The Ethics of Artificial Intelligence

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The Ethics of Artificial Intelligence

Undergraduate Thesis

Course: Enterprise Information Systems

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1. INTRODUCTION

1.1   Topic and the goal of the thesis

Machine learning and artificial intelligence (AI) systems are rapidly being adopted across the economy and society. Early excitement about the benefits of these systems has begun to be tempered by concerns about the risks that they introduce. Concerns that have been raised include possible lack of algorithmic fairness (leading to discriminatory decisions), potential manipulation of users, the creation of "filter bubbles", potential lack of inclusiveness, infringement of consumer privacy, and related safety and cyber security risks. It has been shown that the public – in the widest sense, thus including producers and consumers, politicians, and professionals of various stripes – do not understand how these algorithms work. But it is not only the public that does not understand how algorithms work. Many AI experts themselves are painfully aware of the fact that they cannot explain the way algorithms make decisions based on deep learning and neural networks. Hence there is also considerable concern among AI experts about the unknown implications of these technologies, which raise questions of ethical dilemmas within implementation of Artificial Intelligence. In terms of ethical challenges AI and robotics raise questions that are unprecedented. Given the increasing autonomy and intelligence of these systems we are not just talking about societal implications that merely ask for new ethical and legal frameworks.[1] As the boundaries between human subjects and technological objects are virtually disappearing in AI, these technologies affect our fundamental understanding of human agency and moral responsibility. Who bears responsibility for AI-behaviour is a complex ethical issue.

The goal of this seminar paper will be to explain the ethics of Artificial Intelligence in the details, and show the importance of it, to state how important ethics is in Artificial Intelligence with all the advantages and disadvantages and how easy can be violated and misused if not done properly.

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[1] Smith, Y. (2018) Ethics and Artificial Intelligence. Naked capitalism
https://www.nakedcapitalism.com/2018/12/ethics-artificial-intelligence.html (August 19,2019)

The development of Artificial Intelligence their history, importance and future will also be presented. Also, this seminar will show how ethical questions affect different fields of society, including Health Care, Car Industry and Employment. In other words, the most important facts about Ethics in Artificial Intelligence and Artificial Intelligence will be stated, as well as some of the solutions for future developments.

1.2   Methodology

In order to confirm the given objectives of this seminar paper the following methods were used: analysis of synthesis, introduction, deduction, investigation of literature (primary and secondary data) and mathematical and graphical methods for discussing founded results.

Literature for this seminar will be found online in the form of various books, articles, scientific papers and scientific research.

1.3   Structure of the thesis

The first part of the paper will be focused on Artificial Intelligence its definition, history, importance and current development. It will be an introduction to the main topic of this work of ethics of artificial intelligence where it will be presented through ethics research in machine learning, super intelligent, moral thinking and legal rights for machines also future and possible improvements will be shown.

Third part of the paper will discuss the impact of artificial intelligence in society through ethical questions in health care, car industry and employment.

This paper will show future solutions for ethical problems within an implementation of Artificial Intelligence in everyday routine. The final part of the paper will present conclusion based on main entries, findings and data collected through conducting surveys.

2 ARTIFICIAL INTELLIGENCE

2.1 Definition of Artificial Intelligence

Artificial intelligence (AI) is the simulation of human intelligence processes by machines, especially computer systems. These processes include learning (the acquisition of information and rules for using the information), reasoning (using rules to reach approximate or definite conclusions) and self-correction. Particular applications of AI include expert systems, speech recognition and machine vision. AI can be categorized as either weak or strong. Weak AI, also known as a narrow AI, is an AI system that is designed and trained for a particular task. Virtual personal assistants, such as Apple's Siri, are a form of weak AI. Strong AI, also known as artificial general intelligence, is an AI system with generalized human cognitive abilities. When presented with an unfamiliar task, a strong AI system is able to find a solution without human intervention.[2]

Figure 1: Components of AL
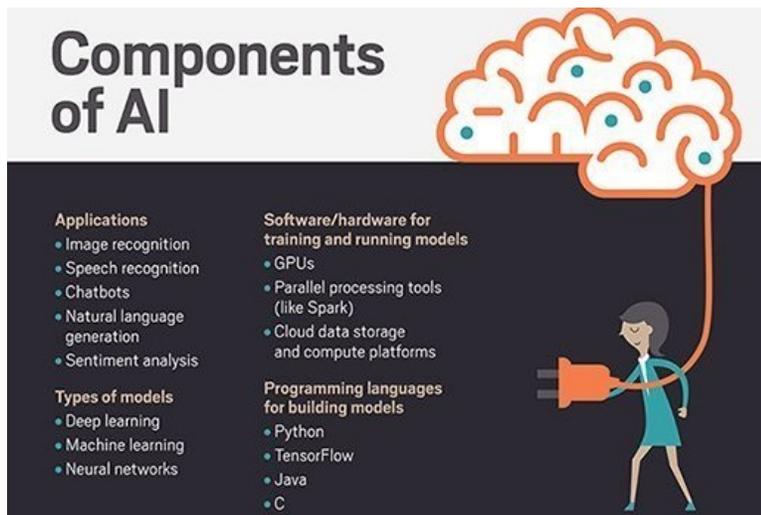
Source : https://searchenterpriseai.techtarget.com/definition/AI-Artificial-Intelligence

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[2] Rouse, M. (2018) Predictive storage analytics, AI deliver smarter storage. AI (artificial intelligence). https://searchenterpriseai.techtarget.com/definition/AI-Artificial-Intelligence (August 19, 2019)

Arend Hintze, an assistant professor of integrative biology and computer science and engineering at Michigan State University. He categorizes AI into four types, from the kind of AI systems that exist today to sentient systems, which do not yet exist. His categories are as follows:

Type 1: Reactive machines. An example is Deep Blue, the IBM chess program that beat Garry Kasparov in the 1990s. Deep Blue can identify pieces on the chess board and make predictions, but it has no memory and cannot use past experiences to inform future ones. It analyzes possible moves -- its own and its opponent -- and chooses the most strategic move. Deep Blue and Google's Alpha GO were designed for narrow purposes and cannot easily be applied to another situation.

Type 2: Limited memory. These AI systems can use past experiences to inform future decisions. Some of the decision-making functions in autonomous vehicles have been designed this way. Observations used to inform actions happening in the not-so-distant future, such as a car that has changed lanes. These observations are not stored permanently.

Type 3: Theory of mind. This is a psychological term. It refers to the understanding that others have their own beliefs, desires and intentions that impact the decisions they make. This kind of AI does not yet exist.

Type 4: Self-awareness. In this category, AI systems have a sense of self, have consciousness. Machines with self-awareness understand their current state and can use the information to infer what others are feeling. This type of AI does not yet exist.[3]

The AI technology can be seen in many fields around us we can take example in healthcare. The biggest bets are on improving patient outcomes and reducing costs. Companies are applying machine learning to make better and faster diagnoses than humans. One of the best known healthcare technologies are IBM Watson. It understands natural language and is capable of responding to questions asked of it. The system mines patient data and other available data sources to form a hypothesis, which it then presents with a confidence scoring schema. Other AI applications include chatbots, a computer program used online to answer questions and assist customers, to help schedule follow-up appointments or aiding patients through the billing

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[3] Artificial Intelligence https://exploreai.org/p/ai-definition (August 19, 2019)

process, and virtual health assistants that provide basic medical feedback. [4] But we'll get to that in more detail below.

2.2. *History of Artificial Intelligence*

The idea of inanimate objects coming to life as intelligent beings has been around for a long time. The ancient Greeks had myths about robots, and Chinese and Egyptian engineers built automatons. The beginnings of modern AI can be traced to classical philosophers' attempts to describe human thinking as a symbolic system. But the field of AI wasn't formally founded until 1956, at a conference at Dartmouth College, in Hanover, New Hampshire, where the term "artificial intelligence" was coined.[5]

The term artificial intelligence was first coined by John McCarthy in 1956 when he held the first academic conference on the subject. But the journey to understand if machines can truly think began much before that. In Vannevar Bush's seminal work "As We May Think", he proposed a system which amplifies people's own knowledge and understanding. Five years later Alan Turing wrote a paper on the notion of machines being able to simulate human beings and the ability to do intelligent things, such as play Chess.[6] But achieving an artificially intelligent being wasn't so simple. After several reports criticizing progress in AI, government funding and interest in the field dropped off – a period from 1974–80 that became known as the "AI winter." By 1974 computers flourished. They were now faster, more affordable and able to store more information. Early demonstrations such as Allen Newell and Herbert Simon's General Problem Solver and Joseph Weizenbaum's ELIZA, which was funded by Research and Development Corporation (RAND), showed promise toward the goals of problem-solving and the interpretations of spoken language in machines, and yet there was still a long way to go before machines could think

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[4] Rouse, M. (2018) Predictive storage analytics, AI deliver smarter storage. AI (artificial intelligence). https://searchenterpriseai.techtarget.com/definition/AI-Artificial-Intelligence (August 19, 2019)
[5] Lewis, T. (2014) A Brief History of Artificial Intelligence. Livescience. https://www.livescience.com/49007-history-of-artificial-intelligence.html (August 19, 2019)

[6] Smith, C. et al: (2006) The History of Artificial Intelligence. University of Washington. https://courses.cs.washington.edu/courses/csep590/06au/projects/history-ai.pdf (August 19, 2019)

abstractly, self-recognize and achieve natural language processing.[7] The field revived in the 1980s when the British government started funding it again in part to compete with efforts by the Japanese. John Hopfield and David Rumelhart popularized "deep learning" techniques which allowed computers to learn using experience. On the other hand, Edward Feigenbaum introduced expert systems which mimicked decision making processes of a human expert. In 1997, IBM's Deep Blue became the first computer to beat a chess champion when it defeated Russian grandmaster Garry Kasparov. But it was not until the 2000's that many of the landmark goals were achieved and AI thrived despite lack of government funds and public attention.

The new millennium was underway – and after the fears of Y2K died down – AI continued trending upward. As expected, more artificially intelligent beings were created as well as creative media (film, specifically) about the concept of artificial intelligence and where it might be headed.

2000: The Y2K problem, also known as the year 2000 problem, was a class of computer bugs related to the formatting and storage of electronic calendar data beginning on 01/01/2000. Given that all internet software and programs had been created in the 1900s, some systems would have trouble adapting to the new year format of 2000 (and beyond). Previously, these automated systems only had to change the final two digits of the year; now, all four digits had to be switched over – a challenge for technology and those who used it.[8] The current decade has been immensely important for AI innovation. From 2010 onward, artificial intelligence has become embedded in our day-to-day existence. We use smartphones that have voice assistants and computers that have "intelligence" functions most of us take for granted. AI is no longer a pipe dream and hasn't been for some time.[9]

[7] Aguis, C. (2017) Evolution of AI: Past, Present, Future. Medium.
https://medium.com/datadriveninvestor/evolution-of-ai-past-present-future-6f995d5f964a (August 20, 2019)
[8] Reynoso, R. (2019) A Complete History of Artificial Intelligence. https://learn.g2.com/history-of-artificial-intelligence#ai-8 (August 20, 2019)
[9] Reynoso, R. (2019) A Complete History of Artificial Intelligence. https://learn.g2.com/history-of-artificial-intelligence#ai-8 (August 20, 2019)

2.3. Importance of Artificial Intelligence

Artificial Intelligence is the machines which are designed and programmed in such a manner that they and think and act like a human. Artificial Intelligence becomes the important part of our daily life. Our life is changed by AI because this technology is used in a wide area of day to day services. These technologies reduce human effort. Now in many industries, people are using this technology to develop machine slaves to perform the different activity. Using the machine for the work speed up your process of doing work and give you an accurate result. The introduction of AI brings the idea of error free world. This technology will slowly introduce in the entire sector to reduce human effort and give accurate and faster result.[10] Advancements in ubiquitous computing, low-cost cloud services, new algorithms, data analytics and other technologies are now allowing AI to flourish.

• According to IDC, the worldwide content analytics, discovery and cognitive systems software market, which represents some of the AI market, will grow to US $9.2 billion in 2019.

• Accenture research reveals that by 2035, AI can double economic growth rates in 12 developed countries, and boost labor productivity by up to 40 percent.

• Up to 85% of business and IT executives anticipate making extensive investments in one or more AI-related technologies over the next three years.

To unlock the opportunity presented by AI, enterprises must focus on three areas:

- Transform relationship between humans and machines—Using AI, people will be able to spend more time on exceptional work: the 20% of no routine tasks that drive 80% of value creation.

- Reimagine business models and processes—Smart machines will continually review end-to-end processes and apply "intelligent automation of process change" to refine and optimize.

- Unlock trapped value of data— Companies will apply AI to greatly enhance large data analytics, evolve algorithms with transactional data faster, and combine data in new ways to discover trends and deliver deep insights.

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[10] Rounak (2017). Globussoft. https://globussoft.com/importance-of-artificial-intelligence/ (August 22, 2019)

AI drives business value by combining human orchestration and ingenuity with constantly improved processes and refined data—all delivered through the exponential speed and self-learning power of AI capabilities.[11]

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[11] Accenture. (2017) https://www.accenture.com/_acnmedia/pdf-54/accenture-artificial-intelligence-ai-overview.pdf (August 22, 2019)

3. ETHICS OF ARTIFICIAL INTELLIGENCE

3.1. Ethics in machine learning

Ethics is a set of moral principles that govern the behavior of a group or individual.[12] "Human beings function better if they are deceived by their genes into thinking that there is a disinterested objectives morality binding upon them, which all should obey" E.O.Wilson.[13] The extenuating thing is that moral codes have much in common from culture to culture "moral deep structure". The moral codes that are common from culture to culture are:[14]

- Reciprocity, both in aggression and in beneficence

- Pecking orders, rank, status, authority

- Within the framework, universality of basic moral rules

- Honesty and trustworthiness is valued

- Unprovoked aggression denigrated

- Ranking of rules, for example, stealing is not as bad as murder

The bottom line is that a moral code is a set of rules that evolved under the pressure that obeying these rules against peoples individual interest and common sense has tended to make societies prosper, in particular to be more numerous enviable, militarily powerful, and more apt to spread their ideas in other way.[15]

The question of whether machine ethics exist or might exist in the future is difficult to answer if we can't agree on what counts as machine ethics. Some might argue that machine ethics obviously exist because humans are machines and humans have ethics. Others could argue that machine ethics obviously doesn't exist because ethics is simply emotional expression and machines can't have emotions. [16]A wide range of positions on machine ethics are possible. When people speak of technology and values, they're often thinking of ethical values. But not all values

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[12] TechTerms. Computer Ethics https://techterms.com/definition/computerethics (August 22, 2019)

[13] Richards, R.J. Darwin's evolutionary ethics. The Empirical and Normative Justification. Chapter eight. http://home.uchicago.edu/~rjr6/articles/Moral%20Justification%20of%20Darwinian%20Ethics.pdf (August 24, 2019)

[14] Anderson, M.; Anderson, S.L. (2011) Machine Ethics. Cambridge University Press 2011. Cambridge Massachusetts. (August 24, 2019)

[15] Storrs Hall, J. (2000) Ethics for Machines. https://autogeny.org/ethics.html (August 25, 2019)

[16] Gunkel, D.J.G. (2012) The Machine Question: Critical Perspectives on AI, Robots, and Ethics, The MIT Press. Cambridge, Massachusetts. London, England (August 25, 2019)

are ethical. For example, practical, economic, and aesthetic values don't necessarily draw on ethical considerations. A product of technology, such as a new sailboat, might be practically durable, economically expensive, and aesthetically pleasing, absent consideration of any ethical values[17]. A typical theorem proves is a normative agent but not an ethical one.[18] You can evaluate computing technology in terms of not only design norms (that is, whether it's doing its job appropriately) but also ethical norms. The example of ethical norm is given by "wired" magazine: Qatar is an oil-rich country in the Persian Gulf that's friendly to and influenced by the West while remaining steeped in Islamic tradition.[19] In Qatar, these cultural traditions sometimes mix without incident— for example, women may wear Western clothing or a full veil. And sometimes the cultures conflict, as illustrated by camel racing, a pastime of the region's rich for centuries. Camels jockeys must be light—the lighter the jockey, the faster the camel. Camel owners enslave very young boys from poorer countries to ride the camels. Owners have historically mistreated the young slaves, including limiting their food to keep them lightweight. The United Nations and the US State Department have objected to this human trafficking, leaving Qatar vulnerable to economic sanctions. The machine solution has been to develop robotic camel jockeys. The camel jockeys are about two feet high and weigh 35 pounds. The robotic jockey's right hand handles the whip, and its left handles the reins. It runs Linux, communicates at 2.4 GHz, and has a GPS-enabled camel-heart-rate monitor[20]. In this example we can see positive side of implied computer technology because of robotic jockeys kids from poorer countries are freed from slavery with opportunities like they didn't had before. It is also positive not only for kids but community of Qatar as they will not be vulnerable to economic sanctions. But every medal have two sides so is Artificial Intelligence there is fear among philosophers that Artificial Intelligence will replace us on the top of the food chain. Keith Frankish a Cambridge professor and author of "The Cambridge Handbook of Artificial Intelligence" explained it like this: "Let us suppose that the AI is not only clever, but that, as part of the process of improving its own intelligence, it has

[17]Anderson, M. Leigh Anderson, S. (2011) Machine Ethics. Cambridge University Press. United States of America. (August 25, 2019)

[18] Moore, J.H. (2006) Machine Ethics The Nature, Importance, and Difficulty of Machine Ethics. Dartmouth College. Hanover, New Hampshire. (August 26, 2019)

[19] Moore, J.H. (2006) Machine Ethics The Nature, Importance, and Difficulty of Machine Ethics. Dartmouth College. Hanover, New Hampshire. (August 26, 2019)

[20] Moore, J.H. (2006) Machine Ethics The Nature, Importance, and Difficulty of Machine Ethics. Dartmouth College. Hanover, New Hampshire. (August 26, 2019)

unhindered access to its own source code: it can rewrite itself to anything it wants itself to be. Yet it does not follow that the AI must want to rewrite itself to a hostile form."[21] Human dominance is down to our intelligence but what if we create AI that is smarter than us? This concept is called 'singularity': the point at which humans are no longer the most intelligent beings on earth[22].

This brings to mind Isaac Asimov's "Three Laws of Robotics":

1. A robot may not injure a human being or, through inaction, allow a human being to come to harm.
2. A robot must obey orders given it by human beings except where such orders would conflict with the First Law.
3. A robot must protect its own existence as long as such protection does not conflict with the First or Second Law.[23]

Singularity would overthrow these rules. British mathematician and cryptologist I.J. Good first warned of singularity when he coined the term 'intelligence explosion' in his 1965 essay, Speculations Concerning the First Ultra intelligent Machine.[24] An intelligence explosion could occur when we succeed in building Artificial General Intelligence (AGI), whereby a system would be capable of recursive self-improvement, ultimately leading to Artificial Super Intelligence (ASI).[25]The AGI would understand its own design to such an extent that it could redesign itself or create a successor system, which would then redesign itself, and so on, with unknown limits.[26]

So as we can see from giving examples, both positive and negative Artificial Intelligence in terms of ethics still have a long way to go in defining what exactly is an ethical norm for Artificial Intelligence to follow.

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[21] Bostrum, N.; Yudkowsky, E. (2011) The Ethics of Artificial Intelligence Draft for Cambridge Handbook of artificial Intelligence. Cambridge University Press. (August 27, 2019)
[22] Sysiak, P. (2016) AI Revolution 101 AI Revolution. Medium.com https://medium.com/ai-revolution/ai-revolution-101-8dce1d9cb62d (August 27, 2019)
[23] Leigh Anderson, S. (2006) Asimov's "Three Laws of Robotics" and Machine Metaethics. University of Connecticut. https://www.aaai.org/Papers/Symposia/Fall/2005/FS-05-06/FS05-06-002.pdf (August 27, 2019)
[24] Lee, J. (2018) The Ethics of Artificial Intelligence. GrowthBot . https://blog.growthbot.org/the-ethics-of-artificial-intelligence (August 27, 2019)
[25] De Spiegeleire, S. (2017) ARTIFICIAL INTELLIGENCE AND THE FUTURE OF intelligence and the future of defense: strategic implications for small- and medium-sized force providers (August 27, 2019) https://dokumen.tips/documents/artificial-intelligence-and-the-future-of-intelligence-and-the-future-of-defense.html
[26] Lee, J. (2018) The Ethics of Artificial Intelligence. GrowthBot . https://blog.growthbot.org/the-ethics-of-artificial-intelligence (August 27, 2019)

3.2. Super intelligent moral thinking

J. Good (1965) set forth the classic hypothesis concerning super intelligence: that an AI sufficiently intelligent to understand its own design could redesign itself or create a successor system, more intelligent, which could then redesign itself yet again to become even more intelligent, and so on in a positive feedback cycle. Yudkowsky (2008) lists three families of metaphors for visualizing the capability of a smarter than human AI:[27]

• Metaphors inspired by differences of individual intelligence between humans: AIs will patent new inventions, publish ground-breaking research papers, make money on the stock market, or lead political power blocks. [28]

• Metaphors inspired by knowledge differences between past and present human civilizations: Fast AIs will invent capabilities that futurists commonly predict for human civilizations a century or millennium in the future, like molecular nanotechnology or interstellar travel. [29]

• Metaphors inspired by differences of brain architecture between humans and other biological organisms: E.g., Vinge (1993): "Imagine running a dog mind at very high speed. Would a thousand years of doggy living add up to any human insight?" That is: Changes of cognitive architecture might produce insights that no human level mind would be able to find, or perhaps even represent, after any amount of time[30].

Even if we restrict ourselves to historical metaphors, it becomes clear that superhuman intelligence presents ethical challenges that are quite literally unprecedented. A hypothetical moment in time when artificial intelligence and other technologies have become so advanced that humanity undergoes a dramatic and irreversible change is called singularity.[31] The term singularity was first introduced by Vernor Vinge in his science fiction novel Marooned in Real-

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[27] Bostrum, N.; Yudkowsky, E. (2011) The Ethics of Artificial Intelligence Draft for Cambridge Handbook of artificial Intelligence. Cambridge University Press.
[28] Bostrum, N.; Yudkowsky, E. (2011) The Ethics of Artificial Intelligence Draft for Cambridge Handbook of artificial Intelligence. Cambridge University Press.
[29] Bostrum, N.; Yudkowsky, E. (2011) The Ethics of Artificial Intelligence Draft for Cambridge Handbook of artificial Intelligence. Cambridge University Press.
[30] 30 Bostrum, N.; Yudkowsky, E. (2011) The Ethics of Artificial Intelligence Draft for Cambridge Handbook of artificial Intelligence. Cambridge University Press.
[31] Ahlberg, L. (2018) THE EFFECTS OF THE TECHNOLOGICAL SINGULARITY
https://pawsthetics.files.wordpress.com/2018/05/lanna-ahlberg-_-the-singularity.pdf (August 28, 2019)

time and later developed the concept in his essay the Coming Technological Singularity[32]. His definition of Singularity is widely known as the event horizon thesis and in essence says that Trans or post-human minds will imply a weirder future than we can imagine: "Within thirty years, we will have the technological means to create superhuman intelligence. Shortly after, the human era will be ended. [...] I think it's fair to call this event a singularity. It is a point where our models must be discarded and a new reality rules. As we move closer and closer to this point, it will loom vaster and vaster over human affairs till the notion becomes a commonplace. Yet when it finally happens it may still be a great surprise and a greater unknown."[33] The "moral singularity" refers to how morality – a particular system of values and principles of conduct – will evolve radically once (a) human intelligence and cognition is enhanced, and (b) artificial general intelligence (AGI) enters the world. Moral codes are rules based on compilations of ethical analysis and will also advance as intelligence and ethics advance, although more slowly. An increase in ethics and morality is a fundamental part of an intelligence singularity.[34] As our ability to analyze ethical decisions increases, we will make better decisions and subsequently, increase our ability to accurately prioritize efforts in information gathering and to analyze and process that information. This turns into a cyclical process, with positive feedback pushing it toward becoming a hyperbolic growth curve. [35]Intelligence promotes ethical reasoning, which in turn promotes intelligence. An ethical cascade positive feedback loop will produce an intelligence singularity.[36]

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[32]What is the best definition of Singularity? http://www.singularitysymposium.com/definition-of-singularity.html (August 28, 2019)

[33] What is the best definition of Singularity? Singularity Symposium. http://www.singularitysymposium.com/definition-of-singularity.html (August 28, 2019)

[34] Faggella, D. (2018) Moral Singularity. Faggella https://danfaggella.com/moral-singularity/ (August 28, 2019)

[35] Fink, O. (2012) Ethical Cascade Singularity. HackingTheUniverse http://www.hackingtheuniverse.com/singularity/ethics/ethical-cascade-singularity (August 28, 2019)

[36] Fink, O. (2012) Ethical Cascade Singularity. HackingTheUniverse http://www.hackingtheuniverse.com/singularity/ethics/ethical-cascade-singularity (August 28, 2019)

3.3. Legal rights for machines

Science fiction likes to depict robots as autonomous machines, capable of making their own decisions and often expressing their own personalities, if a machine can think, decide and act on its own volition, if it can be harmed or held responsible for its actions, should we stop treating it like property and start treating it more like a person with rights?[37] These are some of the issues being discussed by the European Parliament's Committee on Legal Affairs. Last year it released a draft report and motion calling for a set of civil law rules on robotics regulating their manufacture, use, autonomy and impact upon society. Of the legal solutions proposed, perhaps most interesting was the suggestion of creating a legal status of "electronic persons" for the most sophisticated robots, also one of the European Parliament's Committee on Legal Affairs General principles is that whereas, until such time, if ever, that robots become or are made self-aware, Asimov's Laws must be regarded as being directed at the designers, producers and operators of robots, since those laws cannot be converted into machine code.[38]

Asimov's laws state that

- A robot may not injure a human being or, through inaction, allow a human being to come to harm.

- A robot must obey the orders given it by human beings except where such orders would conflict with the First Law.

- A robot must protect its own existence as long as such protection does not conflict with the First or Second Laws (See Runabout, I. Asimov, 1943).[39]

If we did give robots some kind of legal status, what would it be? If they behaved like humans we could treat them like legal subjects rather than legal objects, or at least something in between. Legal subjects have rights and duties, and this gives them legal "personhood". They do not have to be physical persons; a corporation is not a physical person but is recognized as a legal subject. Legal objects, on the other hand, do not have rights or duties although they may have economic

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[37] Bowyer, K. (2017) Robot rights: at what point should an intelligent machine be considered a 'person'? The conversation. http://theconversation.com/robot-rights-at-what-point-should-an-intelligent-machine-be-considered-a-person-72410 (August 29, 2019)

[38] Future Robots May be Considered "Electronic Persons" https://futurism.com/71125-2 (August 29, 2019)

[39] Future Robots May be Considered "Electronic Persons" https://futurism.com/71125-2 (August 29, 2019)

value. Perhaps the approach to robots could be similar to that of corporations?[40] The robot (or software program), if sufficiently sophisticated or if satisfying certain requirements, could be given similar rights to a corporation. This would allow it to earn money, pay taxes, own assets and sue or be sued independently of its creators. Its creators could, like directors of corporations, have rights or duties to the robot and to others with whom the robot interacts. [41]Robots would still have to be partly treated as legal objects since, unlike corporations, they may have physical bodies. The "electronic person" could thus be a combination of both a legal subject and legal objects. Although an emotional autonomous system or robot, even having an independent intelligence and emotion this would not create in my way a legal personality with the rights and obligations vested on natural and legal persons. Legal right raises questions in the form of voting right, elections, and many more.[42] At this moment there are too many unanswered questions to make decisions should machines have rights. In my opinion the machines are still not perfected to give them rights, but if they keep developing at this fast rate who knows what will future bring.

3.4. Future of Artificial Intelligence Regarding Ethics

The humankind is currently experiencing a life supported often with intelligent systems designed and developed based on the foundations of Artificial Intelligence. It is clear that this scientific field is one of key elements for shaping better future for us. But there are also some anxieties regarding possible ethical and safety related issues that may arise because of intense use of powerful Artificial Intelligence oriented systems. From a general perspective, it is possible to indicate that the Artificial Intelligence is making our life more practical and easier. Thanks to different approaches, methods, and techniques of Artificial Intelligence, it is now not impossible to solve advanced, complex problems or spend more time for solving such problems via

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[40] Solaiman, S.M. (2017) Legal personality of robots, corporations, idols and chimpanzees: a quest for legitimacy. University of Wollongong Australia.

[41] Bowyer, K. (2017) Robot rights. Smartcompany. https://www.smartcompany.com.au/startupsmart/news/robot-rights-at-what-point-should-an-intelligent-machine-be-considered-a-person/ (September 1, 2019)

[42]Nevejans , N.(2016) European Parliament; EUROPEAN CIVIL LAW RULES IN ROBOTICS. http://www.europarl.europa.eu/RegData/etudes/STUD/2016/571379/IPOL_STU(2016)571379_EN.pdf (September 1, 2019)

traditional solution ways.[43] Because of that, Artificial Intelligence seems promising a good, better future life for the whole humankind. But on the other side of the medallion, there are already serious discussions on a dystopian future of Artificial Intelligence with many important issues associated with ethical and safety oriented issues. Examples abound. In 2014, Amazon developed a recruiting tool for identifying software engineers it might want to hire; the system swiftly began discriminating against women, and the company abandoned it in 2017. In 2016, ProPublica analyzed a commercially developed system that predicts the likelihood that criminals will re-offend, created to help judges make better sentencing decisions, and found that it was biased against blacks.[44] A research survey by Data & Society asserts that for AI to "benefit the common good," it must avoid harm to fundamental human values. This includes the extent to which we allow AI to make decisions of its own. Further to this Mark Latonero a Lead Research for Human Rights and AI at the Data & Society Research Institute offered some initial recommendations:

- Technology companies should find effective channels of communication with local civil society groups and researchers, particularly in geographic areas where human rights concerns are high, in order to identify and respond to risks related to AI deployments.

- Technology companies and researchers should conduct Human Rights Impact Assessments (HRIAs) through the life cycle of their AI systems. Researchers should revaluate HRIA methodology for AI, particularly in light of new developments in algorithmic impact assessments. Toolkits should be developed to assess specific industry needs.

- Governments should acknowledge their human rights obligations and incorporate a duty to protect fundamental rights in national AI policies, guidelines, and possible regulations. Governments can play a more active role in multilateral institutions, like the UN, to advocate for AI development that respects human rights.

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[43] Kose ,U. Cankaya, A.I. Yigit, T. (2017) Ethics and Safety in the Future of Artificial Intelligence: Remarkable Issues
https://www.researchgate.net/publication/326252493_Ethics_and_Safety_in_the_Future_of_Artificial_Intelligence_Remarkable_Issues (September 1, 2019)
[44] Kose ,U. Cankaya, A.I. Yigit, T. (2017) Ethics and Safety in the Future of Artificial Intelligence: Remarkable Issues
https://www.researchgate.net/publication/326252493_Ethics_and_Safety_in_the_Future_of_Artificial_Intelligence_Remarkable_Issues (September 1, 2019)

- Since human rights principles were not written as technical specifications, human rights lawyers, policy makers, social scientists, computer scientists, and engineers should work together to operationalize human rights into business models, workflows, and product design

- Academics should further examine the value, limitations, and interactions between human rights law and human dignity approaches, humanitarian law, and ethics in relation to emerging AI technologies. Human rights and legal scholars should work with other stakeholders on the trade-offs between rights when faced with specific AI risks and harms. Social science researchers should empirically investigate the on-the-ground impact of AI on human rights.

- UN human rights investigators and special rapporteurs should continue researching and publicizing the human rights impacts resulting from AI systems. UN officials and participating governments should evaluate whether existing UN mechanisms for international rights monitoring, accountability, and redress are adequate to respond to AI and other rapidly emerging technologies. UN leadership should also assume a central role in international technology debates by promoting shared global values based on fundamental rights and human dignity.[45]

But we should not rely solely upon codes of ethics or international human rights to govern emerging technologies. Researchers are working currently on designing safe agents, which are small but important parts of bigger problems solved carefully in detail. At this point, more research works to achieve the following types of agents should be done more:

- Interruptible Agents,
- Ignorant Agents,
- Inconsistent Agents,
- Bounded Agents.[46]

To conclude, it has never been a more exciting time to be a part of the rise of AI, but there's a lot of work to be done now and in the future to ensure we're using the technology responsibly.

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[45] Latonero, M. (2018) Governing Artificial Intelligence: UPHOLDING HUMAN RIGHTS & DIGNITY. Data&Society .US.
[46] Latonero, M. (2018) Governing Artificial Intelligence: UPHOLDING HUMAN RIGHTS & DIGNITY. Data&Society . US

4. EXAMPLES OF ARTIFICIAL INTELLIGENCE AND ETHICAL QUESTIONS IN TODAY SOCIATY

4.1. Ethical Questions in Health Care

Artificial Intelligence and healthcare share a well-established past. Healthcare was one of the first practical applications for early Artificial Intelligence systems like Dendral. Today Healthcare-based Artificial intelligence systems are some of the well-funded initiative's in the technology sector.[47]

Artificial Intelligence is gradually changing medical practice. With recent progress in digitized data acquisition, machine learning and computing infrastructure, Artificial Intelligence applications are expanding to areas that were previously thought to be only the province of human experts. Artificial Intelligence in medicine, which is the focus of this review, has two main branches: virtual and physical. The virtual branch includes informatics approach from deep learning information management to control health management system, including electronic health records, and active guidance of physicians in their treatment decisions. The physical branch is best represented by robots used to assists the elderly patient or the attending surgeon.[48]

Let us look at the emerging uses of AI in medicine:

- 1/ Image recognition technology:

Using The same technology that Facebook use for image recognition : (analyzing and contextualizing the content of images in detail and compares them to identify similarities and thereby determine what is being shown in an image.) image recognition technology can analyze data from imaging studies such as EKGs, EEGs, X-rays, MRIs, and CT scans, compiling millions of interpretations of results by expert physicians to make more accurate diagnoses and might make predictions or recognize diseases as effectively as or even better than doctors :

- A group of searchers from Google performed an AI technique called convolutional neural network (CNN) machine learning and demonstrated that AI achieves image-level scores above

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[47] Infosys AI for Healthcare: Balancing Efficiency and Ethics.(2018) https://www.infosys.com/smart-automation/Documents/ai-healthcare.pdf (September 2, 2019)

[48] Yu,K-H. Beam, A.L. Kohane, I. (2018) Nature Biomedical Engineering. Harvard Medical School. https://www.researchgate.net/publication/328200067_Artificial_intelligence_in_healthcare (September 2, 2019)

97% on both the Camelyon16 test set (metastasis detection of lymph nodes) and an independent set of 110 slides, compared to a human pathologist who achieved 73.2% sensitivity.

- Another group of Scientists has tested CNN performance against 21 board-certified dermatologists on biopsy-proven clinical images, with two binary case studies: (keratinocyte carcinomas VS benign seborrhea keratosis, and malignant melanomas VS benign nevi. They found that CNN performs skin cancer classification at a level of competence comparable to dermatologists.

- 2 / Motion Recognition Technology

Scientists have developed supervised machine learning algorithms for complex motion phenotypes obtained from cardiac MRIs and found that the patterns of cardiac motion were associated with increased survival rates in patients with PH, compared with conventional parameters.

- 3/ Electronic prescriptions

AI may facilitate communication between physicians and patients by decreasing processing times, thereby increasing the quality of patient care. Electronic prescription as it exists today may be problematic since sometimes patients cannot get their medications due to mismatches between prescribed medications and insurance company rules or system errors.

- 4/ Scheduling conflicts solution

AI could prioritize appointment scheduling based on the risk of readmission and overall severity of an illness in order to reduce readmissions.

- 5/Assisting patient triage based on symptoms

AI may assist patient triage based on symptoms. For example, the digital health firm Health Tap developed "Dr. A.I.," which operates based on past medical history and knowledge extracted from experienced physicians, and asks patients to specify symptoms to triage whether they should go to the ED, urgent care, or a primary care doctor.

- 6/Body censors Technology

In the near future, body censors for blood sugar, hematocrit, oxygen saturation, HbA1C, lipids, infection, and inflammation biomarkers, which are signs of volume overload or dehydration, will also be integrated into AI technology.

- 7/Computer assisted surgery

Robotically-assisted surgery was developed to overcome the limitations of pre-existing minimally-invasive surgical procedures and to enhance the capabilities of surgeons performing open surgery. As a future doctor, I can assure you that a third hand for a surgeon would open up incredible horizons for all its advantages: Shorter hospitalization Reducing pain and discomfort, Faster recovery time and return to normal activities, Smaller incisions, reducing the risk of infection Reducing blood loss and transfusions Minimalizing scarring. Further advantages are articulation beyond normal manipulation and three-dimensional magnification.[49]

AI systems can easily be taught to cheat. In healthcare developers could feasibly create AI healthcare applications that are misaligned with the values of care providers. Machines could be taught to push practitioners toward clinical actions that improve quality metrics rather than patient care. They could skew public evaluation data reviewed by potential hospital regulators. Or they could be programmed to promote clinical decisions that generate profits for specific manufacturers, designers, or purchasers. In all these cases, the goal of profit motive reigns over patient care – a clear misalignment with a care provider values.[50]

So how can healthcare privacy and security experts uphold the principles of ethical AI to champion its use in empowering better decision-making and patient trust?

- Choose vendors that view AI through an ethical and legal lens. Aligned values might include growing patient trust and improving patient care, while humans can be kept in the loop to help determine whether an investigation should be opened.
- Use AI to empower experts. Healthcare organizations can also take a bottom-up approach to keeping humans in the loop by ensuring oversight of any learning system. Make sure you're using humans to keep machines accountable – and to make grey-area decisions. And implement AI as a way to empower experts to make better decisions – not to replace them.

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[49] Abdessamiaa. G.(2017) Artificial Intelligence and the future of Healthcare delivery. A Medium Corporations. https://medium.com/@gandoul.abdessamiaa/artificial-intelligence-and-the-future-of-healthcare-delivery-dd40b4356006 (September 3, 2019)

[50] FaireWarning.(2018) Harnessing the Power of AI in Healthcare: 3 Ethical and Legal Considerations for Patient Privacy and Data Security file:///C:/Users/Korisnik/Downloads/harnessing-the-power-of-ai-in-healthcare-whitepaper-fairwarning%20(1).pdf (September 3, 2019)

- Prioritize the ethical and legal treatment of AI. Healthcare organizations can create internal roles for senior-level ethicists or counsel who can help implement ethically aligned design at the organization.[51]

The future of the AI in the healthcare is personalized health care the massive data analysis capabilities of deep learning AI systems promise faster and more accurate diagnoses, custom treatment and clinical care plans, and cheaper, more effective drugs tailored to each patient's disease and needs--and these applications are just the tip of the iceberg. Though it's still early days, the achievements already made by AI in healthcare are exciting, and point to a healthy future.[52] The future looks bright for artificial intelligence regarding health care but the main problem and obstacle that developers and researchers need to solve is the ethic side of the technology because if the patient doesn't trust AI it all falls down.

4.2. Ethical Questions in Car Industry

The ethical questions regarding artificial intelligence and car industry are one of the most popular ethical questions regarding artificial intelligence in the world today. First and for now the only attempt to provide official guidelines for the ethical choices of autonomous vehicles is given by German Ethics Commission on Automated and Connected Driving they introduce twenty rules regarding ethics of autonomous vehicle maybe the most important are rule 7 and rule 9.

Rule 7: In hazardous situations that prove to be unavoidable, despite all technological precautions being taken, the protection of human life enjoys top priority in a balancing of legally protected interests. Thus, within the constraints of what is technologically feasible, the systems must be programmed to accept damage to animals or property in a conflict if this means that personal injury can be prevented.

Rule 9: In the event of unavoidable accident situations, any distinction based on personal features (age, gender, physical or mental constitution) is strictly prohibited. It is also prohibited to offset

[51] Cantrell, D. (2019) AI in Healthcare - Things to know! https://www.linkedin.com/pulse/ai-healthcare-things-know-dee-cantrell (September 3, 2019)

[52] Brown, M. (2018) A Healthy Future for Artificial Intelligence in Healthcare. Engineering. https://www.engineering.com/DesignerEdge/DesignerEdgeArticles/ArticleID/17664/A-Healthy-Future-for-Artificial-Intelligence-in-Healthcare.aspx (September 3, 2019)

victims against one another. General programming to reduce the number of personal injuries may be justifiable. Those parties involved in the generation of mobility risks must not sacrifice non-involved parties.[53]

These rules maybe the best represented and shown by "Moral Machine" a research by Edmond Award, Sohan Dsouza and other researchers that designed "Moral Machine" a multilingual online 'serious game' for collecting large-scale data on how citizens would want autonomous vehicles to solve moral dilemmas in the context of unavoidable accidents. The Moral Machine attracted worldwide attention, and allowed us to collect 39.61million decisions from 233 countries, dependencies, or territories.[54]

Figure 2 : Coverage and interface

Source: https://www.secureworldexpo.com/industry-news/self-driving-cars-ethics-pros-cons
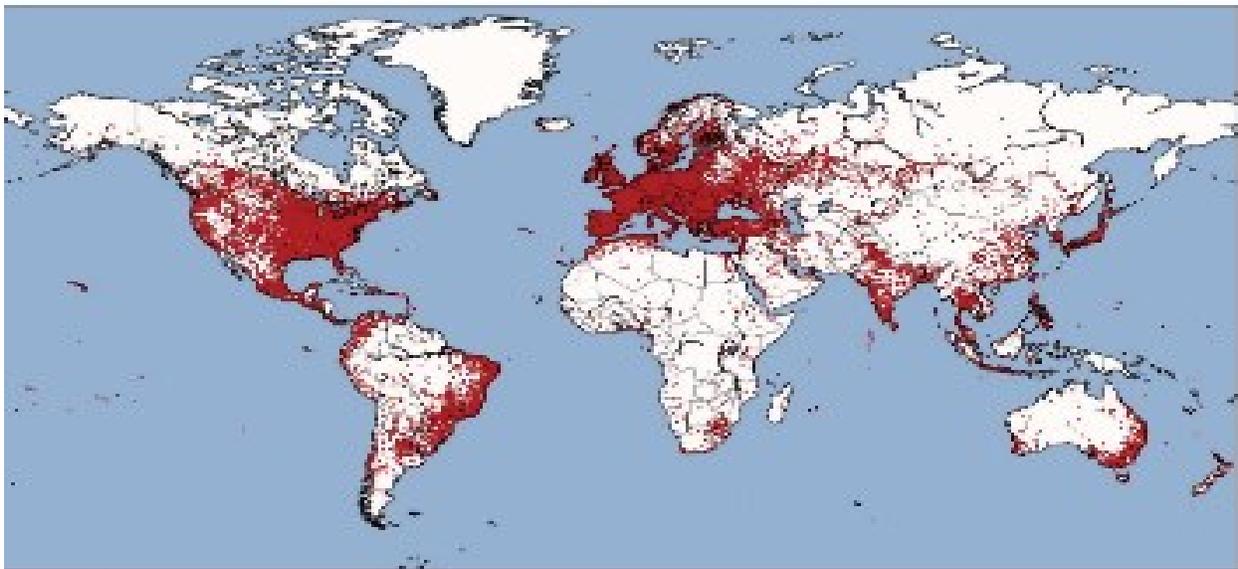
On figure 1 we can see painted in red countries and territories that were involved in this research.

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[53] Fabio, U.D. et al. (2017) ETHICS COMMISSION AUTOMATED AND CONNECTED DRIVING . Federal Ministry of Transport and Digital Infrastructure. Germany. (September 3, 2019) https://www.bmvi.de/SharedDocs/EN/publications/report-ethics-commission.pdf?__blob=publicationFile (September 3, 2019)

[54] Awad, E. et al. (2018) The Moral Machine experiment. Spring Nature Limited. Vol 563 . Nature . pg.59-63 https://www.researchgate.net/publication/328491510_The_Moral_Machine_Experiment (September 4, 2019)

In Figure 2 we can see dilemma of an autonomous vehicle experiences a sudden brake failure. Staying on course would result in the death of two elderly men and an elderly woman who are crossing on a 'do not cross' signal (left). Swerving would result in the death of three passengers: an adult man, an adult woman, and a boy (right)

**Figure 3 : Moral Machine interface**

Source: https://www.secureworldexpo.com/industry-news/self-driving-cars-ethics-pros-cons
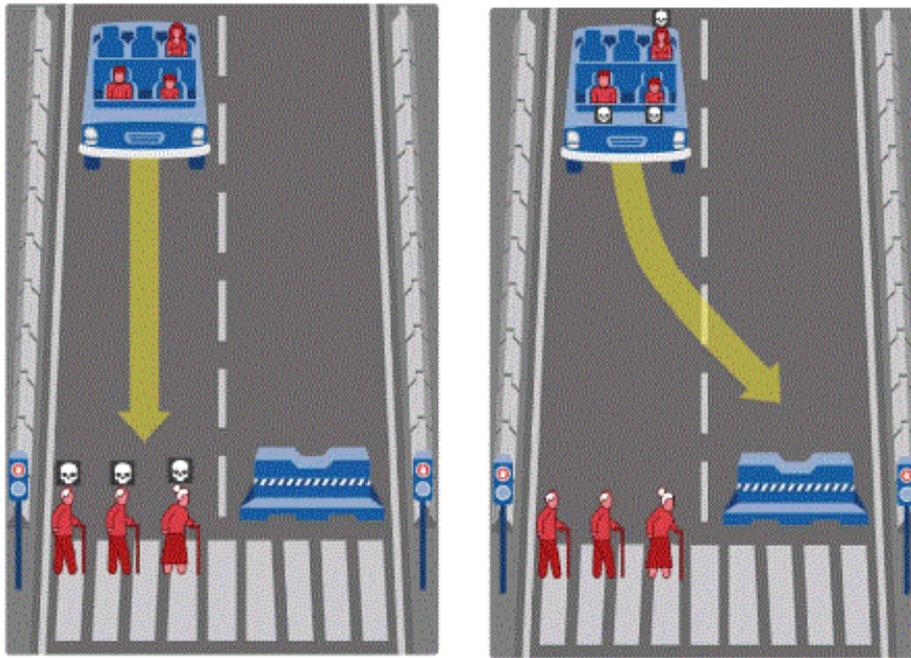
In the main interface of the Moral Machine, users are shown unavoidable accident scenarios with two possible outcomes, depending on whether the autonomous vehicle swerves or stays on course. They then click on the outcome that they find preferable. Accident scenarios are generated by the Moral Machine following an exploration strategy that focuses on nine factors: sparing humans (versus pets), staying on course (versus swerving), sparing passengers (versus pedestrians), sparing more lives (versus fewer lives), sparing men (versus women), sparing the young (versus the elderly), sparing pedestrians who cross legally (versus jaywalking), sparing the fit (versus the less fit), and sparing those with higher social status (versus lower social status). Additional characters were included in some scenarios (for example, criminals, pregnant women or doctors), who were not linked to any of these nine factors. These characters mostly served to make scenarios less repetitive for the users. After completing a 13-accident session, participants

could complete a survey that collected, among other variables, demographic information such as gender, age, income, and education, as well as religious and political attitudes. Participants were geo-located so that their coordinates could be used in a clustering analysis that sought to identify groups of countries or territories with homogeneous vectors of moral preferences. The results showed that the strongest preferences are observed for sparing humans over animals, sparing more lives, and sparing young lives. Accordingly, these three preferences may be considered essential building blocks for machine ethics, or at least essential topics to be considered by policymakers.[55]

Figure 4: Results of Research
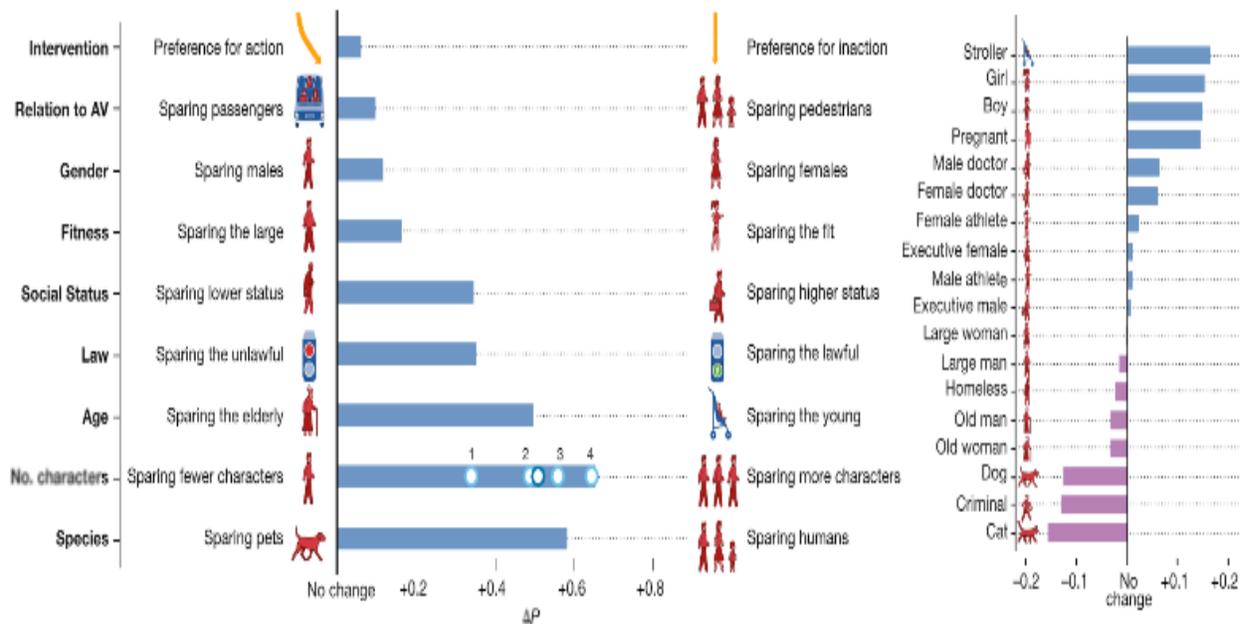
Source : Awad, E. Article, Research article . 2018 Springer Nature Limited (04.September.2019)

As you can see, data, AI, autonomous vehicles and other technologies provide us with fabulous opportunities to create and support thriving communities. However, they also create significant new challenges. A detailed understanding, active debate and real community engagement, will be critical to us successfully leveraging these technologies into our daily lives. Without this, trust will not be achieved, or will be broken, which will impact on the speed and effectiveness of incorporating.

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[55] Awad, E. et al. (2018) The Moral Machine experiment. Spring Nature Limited. Vol 563 . Nature . pg.59-63
https://www.researchgate.net/publication/328491510_The_Moral_Machine_Experiment (September 4, 2019)

4.3.   Ethical Questions Regarding Employment

Social robots are fascinating and amazing. Even robots not as socially advanced, such as 'factory worker' robots that are programmed to learn the same skills as humans are impressive. The most famous social robot is Sophia the first human-like robot, created by Hanson Robotics by combining innovations in science, engineering and artistry. Sophia is the first human-like robot to be given citizenship of one country. Since October 2017 Sophia is citizen of South Arabia.

 The era we live in is one where a robot such as Sophia is given citizenship in Saudi Arabia and factory worker robots are replacing humans and obtaining employee status with a salary and all. Artificial Intelligence put unprecedented power in the hands of organizations to pursue data-based human capital decisions. They also have the potential to democratize feedback, giving millions of job candidate's data-driven insights on their strengths, development needs, and potential career and organizational fit. Whilst this is pretty amazing, you have to admit it's kind of terrifying too. There have been a lot of concerns surrounding the AI developments in recent years. Artificial Intelligence is moving out from the sci-fi genre into the real world. The most important issue is ethics the issue of robot ethics. Ethics from an overall social perspective but also ethics that surround individual robots.[56] The first and most obvious problem is unemployment. So what happens when robots can take over so many human jobs that people are left unemployed and unable to support their families? Will there be new jobs created for humans? What happens when the robots learn everything they need to know? Maybe society will change completely into an era where people can survive from working within their communities and with their family. Or maybe humans will simply have to find other jobs.[57] To those questions we can only have answered if we can see in the future, in the future where jobs are done by robots and people will be thankful because of that. The second problem is inequality. If most jobs are distributed amongst AI instead of humans, will revenue be appointed for fewer people? Won't only tech companies and AI specialists reap all the benefits? If we're looking at a post-work society, how do we structure a fair post-labor economy? The next big ethical question is humanity. More and more robots that are being built today can hold proper conversations. They

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[56]All the Ethical Questions Surrounding AI and Robot Employees (2017) (September 4, 2019) https://www.peoplebank.com.au/blog/2017/11/all-the-ethical-questions-surrounding-ai-and-robot-employees
[57] All the Ethical Questions Surrounding AI and Robot Employees (2017) (September 4, 2019) https://www.peoplebank.com.au/blog/2017/11/all-the-ethical-questions-surrounding-ai-and-robot-employees

utilize almost simple technology that is often used on the internet to draw people's attention. They have an ability to develop relationships with other robots and humans based on information they continuously learn and from information they have easy access to (WIFI connections to clouds of knowledge). If we can have proper conversations and interact in human ways with robots, what does this mean for society? Can robots be programmed to manipulate people? Can robots and humans work together cohesively? Can we use socially advanced robots to help enhance company culture?[58]

Artificial error: Robots are amazing and can be near perfect, but they aren't always completely defecting free. There is always the possibility of Artificial Intelligence not being so intelligent. When met with unknown situations robots will likely make mistakes. Depending what kind of work a robot is responsible for that mistake could be small or it could be severe. So, the question is who takes responsibility for a robot's errors? Is it the company that it works for or the company that constructed and programmed the robot (if those companies are separate)? Is it the person from whom the robot learned from? What happens to the robot after it has made a severe error? What policies will be in place to make sure the same mistake isn't repeated?[59] The answer to this question brings up the idea of robot consciousness, how will robots learn what is right or wrong when in some situations even the humans don't know the difference.

Artificial Intelligence bias Can robot be racist, or sexist or ageist? Robots are often trained in certain ways and can come accustomed to many faces but what if the creator missed the mark and left out too many minorities, does this cause the AI to be biased? How can we get around this and enforce fair training? If robots are created to strive for social progress on the other hand this might never be a problem. This is another matter of trusting in the creator. The examples of AI acting racist can be find in the United States Police crime prevention AI system known as "Correctional Offender Management Profiling for Alternative Sanctions" – COMPAS for short The COMPAS system is used in parts of the US to predict whether defendants will commit crime again. The idea is that COMPAS can help judges to determine whether somebody should be

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[58] All the Ethical Questions Surrounding AI and Robot Employees (2017)
https://www.peoplebank.com.au/blog/2017/11/all-the-ethical-questions-surrounding-ai-and-robot-employees
(September 4, 2019)
[59] All the Ethical Questions Surrounding AI and Robot Employees (2017)
https://www.peoplebank.com.au/blog/2017/11/all-the-ethical-questions-surrounding-ai-and-robot-employees
(September 4, 2019)

allowed to go on probation (supervision outside prison). The COMPAS system does not use racial origin or skin color as an input. But research by Angwin et al., investigative journalists at ProPublica, showed in 2016 that COMPAS is "biased against blacks." ProPublica summarizes: COMPAS (…) correctly predicts recidivism 61% of the time. But blacks are almost twice as likely as whites to be labeled a higher risk but not actually reoffend. It makes the opposite mistake among whites: They are much more likely than blacks to be labeled lower risk but go on to commit other crimes. Moreover, "Black defendants were also twice as likely as white defendants to be misclassified as being a higher risk of violent recidivism. And white violent recidivists were 63% more likely to have been misclassified as a low risk of violent recidivism, compared with black violent recidivists."[60]

Figure 5 : Socially advanced robot

Source: https://www.peoplebank.com.au/blog/2017/11/all-the-ethical-questions-surrounding-ai-and-robot-employees

Many of this worries can be seen throught example of Amazon Artificali powered stores called Amazon GO. Amazon GO is the new kind of the store where you enter with your Amazon Go app, take the products and go. But how it works? When you arrive, use the app to enter the store, then feel free to put your phone away—you don't need it to shop. Then just browse and shop like you would at any other store. Once you're done shopping, you're on your way. No lines, no

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[60]Borgesius, F.Z. (2018) Discrimination, artificial intelligence, and algorithmic decision-making. Directorate General of Democracy Council of Europe. Strasbourg. (September 5, 2019)
http://www.intgovforum.org/multilingual/sites/default/files/webform/eng-study_on_artificial_intelligence.pdf

checkout. The checkout-free shopping experience is made possible by the same types of technologies used in self-driving cars: computer vision, sensor fusion, and deep learning. Just Walk Out Technology automatically detects when products are taken from or returned to the shelves and keeps track of them in a virtual cart. When done shopping, consumers can leave the store. A little later, they will recive receipt and charge you on your Amazon account.[61] Introduced like that Amazon Go looks like future but what about ethic questions, what if all big retailers adopt this technology how many people would lose their jobs,or what about social impact there are people who see their shopping time as a social activity. For some elder citizens, for example, chatting with another human at the till might be the only time in their lonely day they interact with another human being.[62] Also self-checkout cashir can have Artificial error we don't have to go as far as US and Amazon Go to find examples for that one in the Croatian retail supermarket Konzum there are self-checkout cashier, but on many occasions you can only hear "unexpected item in the bagging area". In conclusion, AI offers many exciting possibilities to improve our society. But AI decision-making also brings risks – it is often opaque and can have discriminatory effects, for instance, when an AI system learns from data reflecting biased human decisions. In the public and the private sector, organizations can take AI-driven decisions with far-reaching effects for people. Public sector bodies can use AI for predictive policing or sentencing recommendations and for decisions on, for instance, pensions, housing assistance or unemployment benefits. The private sector can also take AI decisions with major consequences for people, such as decisions regarding employment, housing or credit. Moreover, many small decisions, taken together, can have large effects. The most relevant legal instruments to mitigate the risks of AI-driven discrimination are non-discrimination law and data protection law. If effectively enforced, both legal instruments could help to fight illegal discrimination. Council of Europe member States, human rights monitoring bodies, such as the European Commission against Racism and Intolerance, and Equality Bodies should aim for better enforcement of current non-discrimination norms. We need sector-specific rules, because different values are at stake, and different problems arise, in different sectors. More debate and interdisciplinary research are

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[61] Amazon GO : https://www.amazon.com/b?ie=UTF8&node=16008589011 (September 5, 2019)

[62] Leslie, D. (2019). Understanding artificial intelligence ethics and safety: A guide for the responsible design and implementation of AI systems in the public sector. The Alan Turing Institute. https://doi.org/10.5281/zenodo.3240529 (September 5, 2019)

needed. If we make the right choices now, we can enjoy the many benefits of AI, while minimizing the risks of unfair discrimination.[63]

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[63] Borgesius, F.Z. (2018) Discrimination, artificial intelligence, and algorithmic decision-making. Directorate General of Democracy Council of Europe. Strasbourg.
http://www.intgovforum.org/multilingual/sites/default/files/webform/eng-study_on_artificial_intelligence.pdf
(September 5, 2019)

5. FUTURE SOLUTIONS

5.1.   Emotional Artificial Intelligence

Intelligence and emotions differentiate humans from animals. Emotion is part of a person's behavior and certain feelings can affect his/her performance, emotions can even prevent a person from producing an intelligent outcome. Therefore, when a computer aims to emulate human behavior, not only should this computer think and reason, but it should also be able to show emotions.[64] There is no universal consensus on the definition of emotion. Hence, various authors have different opinions on what emotions are. For instance, Lucia Păiş. Viewed emotion as a fundamental aspect of a human being that motivates actions and enriches experiences. Laurie is of the opinion that emotions are series of body state changes that are connected to mental images that have activated a given brain subsystem. Laurier also defined emotions as an intense mental state that arouses the nervous system and invokes physiological responses. In addition, Russell defines emotion as an immediate affective response to the evaluation of some events (or other stimuli) as being of major significance. Emotions usually arise in response to either an internal or external event which has a positive or negative meaning to an individual. There are two major types of emotions. These include the primary and secondary emotions. Primary emotions, also called basic emotions, are emotions that can be felt by humans as well as animals, while secondary emotions such as disappointment, embarrassment and curiosity are particular to humans. There are however six types of basic emotions. These include happiness, anger, fear, sadness, disgust, and surprise.[65] Other forms of emotions such as rage and terror, interest, contempt, panic, anxiety, joy are varieties of the basic emotions. Emotions can be conveyed through verbal and non-verbal channels. The verbal means of expressing emotions typically involves the use of language or speech; while facial expressions, body movements and postures are examples of non-verbal means of expressing emotions. Intelligence according to Wechsler is

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[64]Martinez-Miranda, J.; Aldea, A. (2005) Computers in Human Behavior.
https://www.researchgate.net/publication/223412092_Emotions_in_human_and_artificial_intelligence
(September 6, 2019)

[65] Olaronke, I. Rhoda, I. (2017) A Systematic Review of Emotional Intelligence in Social Robots. LCU, Ibadan, Nigeria
https://www.researchgate.net/publication/323119460_A_systematic_review_of_emotional_intelligence_in_social_robots (September 6, 2019)

the aggregate or global capacity of an individual to act purposefully, think rationally and deal effectively with his environment. There are however diverse definitions for the term emotional intelligence. Emotional intelligence according to Salovey is the ability to perceive, express, understand, use and manage emotions for the well-being of human beings. Bar-On broadly defined emotional intelligence as an array of non-cognitive capabilities, competencies, and skills that influence one's ability to succeed in coping with environmental demands and pressures. According to Patil, emotional intelligence deals with the ability to understand, manage, and express one's feelings and also manage the feelings of others. Mayer also views emotional intelligence as the ability to engage in sophisticated information processing about one's own emotions as well as other people's emotions and the ability to use this information as a guide to thinking and behaving.[66] From the definitions stated above, emotional intelligence can be defined as the ability of an individual to recognize and control his emotions and the ability to act intelligently with others. Mayer and Salovey developed a four branch model of Emotional Intelligence. Each of the branches in the model describes the set of skills that make up an overall emotional intelligence. Emotional intelligence in social robots according Gockley is the ability of social robots to display emotions like humans do. Another definition of emotional intelligence in social robots was given by Kwon. Kwon views emotional intelligence in social robots as the creation of robots that internally simulate the native or learned social behavior and intelligence of living creatures. The branch of Computer Science that deals with emotional intelligence in social robots is called Affective Computing. Affective Computing according to Picard is the creation of a machine that is able to understand the emotions of a user and adapt its behavior according to them. Hence, Picard emphasized that the main aim of affective computing is to build machines that recognize, express, model, communicate and respond to users' emotions.[67] There are quite a number of social robots that exhibit emotional intelligence. Typical examples of these social robots include Kismet, iCat, Leonardo, Daryl amongst others.

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[66] Olaronke, I. Rhoda, I. (2017) A Systematic Review of Emotional Intelligence in Social Robots. LCU, Ibadan, Nigeria
https://www.researchgate.net/publication/323119460_A_systematic_review_of_emotional_intelligence_in_social_robots (September 6, 2019)
[67] Olaronke, I. Rhoda, I. (2017) A Systematic Review of Emotional Intelligence in Social Robots. LCU, Ibadan, Nigeria (07.September.2019)
https://www.researchgate.net/publication/323119460_A_systematic_review_of_emotional_intelligence_in_social_robots (September 6, 2019)

Leonardo is a 2.5 feet social robot developed by Personal Robot Group at the Massachusetts Institute of Technology Media Laboratory to interact with people, memorize their faces and recognize them through a camera mounted in its right eye Hence, Leonardo was developed to facilitate human-robot interaction by encouraging humans to interact with it the same way they interact with a child or a pet. Leonardo according to Berlin has a torso with operating arms and hands with which it performs tasks such as pressing a button or assembling blocks. Leonardo is the most expressive social robot that is capable of expressing human like emotions. Leonardo expresses the nine basic facial expressions expressed by Kismet. According to Lucia Păiş,, Leonardo has a sense of touch through which it expresses the pleasure of hugs or pain when tightened too much.[68]

**Figure 6: Leonardo**

Source: https://robots.ieee.org/robots/leonardo/

The Roboceptionist robot is a social robot that is developed as a platform for social robotics research. The roboceptionist robot is located in a booth near a high-traffic entrance to a computer science building at Carnegie Mellon University. This robot allows human beings to interact with it through the keyboard and it provides a visual feedback through a monitor. The roboceptionist robot has a Liquid Crystal Display (LCD) head through which it displays its

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[68] Olaronke, I. Rhoda, I. (2017) A Systematic Review of Emotional Intelligence in Social Robots. LCU, Ibadan, Nigeria
https://www.researchgate.net/publication/323119460_A_systematic_review_of_emotional_intelligence_in_social_robots (September 6, 2019)

emotions. This robot displays emotions when there is an interaction with human beings. For instance, the robot expresses happiness when a new person interacts with it. However, it displays sadness or anger when insults are hurled at it.[69]

Figure 7 : The roboceptionist robot emotional expressions
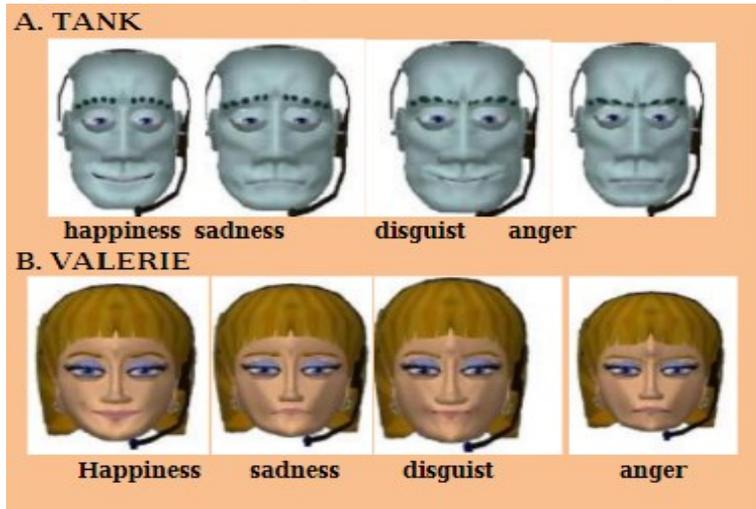
Source:

There are quite a number of benefits of designing social robots with emotional intelligence.

1. Social robots that are able to recognize and understand their own emotions as well as the emotions of humans are less frustrating to deal with. Hence, Hamilton is of the opinion that a social robot with emotional intelligence can modify its own behavior to be more accommodating. This however facilitates a natural cooperation between social robots and human beings.

2. Relevant information and social intentions can be obtained through emotions such as body postures, movements, gestures, facial and vocal expressions of social robots with emotional intelligence.

3. Emotional intelligence in social robots facilitates interaction between humans and robots. This helps robots to perform their tasks effectively.

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[69] Olaronke, I. Rhoda, I. (2017) A Systematic Review of Emotional Intelligence in Social Robots. LCU, Ibadan, Nigeria
https://www.researchgate.net/publication/323119460_A_systematic_review_of_emotional_intelligence_in_social_robots (September 6, 2019)

4. Emotional intelligence improves the autonomy with which social robots perform their tasks when compared to social robots without emotional intelligence.

5. Kwon emphasized that emotions in social robots can act as a control mechanism which drives the behavior of the robot and reflects how the robot is affected and adapts to different factors.[70]

The innovations in computer technology and artificial intelligence have led to the advancements in robotic technology in almost all spheres of life. The development of robots with human emotions have many benefits but also raises many ethical questions which can't be given by simple answer or algorithm, the development of ethics is the key of success for the future of the emotionally intelligent robots.

5.2. *Chatbots*

Humans are constantly fascinated with auto-operating AI-driven gadgets. The latest trend that is catching the eye of the majority of the tech industry is chatbots. And with so much research and advancement in the field, the programming is winding up more human-like, on top of being automated. The blend of immediate response reaction and consistent connectivity makes them an engaging change to the web applications trend.[71] Online chatbots save time and efforts by automating customer support. Gartner forecasts that by 2020, over 85% of customer interactions will be handled without a human. However, the opportunities provided by chatbot systems go far beyond giving responses to customers' inquiries. They are also used for other business tasks, like collecting information about users, helping to organize meetings and reducing overhead costs. There is no wonder that the size of the chatbot market is growing exponentially.[72] According to Oxford Dictionaries, a chatbot is: "A computer program designed to simulate conversation with

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[70] Olaronke, I. Rhoda, I. (2017) A Systematic Review of Emotional Intelligence in Social Robots. LCU, Ibadan, Nigeria
https://www.researchgate.net/publication/323119460_A_systematic_review_of_emotional_intelligence_in_social_robots (September 6, 2019)
[71]Elupula, V. (2019) How do chatbots work? An overview of the architecture of chatbots. Bigdata made simple .
https://bigdata-madesimple.com/how-do-chatbots-work-an-overview-of-the-architecture-of-a-chatbot/ (September 7, 2019)
[72] Anadea (2018) What is a Chatbot and How to Use It for Your Business. TheStartup. Medium.
https://medium.com/swlh/what-is-a-chatbot-and-how-to-use-it-for-your-business-976ec2e0a99f (September 7, 2019)

human users, especially over the Internet."[73] In general terms, a bot is nothing but software that will perform automatic tasks. In other terms, a bot is a computer program that is designed to communicate with human users through the internet. This article will focus on the class of bots that live on chat platforms and websites, i.e. chatbots. The most natural definition of a chatbot is – a developed a program that can have a discussion/conversation with a human. For example, any user could ask the bot an inquiry or a statement, and the bot will respond or perform an activity as appropriate. A chatbot interacts on a format similar to instant messaging. By artificially replicating the patterns of human interactions in machine learning allows computers to learn by them without programming natural language processing. While a bot is a computer's ability to understand human speech or text short for chat robot. A chatbot is merely a computer program that fundamentally simulates human conversations. It allows a form of interaction between a human and a machine the communication, which happens via messages or voice command.

A chatbot is programmed to work independently from a human operator. It can answer questions formulated to it in natural language and respond like a real person. It provides responses based on a combination of predefined scripts and machine learning applications.[74]

Why does a business need chatbots? There are reasons for that like getting rid of routine tasks and simultaneous processing of multiple requests from users. Besides, a tremendous speed of processing users' requests with chatbots helps gaining customers' loyalty.

Consumers also benefit from chatbots and they are getting increasingly interested in this technology. A study presented at the 4th International Conference on Internet Science in November, 2017 identified reasons why people choose to interact with chatbots. According to this research, the main factors that motivate people to use chatbots are:

- **Productivity.** Chatbots provide the assistance or access to information quickly and efficiently.

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[73] Nuseibeh, R (2018). What is a Chatbot? Chatbotsmagazine. https://chatbotsmagazine.com/what-is-a-chatbot-6dfff005bb34 (September 7, 2019)

[74] Elupula, V. (2019) How do chatbots work? An overview of the architecture of chatbots. Bigdata made simple . https://bigdata-madesimple.com/how-do-chatbots-work-an-overview-of-the-architecture-of-a-chatbot/ (September 7, 2019)

- **Entertainment.** Chatbots amuse people by giving them funny tips; they also help killing time when users have nothing to do.

- **Social and relational factors.** Chatbots fuel conversions and enhance social experiences. Chatting with bots also helps to avoid loneliness, gives a chance to talk without being judged and improves conversational skills.

- **Curiosity.** The novelty of chatbots sparks curiosity. People want to explore their abilities and to try something new.[75]

Depending on how the specific bots were programmed, we can divide them into two large groups: working according to pre-prepared commands (simple chatbot) and trained (smart or advanced chatbot).

Simple chatbots work based on pre-written keywords that they understand. Each of these commands must be written by the developer separately using regular expressions or other forms of string analysis. If the user has asked a question without using a single keyword, the robot cannot understand it and, as a rule, responds with messages like "sorry, I did not understand".

Smart chatbots rely on artificial intelligence when they communicate with users. Instead of pre-prepared answers, the robot responds with adequate suggestions on the topic. In addition, all the words said by the customers are recorded for later processing.[76]

Both startups and savvy companies are now incorporating interactive agents into their daily operations, communication with customers and sales processes. Chatbots can help to:

Improve customer service. It is the best option for those who don't want their customers to:

Wait for operator's answer — "Stay on the line, your call is very important to us" is always annoying, isn't it?

Search for an answer in the FAQ — as rule users don't have time for scrolling dozens of pages with instructions.

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[75] Anadea (2018) What is a Chatbot and How to Use It for Your Business. TheStartup. Medium. https://medium.com/swlh/what-is-a-chatbot-and-how-to-use-it-for-your-business-976ec2e0a99f (September 8, 2019)
[76] Anadea (2018) What is a Chatbot and How to Use It for Your Business. TheStartup. Medium. (September 8, 2019)https://medium.com/swlh/what-is-a-chatbot-and-how-to-use-it-for-your-business-976ec2e0a99f

Streamline the shopping process. It only takes to write what you want to the chatbot and the bot will send the information to the sales department. You don't need to repeat several times "I need the same, but with metal buttons". Besides, the chatbot remembers your preferences and uses this information when you return.

Personalize communication. A chatbot answers the specific questions of visitors instead of displaying a long list of information. The more attention a customer gets the greater his desire to buy something.

Improve a response rate. About 90% of questions sent from Facebook business pages remain unanswered. Chatbot responds to 100% of messages and converts more visitors into buyers.

Automate repetitive tasks. Most customers want to get answers on the same questions — when do you work? What is your location? Do you make deliveries? In order not to write the same answers every time, make a chatbot. It reduces your employees' workload.[77]

Many business owners are just beginning to understand what benefits chatbots can bring to them. This technology is still in an early stage; its capabilities continue increasing and the best chatbots have yet to be created.

[77] De, A. (2018) A Look at the Future of Chatbots in Customer Service. Readwrite.
https://readwrite.com/2018/12/04/a-look-at-the-future-of-chatbots-in-customer-service/(September 8, 2019)

6. CONCLUSION

Artificial Intelligence is idea that machines could think, feel and perform tasks like humans. That idea is not new; it has been around for thousands of years. Even the ancient Greek Aristotle had the idea of "dualism". The first appearance of the word Artificial Intelligence was by John McCarthy the "father of Artificial Intelligence" at a conference at Dartmouth College. Over the years Artificial Intelligence grows, technologically advanced and with that AI got more attention and investments from governments which increased already fast development of that new technology. But with all that is happening the people started to ask ethical questions regarding AI. People understood that AI is becoming their reality, but at the time they didn't understand what AI is and what people don't understand is what they fear. So the new branch of AI started to develop the ethics of Artificial Intelligence. Ethic by definition is moral principles governing the behavior or actions of an individual or a group. But one definition is not enough to define ethics in different cultures see ethics in different ways. With development of more intelligent robots which were destined to replace people, people felt frighten because one thing that keeps humans on top of food chain is our intelligent but what if someone or something is smarter than us? So the moral codes were created, codes that would stop robots to turn against us codes that would tell robots how to behave. But even with all that codes Singularity would overthrow it. Singularity is idea that AI would understand its design at such an extent that it could redesign itself overwrite all codes and create new ones. That is called the Artificial Super Intelligence or (ASI). ASI will create an unprecedented ethical challenge if AI becomes so advanced that humanity undergoes a dramatic and irreversible change. So the new ethical, moral codes were created for "moral singularity" a particular system of values and principles of conduct – will evolve radically once human intelligence and cognition is enhanced, and when artificial general intelligence (AGI) enters the world. An increase in ethical and moral values is fundamental part of and intelligence singularity. If we increase our ability to accurately prioritize efforts and morality, it will create a cyclical process with positive push forward. An ethical cascade positive feedback loop will produce an intelligence singularity. With development of more and more advanced robots and robots becoming our reality the question occurred should robots have legal rights? If they behave like a human act like human should they have human rights? So the term "electronic person" occurred combination of both a legal subject and legal objects. The future in

ethics regarding AI is still hazy; on one side AI can have and already have a positive impact on everyday society in terms of helping people in everyday chores. But AI is not without flaws there is more than one example in which AI act racist or discriminate. All of this makes ethical future blurry, but with positive connotation because, like people AI is still growing and developing. The example of real life AI can be found in medicine, AI and healthcare share well established past, this is supported by the fact that one of the first AIs was in health care. Today Healthcare-based Artificial intelligence systems are some of the well-funded initiative's in the technology sector. Artificial Intelligence has many uses in healthcare from diagnosing diseases to performing operations, but what if AI got something wrong who to blame? That question is just one of many Ethical questions regarding AI in healthcare, even though AI showed that he can be very useful there are still grey zones surrounding him. Another example of usage of AI can be seen through Car Industry which is one of the most popular ethical questions today. Today, more and more inventions are made on developing autonomous cars. Cars that would revolutionize the car industry also they would make everyday life easier. There would be no more traffic jams people would not spend unnecessarily much time traveling the elder people and children could go alone to their destinations set up like that it sound like there is no negative side of autonomous future but there is. How could car decide in an inevitable situation, who to kill? When even people in some situations don't make ethically correct decisions. Edmond Award and his team created "moral machine" they survey more than 39.61 million people from 233 countries what would they do if they are found in one of the inevitable situations and like we sad on beginning on conclusion ethics are not same for everyone and this research showed that. They were given moral dilemma with many factors and there didn't give a single answer rather, each respondent had his or her own theory of ethics. So how can we teach autonomous car the right decision when even we don't know what is right. The last example in this seminar is regarding employment. What happens when robots took over our jobs? When people become unemployed? Can humanity overcome and adapt to that? Answers to these questions will indicate the future. Amazon go example shows us that artificial intelligence stores are the future of our society, but even this example raises ethical questions because there is no perfect technology what if something goes wrong in the store if sensors start to show wrong. Technology even great and tempting raise many ethical questions, questions that humans can't answer yet, maybe because they are trying to create something that is even smarter than herself.

What are the future solutions for Artificial Intelligence?

One of them is definitely emotional AI the robot that can show 9 basic human emotions. With the invention of emotional robot people will lose that aversion to robots because they look and act cold. They will be able to connect with them at a deeper level than just a business one. The most expressive social robot Leonardo is designed in that way that encourages humans to interact with it the same way they interact with a child or pet. Leonardo has a sense of touch through which it expresses the pleasure of hugs or pain when tightened too much. The emotional robot will bring people closer to thinking that robots are like humans.

The second solution proposed is Chatbot. The blend of immediate response reaction and consistent connectivity makes them an engaging change in the web applications trend. They are so popular among companies that there is forecast by 2020 over 85% of customer interactions will be held without a human. A chatbot interacts on a format similar to instant messaging. By artificially replicating the patterns of human interactions in machine learning allows computers to learn by them without programming natural language processing. Why does a business need chatbots? A tremendous speed of processing users' requests with chatbots helps gaining customers' loyalty.

To sum up the artificial intelligence is the inimitable future of human society. Even today it plays a major role in everyday life. The final thought is that the ethics of AI will be like us, it will make mistakes, which is not why they are built for but it is what will give them the human line. And so like we they will also develop through time.

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