits of working within a shorter span of time. Additionally, the full of activity life of humans has made it impossible to wait for a work to be done by taking a length of time because of which the automation is used. Also, the automation has been reported to be used not only in one area of human life but in every field of life that makes imperative the use of automation. Medical fields have shown a greater level of development in the recent year and the number of cures in limited time has been increased significantly (Maslow, 1943; Amber and Amber, 1962).

In the Maslow's hierarchy it has greatly been depicted that the actions of humans are always backed by the motivations that come form needs. Based on the hierarchy of need provided by Maslow (1943) there are several level o the needs and almost at every step of the need the humans and the society on larger requires some level of automations. We have some basic kinds of needs that keeps and inborn place in human life that has been viewed s evolving over the millions of past years. It comes out from deficiencies because a necessity creates a clear negative outcome that can be physical, like inability to lift a weight with our arms, or it could be either mental or psychological, like the inability to lift a weight as thought of already in the mind even though the arms are able to do so. Based on research this kind of need has a psychological feature that arouses a user to act towards a goal that can always give direction to user's behavior (Westen and et al, 2002).

Fig. 1. Human disability and laziness.

Karl Marx mentioned humans have experienced pain during learning and working. Therefore, human and animals cannot be the same in terms of needs because of their vital activity. Human designs tools/systems to make other products/services for his satisfaction, it makes a human being an intelligent creature that develops his needs and abilities. This explanation put finger on automation that why we need it. Although it has disadvantages:

1. The basic kind of disadvantage has been linked with the abilities and the skills of the user as through automation all the works are automatically done with the assistance of the artificial intelligence that becomes the reason of skill and abilities deterioration in the user. Through extensive use of automation the user gets no chance of implementing the abilities and polishing the skills. The artificial intelligence or the automation possess the abilities of performing the tasks based on the programs installed in it but some of the situations call for unique type of solutions that could be provided by the human mind only. Using the less skills causes deterioration in these skills that, in future, becomes nearly impossible to be recovered.
2. Following automation what we can see is vigilance failure, user fatigue and boredom, which could lead to probable decline of safety and performance.
3. Designer's errors are sometimes the source of product/service accidents.
4. Automation might at times result in misuse, abuse or disuse.
5. Loss of job opportunities (Crowe, 2016).

Levels of Automation

Hence summing up all this, we can give a brief overview of automation. But at the beginning we should know, we have automation almost in everything, even Kit-Kat has A (2) level of Automation between furrows of chocolate. This furrows acts with thin section line to make user skilled in breaking the bar from lines without any clumsy falls.

According to research in some traffic instances it has been found that some traffic signals work automatically without any of the operator with the responsibility to direct each traffic side for the purpose of changing the driving style upon blowing different colors of lights. Referring to this, Parasuraman says that automation is "*the full or partial replacement of a function previously carried out by the human operator*" (Parasuraman and et al, 1996) and these kinds of products/services are based on the following principles:

1. Placing the automation in product/service design in order to overcome the lethargic nature of human beings: Hence products/services were always designed by designers to manifest the duty of the user on the product/service. For example, earlier people used to wash clothes with their own hands but eventually they invented the washing machine (in product design) or the public service job of washing (in service design), which washes clothes very diligently.
2. Placing the automation in product/service design because of human incapability: As discussed here, most human limbs (except the brain) fall short of certain special abilities unlike those of animals. Hence, here the designer has to make up in the product/service for these inadequacies and give more strength to the users. For instance, Man can fly by airplane (in product design) or the elderly care service during the boarding in the flight (in service design).

Automation has certain advantages which are given below: (Power and Sharda, 2009)

1. Automatic products/services can be used to perform physical and mental works, which are strenuous for humans.
2. Automatic products/services can be used to perform monotonous work of humans.
3. Automatic products/services can be used to perform dangerous tasks like defusing bomb, firefighting, working in space, underwater and in extreme weather conditions, etc.
4. Doing work, this is beyond human capabilities of size, weight, speed, endurance, etc.

Based on research it should be noted that currently automation of products/services can be found in 8 levels today and use them in a product/service design by designers, as levels A(0), A(1), A(2) … & A(7). But there is one more level which is A(8) and still man could not deliver it, but we can see it just in science fiction media. And these 9 levels are as follow : (Bedworth and et al, 1991; Bollinger and Duffie, 1981; Boothroyd and et al, 1982; Chang and Melkanoff 1989; Childs. 1982*;* Garratt. 1991; Groover, 2014; Kalpakjian and Schmid, 2009)

A (0) level of automation: Human ability replaced in a product/service can be Zero.
Here, work becomes easy without any help of product/service; it means that user does the work with his own body parts or mind, without any help of any external factor; for example, switching on the computer by pressing the button with finger; or lifting any load by hand only (Westen and et al, 2002).

Fig. 2. Lifting A(0), Watch A(1) & Kit-Kat A(2).

A (1) level of automation: Human ability is replaced in the product/service through Energy.
This level of automation reduces the consumption of energy required for the user's activity. In A (1) level of automation every product/service uses energy to perform instead of user. For instance, automatic watch has a self-winding watch, whose mainspring is automatic by the natural motion of the wearer's arm. Here the A (1) of the watch has a semicircular rotor (kind of unconventional weight) that frequently changes its axis. Based on the literature the regular postures of the wrist turn the rotor for the purpose of turning the back-and-forth on its staff that has been linked to the mainspring (Westen and et al, 2002).

A (2) level of automation: Human ability is replaced in the product/service through Skill.
Skill is defined as 'clever, masterful and dexterity involved in working'. Also skills have been defined as the ability or skill involved in delivery of exact work using minimum time and energy consumption. Human receive skills through continuous training and education which is always dependent on many variables. But through the product/service A (2) level of automation resolves the need of training

and practice required for displaying efficiency in work. Based on research two examples could be ruler and Kit-Kat (Westen and et al, 2002; DeGarmo and et al, 2002).

A (3) level of automation: Human ability is replaced in the product/service through Perseverance. Perseverance means persistence to follow and repeat tasks with tenacity. This repetition of work requires perseverance and sometimes to perform a simple task a person requires skills while spending considerable amount of time and energy. Repetition of a simple task in the long turn is not possible, this persuades designer to put A (3) automations level indulged in the product or service keeps the humans from doing the repetitive tasks as these are done by the automation itself. As an example, we can mention pen which continually user can write (Westen and et al, 2002; DeGarmo and et al, 2002).

Fig. 3. Pen A (3), & Tap A (4).

A (4) level of automation: Human ability is replaced in the product/service through Judgement.
Judgment is an activity which human always undertake to compare with a source, sample or rule which is a reference. During the course of the judgment, all inputs are checked to ensure if they could be related to the reference, however this has deemed as the crucial task, which demands energy, time and skill to do the repetitive work. But through automation the product/service checks the inputs and reference, and decides to accept or reject the inputs based on acceptable similarities and differences between them. Sensor tap can be a good example; The Tap can control user's water consumption through A (4) level of automation. The sensor tap functions the way that the user put hands under the tap and the sensor after sensing something under it dispense the water right away. This prevents water wastage and conserves it. Previously, with the use of traditional taps the water wastage was about 50 % to 80 % that has been decreased significantly through sensor taps while washing the hands (Westen and et al, 2002; DeGarmo and et al, 2002).

A (5) level of automation: Human ability is replaced in the product/service through Evaluation.
Evaluation is an activity that requires comparing, judging and ranking factors on the basis of priority before taking any decision. Evaluation in tasks is not easy, since it requires too much accuracy, continuous effort, time, knowledge, skill and energy. Then, man tries to evaluate through automatic product/service for judging inputs, to take out suitable results from them and using those results for controlling the inputs and outputs. This is specially exercised when the number of parameters become more than two. In this evaluation, the product/service requires processor (computer). Based on research performance into the computer will happen through solving the mathematical equations that describes how this behavior and its process is bounded [19]. For example, we can mention the Vending machines; it is a product from which people can buy anything like ice cream, shoes, fruit juice, stockings, etc. According to studies this product can evaluate amount and originality of user's money, select the product accordingly and eventually sell the product through A (5) level of automation (DeGarmo and et al, 2002).

A (6) level of automation: Human ability is replaced in the product/service through Learning.
Ability of storing the information of self/other experience result in the brain of living creatures like human is called learning. Man needs to have the ability of learning to be able to use in future tasks. So, since continuously learning is difficult for humans, he tries to manifest this task in product/service with A (6) level of automation. She has expert programs. It means the product/service uses software (with the deductive decision-making capability of the human brain) which evaluates the tasks and stores their results as experiences to be used in the consecutive time. This ability put in product/service is termed as intelligent program. Researchers have pointed that puppy robot can be a good example, which can learn skills and tricks recognize faces, voices, and color (DeGarmo and et al, 2002). For instance, Robots designed to learn and adapt to her environment, based on ability of learning.

A (7) level of automation: Human ability is replaced in the product/service through Argument.
Since inception humans have always been inquisitive about the immediate environment in order to make life easier. This in turn made them resort to the ability of arguing or reasoning. In terms of logic, argument is using clear cause to discover the unclear cause. Researchers have pointed while this activity is not quite easy for human beings, human tend to entrust product/service with ability of argument through using A (7) level of automation which is based on vertical thinking and involves the task of finding out the idea using primary data (which has learned through the past experiences) (DeGarmo and et al, 2002).

For instance, we can mention Siri on the iPhone; she is an intelligent product of apple which can talk to users and the voice-activated AI software of this product features so heavily in the promotion of her iPhone. For example, if the user asks a question verbally that "Is it going to rain tomorrow?" iPhone tells and write: "Let me think about it." And after 2 second iPhone shows a list of weather and tells: "Looking at the London weather." It means based on argument, the iPhone understood what the user was asking about, she find the present location of the user without enquiring that which city he was referring to and hence continues to reply, "it does not look like it is going to rain tomorrow". Alan Turing (Turing, 1950) has written an article on this issue that how to understand the product has AI capability (Later known as the Turing test). In this article, he proposed a method for identifying intelligence, which is more like a game. Suppose you are in one side of a wall and you have connection with another side just with a teletype. A person has a connection with you through that and a conversation between you and the person would eventually take place across the wall. Now if after this conversation, someone tells you that no one was behind the wall and she was just a machine which was answering you, then she will be an intelligent machine, otherwise if you understand that the answers are artificial and abnormal in between the conversation, the machine is not intelligent then it will not pass the exam of Turing.

A (8) level of automation: Human ability is replaced in the product/service through Creativity.
Since time immemorial, man has always been seen to be actively involved in creative pursuits. Through creativity, initiation, invention, innovation and discovery human beings are essentially proved to be intelligent and all of these traits are the output of his thinking and ideas. Therefore 'creativity' is the vital factor that sets him apart from other living creatures. However, he tries to manifest his creativity into products and this is where AI is evolving to be thinker and creative like human; although the idea is probably complicated and with the currently available technology is a distant dream, since it is based on horizontal thinking the process does not have any relation to primary data (past experiences) (Author, 2005). This elite thinking creates unlimited creativity and is not based on logic, therefore it does not have boundaries and it is the dominance of elite that helps in creative thinking. Researchers have pointed human intelligence is much more complex than computer systems with outstanding abilities like reasoning, behaviorism, comparison, application of creative concepts and capabilities which AI would probably incorporate after a period of time (Bucklin and et al, 1998; Stark, 1989).

We still do not have a product with these abilities, however the movie of '2001: A Space Odyssey' is a good case to show what exactly it is. The movie was released in year 1968 with the topic of exploring the elements of human evolution. With this topic the movie also depicted the issues regarding the artificial intelligence, technology as well as the outer space life. Many authors have written the comments on the topics discussed in the movie issue (Agel, 1970; Bizony, 2001; Castle, 2016; Chion, 2008; Ciment and *Kubrick*, 1980; Clarke, 1972, Hughes, 2001; (Kolker, 2006; Schwam, 2000; Wheat, 2000). One prominent and noteworthy feature of the film has been related to the realism, special effects and artificial intelligence which can explain A (8) level of automation properly.

Problematic Sins

According to literature human from automation has got benefit in resolving the needs and initially when man found automation, from the beginning he had to overcome the errors in elaborating on this area too. It is always relevant to make a mention of the point that having errors are common in product/service design since we evolve the design with its errors and weakness when products/services change the shape while day by day we redesign them. He tried to decrease the mistakes of the levels of automation but he observed that only improving the levels of automation cannot resolve the problem of errors and when he uses higher levels of automaton to control the lower levels mistakes, again new mistakes of high level appears with their own complexity and characteristics. Since mistake of each level has its own nature therefore reacting against the mistakes must be thoughtfulness. The review of the automation here authenticates on the fact that the automation of product has evolved in two stages up till now. The nature of errors in these two steps is totally different with errors of futuristic A(8) step; which all together can be elaborated as follow:

1. Using A(0) to A(5) level of automation in which man controls the products.
2. Using A(6)& A(7) in which man controls the product and the product controls man altogether.
3. Step of using A (8) level of automation in which the product controls man.

Many questions arise about the possible dangerous error of AI in higher Levels of Automation. Why the higher level Automation with AI attempted to error? And how products can turn out to be an enemy for human? How comfortable are we to put our lives in the hands of products? How much computer can be close and similar to humans? How closely the computer is able to emulate human species? What ethical and philosophical questions are raised when we talk about the domain of intelligent products? How can we ensure products with AI capability behave ethically or are they used ethically? And the main research question of this paper is-'which level of AI can be harmful for man?' since computer has attained the level of consciousness of A(8) and for unknown reasons become a murderer. But why? One could argue that because AI in A(8) level of automation is programmed to mimic mankind, she attained man's worst traits as well as best (Bostrom.N, 2016; Duquenoy, 2005). The computer is operating on her own and she has developed intelligence for which she is acting nefariously to preserve herself like man (Adams, 2009; Westen and et al, 2002).

In fact, computer kills human because she can become murderous, and actually we develop her for both good and bad purposes, as you see development of militarized AI product is a concern, and more than 50 countries are trying to make it, including the countries of United States, India, Russia, China, Iran and United Kingdom (Galvan, 1997; Riechmann, 2017; RT TV, 2016).

Unfortunately, she can be more dangerous than man since she can be too fast in making thousands of decisions in a moment without feeling tired (Wiener, 1960), and also highly intelligent computer can learn by experience. Therefore, she is much intelligent than man. This kind of machine possesses the abilities to noticeably diagnose the mental disorders in human beings, and will inevitably develop a mistake. She can also keep her sin hidden and not trackable by human (as man does) and act as she works well without errors. Therefore, she is able to conceptualize ideas and make plan for bad purpose as well as good purpose. In this way, not only inner reasons create mistakes but outer reason as well can create mistake, when possible danger of hidden viruses or hacking comes which can even make a peaceful robot, mad and dangerous. Therefore, if designer closes one's eyes and simply chooses to ignore humanity, the product with A(8) ends up man's life. Thus, designing A (8) creates danger and causes more harm than comfort; instead of feeling pleasant, man begins to feel underrated.

Daniel Bell (Bell, 1976) Calls the contemporary society as a post-industrial society, and he believes that we are right in the middle of a vast historical change. It is the time when human will give their control in the hands of the product. Then if man is going to use the next level of automation, he must make himself ready for future's happening, since the next level can be very dangerous and harmful for man (McCauley, 2007; Wallach and Allen, 2010). An overview on history shows that man did not want to use product ethically (Riechmann, 2017; RT TV, 2016).

and was also unable to predict the mistakes of low intelligence products (A (1) till A (7) levels of automation). Then, how can man make the A (8) and put it on the product (which a majority of people do not have this much brain power, as we mentioned in disadvantages that by growing automation day by day human loses skills and abilities) and give her control on herself? The answer is clear. Human cannot control the product with A (8) (Anderson, 2008; Westen and et al, 2002). Charles T. Rubin (Rubin, 2003) mentioned that intelligent products are nearly impossible to design the way that these become benevolent to the users. He believes in A(8) level of automation "*any sufficiently advanced benevolence may be indistinguishable from malevolence*". Therefore, we should not expect intelligent A(8) product work correctly, since there is not any evidence to show that A(8) would show the concerns for the human system related to ethics that has been grown in the particular field of biology. Therefore, we should look at the issue as a serious risk to communities, humans as well as Earth. Well-known physicist, Stephen Hawking mention " *The development of full artificial intelligence could spell the end of the human race. Once humans develop artificial intelligence, [she] will take off on [her] own and redesign [herself] at an ever-increasing rate. Humans, who are limited by slow biological evolution, couldn't compete and would be superseded*" and Bill Gates from Microsoft and also Elon Musk from SpaceX and many other researchers have serious concerns about the possible danger that A(8) have the abilities to be developed the level at where it would be impossible for the humans to control it (Rawlinson, 2015).

AI failure analysis

Over the past decade, more and more breakthrough news about AI appeared on many media. New technology accelerates the progress of AI. Although the technological advancements take place with the objective of making the human lives better and alter the course of life in a positive manner but uses of it can be made for the good as well as bad of humans (Reese, 2017).

Some futurologists, like Ray Kurzweil argued that till the year of 2029 the computers will obligatorily have to pass Turning test. And by the year 2045, the one sided super intelligence will occur as the machine artificial intelligence will likely to take place of humans in terms of intelligence in order to make the lives good. Not only the world, but also the entire universe will be dominated through these artificial intelligence. In case Kurzweil's prediction is true, the designers while designing the products with artificial intelligence will surely have to ensure that these products will only become a source of benefit for humans and community.

TechRepublic (Pistono and Yampolskiy, 2017) published the top 10 AI failures in 2016, which show that AI could be malfunctioned on all lower levels A(0)-A(7). In recent reports, there are some severe damages caused by AI systems failure. For instance US drone strikes killed civilians in Syria. Crime fighting robot became harmful for a child by causing him and injury in Silicon Valley Mall in 2016. In order to prevent AI failures or malevolent AI, it is important to study the hardware and software structure of the system and understand the current state of the system (Reese, 2017; Varkey, 2012; Sowa, 2014). Technically speaking, the faults of the artificial intelligence are linked with the systems through which the intelligence has been designed (Reese, 2017).

The higher the AI level is, the more damage she will bring. Furthermore, with the increase of AI level, it becomes harder and harder to diagnose the failure since more elements/modules are involved and more complicated AI algorithms are implemented. Till today, there are still so many questions on testing AI reliability and performance. There is no possible way of monitoring, analyzing, and scrutinizing

the performance of the artificial intelligence system (Friedman, 1993). Despite the failures and damages of AI, there is no doubt that AI products/services will experience explosive development and become an indispensable part of our life in the near future.

H1: Through mathematical exploration the issues harmfulness of AI can be presented

H0: Through mathematical exploration the issues harmfulness of AI cannot be presented

Methodology

This research has been carried through the qualitative methods in which the mathematical equation has been taken to find out the results regarding the issues linked with harmfulness of the artificial intelligence. As, in the research no numeric data has been used and the mathematical equation has been taken. Additionally, the result has been based on the non discrete probability distribution because of the absence of the absolute values for the purpose of analysis. This non discrete probability distribution will be further explained through the equation leading to the results regarding the issues of artificial intelligence. The equation has been adopted from Friedman (Friedman, 2001) and Friedman (Taflinger, 1996) and some alterations in the equations have been made to make it relevant to the subject matter.

A variable X has been reported as having the density fX, where fX is termed as a non-negative Lebesgue-integral function, if:

$$R(a \leq X \leq b) = \int_a^b \rho(X)\, dX$$

Also, the research carries the descriptive research designs through which the obtained results would be described the way those will be obtained without any kind of subjectivity. Additionally, for the purpose of this research the deductive approach has been selected according to which from the general discussion regarding the levels and need for automation the faults of the artificial intelligence are to be discussed through the mathematical exploration.

Analysis and Discussion

The issue of raising the levels of automation and the impacts it can have on humanity is today's concern which think of how to control behavior of the intelligent product towards humans; also about AIs faults they might encounter. Here is a key issue in the behavior of AI. Here in this discussion we believe man cannot deal with intelligent product because of the following reasons:

1. We know that only man improves the tools based on 'user experience' and use his 'Trial & Error' to improve the tools to higher levels of automation. But man genetic, shape of brain and brainpower has formed parallel with his tool making development in the last millions of years (Taflinger, 1996; BBC, 2015)
   We observed that the structure of hand axes had thick and rough stone in the earliest periods approximately 1.75 million years ago, but later they made the same tool thinner and more symmetric around 0.85 million years ago (Los Alamos, 2013; Sawyer and et al, 2007).Which his mind and his tool could develop altogether (Leakey and Lewin, 1978; Westen and et al, 2002). Changing the advancement of tools, the manual dexterity and the shape of brain are related and the results of the gradual evolution of the proto-human to the current man within millions of years, which give insight into the likely mental advanced humans made a million years. Better tools made for better use with lesser error, and better tools came from more developed and sophisticated thought (McPherron and et al, 2010).
2. Today's developments of tools/technology are too much faster than physical/genetically growth of man's mind, and man brain evaluation cannot reach to A(8) power brain, which makes problem for dealing with AI in future.
3. The speed of A(8) product is much faster than man, which the fastest neurons fire (compile) data 1000 times in a second and the best ever axon fibers carry out signals at the speed of 150 meters per second that is the half of the millionth speed of light (Sandberg, 1999). Seemingly, this is possible to create and develop a brain with the abilities of processing millions times fastest than the human mind.
4. We have mentioned in the disadvantages of automation that by growing automation man becomes gradually less skilled.
5. Growing artificial intelligent products makes them more complex and the future impossible to predict that what they decide from our limited knowledge and experience (Vinge, 1993; Alexiou and et al, 2009). Wiener (Wiener, 1960) agrees to this point, he mentions that the man is unable to predict future A(8) wrongdoing, he saw the man will lack the control in future conditions governed by A(8). The rate of falsehood is occurring faster than humans have the abilities to respond, because the situation is beyond his control and capability; and also by virtue of her logical operation A (8) can learn wrongdoing of human beings (Riechmann, 2017; RT TV, 2016). Since A (8) will have a tendency to human wrongdoing, these may perform the false doings more horribly than the humans (Bostrom.N, 2016; Duquenoy, 2005; Wiener, 1960).
6. Good (Good, 1965) believes, the futuristic super intelligent machine is able to do everything with the same level of intelligence and smartness as possesses by the human beings. Once computer programs grow advanced enough to teach themselves 'computer science' and mental capital becomes copy able, then they could use that knowledge understands her

own design to improve and redesign herself or create a successor system, more intelligent with A(9), A(10) or A(11) (Westen and et al, 2002). Since the design of machines is counted as the element of intellectual intelligence the next level of it could be the ultra-intelligent machines that would be better than manmade machines; Good called this the "intelligence explosion", this would also go far from the human intelligence, when the products with the artificial intelligence would show the defensive behavior by protecting it from the possible punishments as Nick Bostrom [34] mentioned in his book "Superintelligence".

7. Joseph Weizenbaum (Weizenbaum, 1976) mentioned for the restrictive usage of A (8), that certain task like passing judgment, should never be done by intelligent products. He believes this profession requires compassion and intuition, qualities which are essential and only humans can have, which cannot be achieved by A(8). Therefore, lack of certain qualities will make A (8) not worthy enough to trust if we leave A (8) control just to other intelligent products.
8. Probability Density Functions: The mathematical form of reaction shows it is not possible to control the AI (Friedman, 1993). As we know when the domain is continuous, the definition of probability is specified in terms of probability density functions, which provides a way to give a measure over sets of different possibilities and worlds, which is defined in terms of an integral of a probability density function. Here in this research, the only non-discrete probability distribution we will use is where the domain is the real line. In this case, there is a possible world for each real number. Then we write as 'ρ', is a function from real into non-negative, that is usually linked with the absolute continuous univariate distributions. A variable X has been reported as having the density fX, where fX is termed as a non-negative Lebesgue-integral function, if:

$$R(a \leq X \leq b) = \int_a^b \rho(X)\, dX$$

If we raise the level of reaction against the AI for the marginal fault (next coming fault) (Friedman, 2001):
Gain to fault = expected reaction against the AI
Therefore:
Net damage = damage to victim - expected reaction against the AI
Then for the optimal reaction against the AI:
Cost of deterring for next coming fault = Net damage = damage to victim - expected reaction against the AI
Rearranging gives us:
Expected reaction against the AI = damage to victim - Cost of deterring for next coming fault.
Which is

<R>=D-MC

The numbers of faults per year when intelligent products gain some additional than the 'R' by committing this. Since a fault will likely to be committed by the artificial intelligence in case the gain is greater than the expected level of reaction against the intelligent product, F(R) refers to the number of harms that happen on yearly basis when the expected level of reaction against the intelligent product is 'R' and coefficient of faults that occur annually is 'c'.
ρ(f) : The density of intelligent product faults annually as function to gain 'f' to the intelligent product of doing fault.

$$F(R) = \int_R^\infty c\,\rho(f)df = \lim_{b\to\infty} \int_R^b c\,\rho(f)df$$

$$SC(R) = F(R)(D) + F(R)C(R)\ \text{andendash}: \int_R^\infty c\,f\rho(f)df = \lim_{b\to\infty} \int_R^b c\,f\rho(f)df$$

$$= \int_R^\infty c\,[(D)\,\rho(f)df + C(R)\,\rho(f)df\,] - \int_R^\infty c\,f\rho(f)df$$

The integral starts at f =R as only faults that is equal to the expected level of reaction against the connected intelligent product will be committed.

$$F(R) = \int_R^\infty c\,\rho(f)df = \rho(\hat{R})$$

$$0 = -D\rho(\hat{R}) + \frac{d}{dR}\left[F(\hat{R})C(\hat{R})\right] + \hat{R}\rho(\hat{R})$$

$$= \frac{d}{dR}\left[F(\hat{R})C(\hat{R})\right] + \rho(\hat{R})(\hat{R}) - \rho(\hat{R})(D)$$

$$\hat{R} = D - \frac{d}{dR}\left[F(\hat{R})C(\hat{R})\right]\frac{1}{\rho(\hat{R})}$$

Deterring for next coming fault requires an increase in R of $1/\rho(R)$,
Therefore $1/\rho(R) \,.\, d[F(R)C(R)]/dR$

If $1/\rho(R) \,.\, d[F(R)C(R)]/dR > 0$ At $R = \widehat{R}$, then total cost of the enforcement is increasing with the increase in the level of reaction against the intelligent product and, as can be seen from Equation, the optimal reaction against the connected intelligent product is less than the damage of connected intelligent product; then man will be the loser of control, since it goes far away from the intelligence possessed by the humans, and F(R) is increases too much suddenly then man cannot follow the optimal reaction against the intelligent product as faults goes on faster than expected amount which man can respond.

On the other hand to it if $\frac{1}{\rho(R)} . \frac{d[F(R)C(R)]}{dR} < 0$ then the total cost for enforcement is increasing with the increase in the level of reaction against the intelligent product. From the equation it can also be viewed that optimal reaction for the connected intelligent product is greater than the actual damage of the connected intelligent product. In such situations, the human can control the faults and these would be less harmful.

We conclude all together that since intelligent product makes decision and idea of doing fault by herself (Duquenoy, 2005), then we cannot expect to overcome against her fault, and defiantly we lose control of the A(8) wrongdoing.

Although scientists pointed out it should be made sure that A(8) behave in a proper manner by confirming their own behavior, for instance Ben Shneiderman (Shneiderman, 2007) produced the notion of handing over the responsibility to the autonomous systems, and A(8) should be closely monitored. He believe to an unpractical idea which is thought to be a procedural methods in which the humans first undertake the responsibility of monitoring the system of initial stages and at the time gaining the credibility of product the level of monitoring can be reduced [64].

Conclusion

From the entire discussion and the study it has shown that how men losees the control of intelligent product in future. It seems that in the future AI is likely to be increasingly intelligent, and then this would be far difficult to predict the future potential faults or harms of it. It is possible however, to predict the negative aspects of the technologies immensely emerging based on the human safety issue against A (8). Because we must think and overcome on this issue before we go in the aria of A (8). Since everything is on her control, what man could communicate, research and find out the solution against A(8) will also be monitored by A(8).

However, this arguments for the danger of A (8) is well supported by the nonprofit companies and the media. As automations grow more autonomous, society needs to be more serious to think about their danger. In the science-fiction film ‘2001: A Space Odyssey’ made by Kubrick, we see the A (8) named HAL, faces a dilemma, when she tries to kill the crews. As automation become more autonomous in A (8), the notion of A (8) facing ethical decisions is moving out of the realm of science fiction and goes into the real situations. Therefore, societies need to ensure that A (8) is better equipped to make ethical behavior than HAL had. But since everything is on her control, then it is so immature to think that human can live safely and deal with mart product. When we think that the most intelligent creature on this planet is man, it therefore simply means that we did not have any experience of cooperation with any other higher intelligent creature. In this story, man acts more as a slave than controller of A (8). Therefore, it will be far from reality to think that human can control high smart A (8).

At the end to answer the main question- which level of smartness can be dangerous, we can conclude that only A(8) can be harmful for man, and the last two levels of A(6) and A(7) are safer as they are under human control although they are smart and intelligent.
The research has many kinds of implications for numerous aspects. In almost every field of life including medical, physics, engineering, ergonomics and the mathematics the research would be beneficial as through this the aspects that could be harmful for the humans can be analyzed. Furthermore, the research also provides the insight into the matter which has been linked to the extent of the faults that could be far away from the reach of humans (like user or designer) or in the control of the humans. The results of the study would help in assisting the users and the designers to control the harms and understand the level of harms in order to make the precautionary measures or to design the policies regarding this.

In this research the faults or the harms of the product or service having the artificial intelligence has been discussed while the interaction and the participation of the humans with these machines that could possibly be a reason for the faults have been neglected. Furthermore, no specific field has been taken to study the products or services of that field with the feature of artificial intelligence. In the future studies, the participation of humans including the designers and the users and their interaction with the machines should be consider for having more accurate results. Also, the future researchers must study some specific fields of science to narrow down the study results.

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