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Sofia Alcaide

Human rights and ethical dilemmas in the use of autonomous vehicles

About this Research Paper Series

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Sofia Alcaide
Doctoral student at the School of Law of the University of Minho. Júnior Researcher of JusGov - Centre for Research in Justice and Governance. Lawyer.

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Abstract: In recent years we have witnessed a rapid development of artificial intelligence, which is applied to a multitude of occasions and technologies. The benefits of this technological innovation are undeniable: it can help us in decision making, it interprets our tastes and preferences and adjusts the results accordingly when we search for a certain good or object in digital search engines, and now it assists the task of driving, evolving to a level where the existence of a driver may not even be necessary anymore. This will only be possible with highly complex algorithms capable of making decisions and replacing the driver. But how are these algorithms created? Could they in any way affect the fundamental rights or ethical values by which we abide? And by what principles or ethical values should we program the algorithms applicable to autonomous driving? Could or should there be some figure responsible for ensuring that the development, implementation, and use of artificial intelligence, especially in the use of autonomous vehicles, respects fundamental rights and basic ethical principles?

Keywords: Artificial intelligence; autonomous vehicles; ethics; fundamental rights.

1. Introduction

The development of technology always or almost always implies the amendment of legislation or the creation of new legal norms to deal with its innovative implications[1]. In this equation, the rule is usually that the technology is applied in practice, becomes commonly used and only then, after analysing its implications in practical life and the problems that it eventually raises, are the necessary legislative changes made or new legal dispositions produced. A real and current example of this paradigm are cryptocurrencies[2]/[3].

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[1] HIGH-LEVEL EXPERT GROUP ON ARTIFICIAL INTELLIGENCE, «Ethics Guidelines for Trustworthy AI» [Online], april, 2019, p. 8, available at Ethics guidelines for trustworthy AI | Shaping Europe's digital future (europa.eu), consulted on 30/04/2022.

[2] JOANA ALEXANDRA GIRALDES VIEIRA LUZ, «Regulação e Criptomoedas» [Online], Master's Thesis, Lisbon University Law School, Lisbon, 2020, available at https://repositorio.ul.pt/bitstream/10451/48058/1/ulfd146078_tese.pdf, consulted on 30/04/2022.

[3] BANCO DE PORTUGAL, «Ativos Virtuais» [Online], available at https://www.bportugal.pt/page/moedas-virtuais, consulted on 30/04/2022.

Concerns related to the use of autonomous vehicles are heightened by the media, which is mostly concerned with publicising the possible problems of this new technology, as well as the accidents that occur with its use[4], rather than the advantages and benefits it brings, in particular the reduction in the number of accidents and their severity[5]/[6].

Given the popularity and frequency with which autonomous vehicles have been talked about and publicized - almost often for the worst reasons - as well as the fast developments they have been undergoing, there is an urgent need for giving a legal response to the dilemmas they raise, and in particular to those related to respect for fundamental rights and ethical principles.

2. The possible (dis)respect of algorithms for fundamental rights

Autonomous vehicles necessarily involve fundamental rights, such as the right to life, physical integrity, safety, privacy, and cybersecurity[7]. It is necessary to remember that when an individual chooses to use an autonomous vehicle - even if it has a greater or lesser degree of autonomy - he is allowing it to replace him in certain decisions which may, to a greater or lesser extent, influence his fundamental rights or the fundamental rights of others. One of the questions that the use of autonomous vehicles raises on a large scale is whether the ability of the sensors they will be equipped with will be able to correctly collect and interpret the information they obtain, so that the AI (Artificial Intelligence) of the vehicle can make decisions in a sustained manner - consider situations of adverse weather conditions. Some even argue that, under circumstances like these, the vehicle should require the "driver" to take over the driving task[8].

As far as fundamental rights are concerned, Janneke Gerards, Professor of Law in the subject of Fundamental Rights at Utrecht University, has questioned to what extent those can be harmed by algorithms. In her view, algorithms are neither transparent nor neutral, and on the other hand, they are designed, implemented, and controlled by people[9].

Starting with the fact that algorithms are under human monitoring, the author begins by stating that, since algorithms are designed from reason and by the human hand, and the people who design them have particular beliefs, principles, values and even prejudices, it is natural that this will be reflected at the time of the algorithm design, which will be responsible for decision making replacing the driver. This means that algorithms are not neutral, that is, they will reflect, in some way and at some point, the principles, values, beliefs and prejudices of their creator. On the other hand, algorithms, having the ability to collect and interpret data from human activity and behaviour, and learn from it - the so-called machine learning - will also assume biases and principles that will consequently be reflected in the decision-making process[10].

This lack of neutrality invariably leads to a lack of transparency. Many algorithms are complex in size and programming, especially those with machine learning. This is in addition to human-influenced programming, so the

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[4]   Vincent C. Müller, «Ethics of Artificial Intelligence and Robotics» [Online], *The Stanford Encyclopedia of Philosophy*, april, 2020, available at Ethics of Artificial Intelligence and Robotics (Stanford Encyclopedia of Philosophy), consulted on 30/04/2022.

[5]   Jean-François Bonnefon/Azim Shariff/Iyad Rahwan, «The social dilemma of autonomous vehicles» [Online], *Science,* Vol. 352, N.º 6293, June 2016, p. 1573, available at The social dilemma of autonomous vehicles (science.org), consulted on 23/10/2021.

[6]   This and other benefits are discussed in Sofia Patrícia Travassos de Freitas Alcaide, *Civil Liability for damages caused by autonomous vehicles*, Coimbra, Almedina, 2021, available at https://www.almedina.net/a-responsabilidade-civil-por-danos-causados-por-veiculos-autonomos-1635162232.html.

[7]   Plasmed in Jorge Miranda, *Manual de Direito Constitucional - Tomo IV - Direitos Fundamentais*, 9th Edition, Coimbra, Coimbra Editora, 2015.

[8]   Daniel J. Fagnant/Kara Kockelman, «Preparing a nation for autonomous vehicles: emerging responses for safety, liability, privacy, cybersecurity, and industry risks» [Online], *Transportation Research Part A: Policy and Practice*, may, 2015, p. 170, available at https://www.sciencedirect.com/science/article/abs/pii/S0965856415000804, consulted on 30/04/2022.

[9]   Janneke Gerards, *«The Fundamental Rights - Challenges of Algorithms»* [Online], *Netherlands Quarterly of Human Rights*, 2019, Vol 37(3), p. 205, available at The fundamental rights challenges of algorithms (sagepub.com), consulted on 30/04/2022.

[10]   *Idem*, p. 206.

autonomous learning capability will increase the opacity of decision-making processes - opacity that may be difficult for even the experts to see[11].

These characteristics may harm fundamental rights. We can see that we constantly use devices connected to the Internet, which collect our data and generate other data, which can be accessed and analysed, either by companies or by the State itself. The same goes for facial recognition technologies or even cameras placed in public places for security purposes. This directly influences our privacy. This awareness of the collection of our personal data, and even of our behavioural analysis, will affect our behaviour. On the other hand, our freedom of speech may also be affected. Since search engines are able to analyse our preferences according to our searches and then tailor the results, this means that we may be accessing limited and manipulated information[12].

There are also two other principles, or fundamental rights, which are likely to be violated and which are identified by other studies, especially the one carried out by the European Union Agency for Fundamental Rights (FRA)[13]. One is the principle/right to non-discrimination. Algorithms can be used, for example, for the purpose of hiring employees. If, in this case, the performance of positions of responsibility or management is defined as an essential characteristic for the recruitment process, and we know that for decades such positions have been almost exclusively male-occupied, then we are of course introducing a discriminatory factor. This example, and others like it, may lead to the rejection of the algorithms and their results[14]. At the same time, in an analysis carried out by the Executive Director of the FRA about the FRA report, Oreste Pollicino, Professor of Constitutional Law, concludes that technologies with artificial intelligence have increased the number of discriminatory results. This is because algorithms are essentially created and developed to analyse data, to profile, to classify behaviour. But again, since these algorithms are created by humans, the processes they perform are invariably influenced by the programmers' beliefs and prejudices, and it is very necessary to ensure respect for the principle of non-discrimination and, consequently, respect for the principle of human dignity[15].

Still, it is established as fundamental respect for access to justice[16] or by fundamental procedural rights[17]. This is because algorithms within the justice system can be used to assist in decision making, for example through processes of evidence analysis or the probability of repeat offending, for example[18]. However, it can happen that algorithms created for these functions have underlying old sentences, which are naturally subjective, probably endowed with personal considerations, and even outdated. In addition, it is the right of all parties to know the reasoning behind the decision, that is, to know the algorithm's reasoning[19], which, as we have seen, may not be easy. Effective access to justice also presupposes the right to a fair trial and an effective appeal of the decision, so states should be obliged to guarantee the right to bring a dispute before a court or other alternative body. This could mean that if a subject appeals against a decision that was based on the use of algorithms, it should be ensured that the appeal will not use the same algorithm, i.e. that there will actually be further analysis of the evidence[20].

These are some of the issues that experts place around artificial intelligence algorithms, across the board. However, autonomous vehicles raise other issues besides these, which will also require analysis and resolution.

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[11] *Ibidem.*

[12] *Idem*, pp. 206-207.

[13] European Union Agency for Fundamental Rights, «*Getting the future right - Artificial Intelligence and Fundamental Rights*» [Online], 2020, available at Getting the future right - Publications Office of the EU (europa.eu), consulted on 30/04/2022.

[14] Janneke Gerards, «The Fundamental Rights - Challenges of Algorithms», *ob. cit.*, p. 207.

[15] Oreste Pollicino, «*"Getting the Future Right - Artificial Intelligence and Fundamental Rights". A view from the European Union Agency for Fundamental Rights*» [Online], *BioLaw Journal - Rivista di BioDiritto*, N.º 1, 2021, p. 10, available at www.biodiritto.org., consulted on 30/04/2022.

[16] *Idem*, p. 11.

[17] Janneke Gerards, «The Fundamental Rights - Challenges of Algorithms», *ob. cit.*, p. 207.

[18] On these issues, Sónia Moreira, «Artificial Intelligence: Brief considerations regarding the Robot-Judge», in Maria Miguel Carvalho/Sónia Moreira (eds.), *Governance & Technology - E-Tec Yearbook*, 2021, pp. 297-313, available at https://www.jusgov.uminho.pt/publicacoes/etec-yearbook-2021-2/, consulted on 02/05/2022.

[19] Janneke Gerards, «The Fundamental Rights - Challenges of Algorithms», *ob. cit.*, pp. 207-208.

[20] Oreste Pollicino, «*"Getting the Future Right - Artificial Intelligence and Fundamental Rights". A view from the European Union Agency for Fundamental Rights*», *ob. cit.*, p. 11.

3. A first proposal of ethical principles to be respected in the European Union

The concerns about physical integrity and the right to life led the European Commission to propose that this new technology should be equipped with the "Intelligent Speed Adaption (ISA)" system, to comply with the legal speed limits, by applying limiters or warnings to drivers[21]. Issues related to hacking and lack of privacy are also raised, considering the difficult control of the user data, even though in the European Union this is already ensured to some extent by the General Data Protection Regulation[22] - adding to the possible need to create specific legal provisions for the matter related to autonomous vehicles.

It is for this reason and given the unequivocal relevance of fundamental rights and their protection being crucial, that it is considered that the regulation of autonomous vehicles should be prior to allowing their circulation in general and their use by the general population[23]. In this sense, the reference to the mandatory respect for the various texts enshrining fundamental rights has been constant in the various texts of legislative proposals on artificial intelligence, particularly those coming from the European Union, such as the "Proposal for a Regulation of the European Parliament and of the Council laying down Harmonised Rules for Artificial Intelligence Matters (Artificial Intelligence Regulation) and amending certain Union legislative acts", which refers several times, in the explanatory memorandum of the proposal, to the need to guarantee citizens that artificial intelligence is developed in a way that respects fundamental rights[24].

Fundamental rights and ethics are intrinsically linked: we can see that in the document formulated by the Independent High-Level Expert Group on Artificial Intelligence, set up by the European Commission in June 2018, called "Ethical Guidelines for a Trustworthy AI", in addition to stating in point 35 that fundamental rights should underpin artificial intelligence, it is expressly mentioned in point 37 that the ethical approach should be "based on fundamental rights", enshrined in the most diverse European and international legislative texts[25]. In its understanding, fundamental rights make it possible to identify the ethical-moral values by which society is guided, at least in an abstract way[26].

The Independent High Level Expert Group on Artificial Intelligence draws on five fundamental rights, which it considers to be capable of meeting the challenges posed by artificial intelligence, to establish four crucial ethical principles to the development of artificial intelligence[27][28]. The fundamental rights that underlie the ethical principles are briefly the following:

> 1. Respect for human dignity - artificial intelligence systems should be developed in such a way that human value is not diminished, that is, that people are not objectified or manipulated, protecting their mental and physical integrity;

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[21] Dominika Iwan, «Autonomous Vehicles - a New Challenge to Human Rights?» [Online], *Adam Mickiewicz University Law Review*, September 2019, p. 70, available at http://cejsh.icm.edu.pl/cejsh/element/bwmeta1.element.ojs-doi-10_14746_ppuam_2019_9_04, consulted on 19/04/2022.

[22] *Idem*, p. 72.

[23] Dominika Iwan, «Autonomous Vehicles - a New Challenge to Human Rights?», *ob. cit.*, p. 73.

[24] Comissão Europeia, «Proposal for a Regulation of the European Parliament and of the Council - Laying down Harmonised Rules for Artificial Intelligence Matters (Artificial Intelligence Regulation) and amending certain Union legislative acts» [Online], april, 2021, pp. 19-20, 23-24, 26-28, available at https://eur-lex.europa.eu/resource.html?uri=cellar:e0649735-a372-11eb-9585-01aa75ed71a1.0004.02/DOC_1&format=PDF, consulted on 30/04/2022.

[25] Independent High Level Expert Group on Artificial Intelligence, «*Ethical Guidelines for a Trustworthy AI*» [Online], pp. 11-12, available at Orientações éticas para uma IA de confiança - Publications Office of the EU (europa.eu), consulted on 23/10/2021.

[26] *Idem*, p. 12.

[27] *Idem*, pp. 12-16.

[28] Also referred to in point 3.5 of the European Commission's Explanatory Memorandum, «Proposal for a Regulation of the European Parliament and of the Council laying down harmonized rules concerning artificial intelligence matters (Artificial Intelligence Regulation) and amending certain Union legislative acts» [Online], available at https://eur-lex.europa.eu/legal-content/PT/TXT/HTML/?uri=CELEX:52021PC0206&from=EN, consulted on 23/10/2021.

2. Respect for human freedom - aims to guarantee equal access to the advantages of artificial intelligence, while respecting individuals' decision-making capacity and guaranteeing them control over their lives and privacy;

3. Guarantee of democratic processes, respect for justice and the rule of law - which is enshrined by prohibiting artificial intelligence from interfering in democratic processes, guaranteeing individuals' freedom of choice;

4. Prohibition of non-discrimination and guarantee of equality and solidarity rights - the main objective of this fundamental right is the protection of the most fragile groups in society and minorities;

5. Guarantee of different citizens' rights - among which is access to good and sufficient administration, whose improvement may be increased by artificial intelligence systems.

These fundamental rights led to the non-ordered listing of the following ethical principles, considered crucial:

i. Respect for human freedom and autonomy - artificial intelligence should be developed starting from the principle of concentration on human beings and their respect, avoiding any form of their manipulation or coercion, allowing them all possible self-determination and control of AI systems;

ii. "Damage prevention principle" - artificial intelligence systems should be developed particularly with a view to preventing damage, avoiding accidents and risky situations. This goes along with the respect for the dignity of the human person, seeking to guarantee that artificial intelligence systems are not accessible to outsiders, as well as seeking to guarantee the inclusion of the most vulnerable;

iii. Equity - in the sense of non-discrimination, equal opportunities and equal access to artificial intelligence systems, which may serve as a source to promote equality between groups;

iv. "Principle of explainability" or transparency - artificial intelligence processes should be transparent, as well as their purposes and objectives, and it should be possible to access and understand their decision-making mechanisms.

However, even if, based on fundamental rights, it is possible to determine ethical and moral principles that underlie the development of artificial intelligence systems, these will always be abstract, as stated in point 37 of the document formulated by the Independent Expert Group[29].

3.1. The possibility of creating a European Agency to ensure the respect of fundamental rights by artificial intelligence

Without intending to make an extensive analysis of this proposal for the creation of an independent European Agency to guarantee the respect for fundamental rights and ethical principles[30] - which we will certainly do in a near future - it is necessary to refer to such proposal in the present context. The authors of this proposal point out that this should be an independent agency that guarantees the effective practical applicability of all European legislation regarding artificial intelligence. In addition, this agency should be free to make proposals and recommendations to the various bodies of the European Union regarding the regulation of artificial intelligence mechanisms, always promoting the guarantee of human rights. Additionally, this agency should have the responsibility to set limits on the restriction of fundamental rights and control the risk systems of artificial intelligence, monitoring their development and maintenance by those responsible[31].

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[29] Independent High Level Expert Group on Artificial Intelligence, «Ethical Guidelines for a Trustworthy AI», *ob. cit.*, p. 12.

[30] Bernd Carsten Stahl, Rowena Rodrigues, Nicole Santiago, Kevin Macnish, «*A European Agency for Artificial Intelligence: Protecting fundamental rights and ethical values*» [Online], *Computer Law & Security Review,* Vol. 45, 2022, p. 8, available at A European Agency for Artificial Intelligence: Protecting fundamental rights and ethical values - ScienceDirect, consulted on 30/04/2022.

[31] *Idem*, pp. 8-9.

We do not have a specific position regarding this proposal, as it needs further analysis and development, but the truth is that it does not seem out of place to us to have an agency, body or monitoring commission specialized in this matter, given its scope and high degree of complexity. This would allow a group of experts to devote themselves exclusively to ensuring respect for the fundamental rights enshrined, which are no small matter.

4. The German Code of Ethics - A brief analysis

This reference to abstract ethical principles is also made in Article 8 of the German Code of Ethics, where it is mentioned that the behaviour of artificial intelligence systems cannot be standardised, nor programmed so that they are ethically unquestionable, since it is also not possible to predict or program the behaviour of an ethically endowed human driver[32]. It is precisely because of the lack of the ethical-human dimension that the endowment of artificial intelligence systems with ethical-moral principles will always be done in an abstract way.

In this same Code, references are also made to the goal of artificial intelligence in autonomous vehicles - the achievement of safety in the mobility of individuals -, the protection of humans individually considered, this being precedent to any utilitarian consideration/minimization of damages, the need for authorisation for an autonomous vehicle to circulate - since its generalised use is not yet permitted -, the protection of the freedom of the individual, particularly in his decision-making, as well as the essential grounds of prevention and minimisation of harm, avoidability of harm to persons and the prohibition of discrimination, based on criteria such as age, gender, physical or mental constitution[33].

The fact is that, even if accidents are expected to occur in considerably lower numbers and with less severity, assuming that the damage is mostly material, autonomous vehicles will certainly be faced with dilemma occasions in which they will have to choose whether to hit one person or another. It is in these situations that the biggest problems arise. In these borderline situations, how should the artificial intelligence system be programmed to decide? To answer this question, producers and legislators will be faced with three major challenges: to make consistent decisions; not to create a shock in society with their programming/legislation choices; and not to discourage future users/consumers or technological development[34].

5. Possible choices and ethical preferences of future users/consumers of autonomous vehicles

Several studies were carried out to understand the ethical and moral options of future users/consumers, to determine the path to follow in the programming of autonomous vehicles in extreme situations. It is also essential to include society in these issues, otherwise autonomous vehicles will not be accepted due to lack of confidence in this new technology. One of the most popular and commented studies was called "The Moral Machine Experiment (MME)", which consisted of an experimental online platform, which gathered more than 40 million decisions, made by people from more than 233 countries. The main preferences of the volunteers could be centred on three main groups: saving people instead of animals - human life as the centre of artificial intelligence; saving a greater number of lives - utilitarian, harm-minimising view; saving young people instead of old. Comparing these results with the German Code of Ethics there is a coincidence with two of its articles: art. 7, which establishes human life as a priority; and art. 9, in which the utilitarian vision is established, without, however, identifying the situations in which it should be applied. Art. 9 also establishes prohibitions of discrimination, namely on the basis of age, which collides with the majority option of protecting the youngest[35].

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[32] Christoph Lütge, «The German Ethics Code for Automated and Connected Driving» [Online], *Philosophy & Technology*, Springer, Vol. 30, September, 2017, p. 554, available at https://link.springer.com/article/10.1007/s13347-017-0284-0, consulted on 23/10/2021.

[33] *Idem*, pp. 549-552.

[34] Jean-François Bonnefon/Azim Shariff/Iyad Rahwan, «The social dilemma of autonomous vehicles», *ob. cit.*, p. 1573.

[35] Edmond Awad/Sohan Dsouza/Richard Kim/Jonathan Schulz/Joseph Henrich/Azim Shariff/Jean-François Bonnefon/Iyad Rahwan, «The Moral Machine experiment» [Online], *Nature*, Vol. 563, november, 2018, pp. 59-60, available at The Moral Machine experiment | Nature, consulted on 23/10/2021.

This study also allowed us to verify that the individual considerations of each person, regarding religion, age, gender, education, and political options, have little reflection in the answers given. Similarly, it was possible to identify three homogeneous cultural vectors: the first group, consisting of North America and most Protestant, Catholic and Orthodox European countries, also including subgroups from Scandinavia and the Commonwealth; the second group, consisting of Eastern countries such as Japan and Taiwan and the Confucian Group countries, as well as Islamic countries (Indonesia, Pakistan and Saudi Arabia); finally, the third group refers to Latin America, South America and Central America. This division suggests that these groups may adopt similar ethical preferences[36].

There are, however, two issues that should concern policymakers and that will be an obstacle to a universal ethic: there are systematic differences between "individualistic" and "collectivistic" cultures - individualistic cultures, which emphasise the individual value of the human person, show greater preference for sparing a greater number of lives; collectivistic cultures, which show greater appreciation for older people in the community, show less willingness to protect the young, which coincides with the choices of the second Group of countries. These are two issues considered to be fundamental and, at the same time, seen as hindrances, in the achievement of universal ethical-moral principles. On the other hand, almost all the participants showed a greater preference for protecting women[37].

In an opposite way, another study, carried out by Yochanan E. Bigman and Kurt Gray, suggests that the conclusions obtained through the Moral Machine Experiment are biased, considering the way the questions are formulated, being its methodology insensitive to preferences for egalitarian options, forcing to choose one life or another[38]. Now, if the results of the MME suggest that people want to differentiate between human lives - killing old people instead of young, and men instead of women - this study aims to show that those are fallacious conclusions.

This study concludes that its participants overwhelmingly chose to treat lives equally, ignoring differences in gender, age, and status. The study begins by stating that the findings of the MME violate the provisions of various State Constitutions, the Universal Declaration of Human Rights and even the German Code of Ethics (we stress, however, that this last one is not compulsory, but only establishes some recommendations/guidelines). They later assume that their results were similar to the MME's, when they asked questions in which the participant was required to choose between one life or the other, without being given the possibility to treat the lives equally[39].

In the questions where fairness was put as a third answer option, it was found that this was repeatedly the option chosen by the participants. For example, in a situation where the autonomous vehicle had to choose whether to kill a man or a woman, 87.7% of the participants chose to protect women; when the possibility was introduced to treat men and women equally, with the vehicle making no decision and killing by inaction, this option was selected by 97.9% of the participants.

Thus, they conclude that the way forward may be for autonomous vehicles to ignore personal characteristics, and ethics should be based on structural aspects, such as saving as many people as possible and killing by inaction rather than by action[40].

Finally, some studies have pointed out that, even though, broadly speaking, people opt for a utilitarian/harm minimisation view towards autonomous vehicles, the truth is that, at the same time, they express more interest in a vehicle that chooses to protect its passengers, which may conflict with that utilitarian option. This will not be an easy problem to solve, since a purely utilitarian approach may discourage consumers from buying an autonomous vehicle and will also slow down technological development[41].

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[36] *Idem*, p. 61.

[37] *Idem*, pp. 61-63.

[38] YOCHANAN E. BIGMAN/KURT GRAY, «Life and death decisions of autonomous vehicles» [Online], *Nature,* Vol. 579, march, 2020, p. E1, available at Life and death decisions of autonomous vehicles | Nature, consulted on 23/10/2021.

[39] *Ibidem*.

[40] *Idem,* pp. E1-E2.

[41] JEAN-FRANÇOIS BONNEFON/AZIM SHARIFF/IYAD RAHWAN, «The social dilemma of autonomous vehicles», *ob. cit.*, pp. 1574-1575.

6. The (in)feasibility of the utilitarian perspective

Analyzing the philosophical perspective of utilitarianism or utilitarian views, it is necessary to be cautious with decisions or legislative options that are based on this perspective. This is because utilitarianism, in any of its aspects, is liable to lead us to ethically reprehensible decisions. Let us look at the example given by João Cardoso Rosas: "Consider, for example, a situation in which a fanatical majority intensely desires a harmless minority to be exterminated. If the extermination results in a greater satisfaction of preferences, the utilitarian will have to approve it"[42]. A current example of such a situation is Russia's invasion of Ukraine, since several studies show that the majority of the Russian population supports the war, on grounds such as fighting neo-Nazism. It turns out that such opinions are based on the news broadcasted by the Russian State itself, which controls the sources of information[43]. It is, therefore, an ethically reprehensible preference.

Furthermore, when utilitarian logics are limited to providing well-being for the majority of the population, this means, inversely, that a portion of the population is subjected to considerable sacrifices for the sake of the majority[44]. However, it is our understanding that minorities and the most vulnerable should also have their choices or even their fundamental rights attended to, especially when it comes to this matter of fundamental rights and ethics. This does not imply that utilitarian views will no longer be taken into account, since in any case the welfare of the generality of society will always be a factor to be taken into account when making decisions and creating normative devices[45].

Without intending to analyse the philosophical perspective of egalitarian liberalism, we align ourselves with the consideration of this current, which holds that there are individual, fundamental rights that are not available for the benefit of the general welfare[46]. Due to the importance of fundamental rights, it is our understanding that we are dealing with rights that are not negotiable, nor available to society for the benefit of majorities and minorities. It is with this ideal that any legislation that will be produced in order to endow autonomous vehicles with some ethical principles should be based. That is, the use of autonomous vehicles should always contend as little as possible with the fundamental rights of citizens, which should be safeguarded as far as possible.

Although these are expected to be rare situations, considering the decrease in the number of accidents and their severity, and it is expected that there will be a considerable lower number of injuries to people, the truth is that these are situations that should be taken care of and urgently addressed, since citizens need to know the ethical and moral principles with which autonomous vehicles are programmed, not only for the sake of transparency, but also to be able to trust and use this new technology.

7. Conclusion

It is undeniable that algorithms, and here especially those applicable to the operation of autonomous vehicles, raise several questions in terms of fundamental rights and ethical dilemmas, particularly because decision-making based on artificial intelligence will directly influence the lives of users/consumers. Although we cannot yet draw any concrete conclusions on what principles should be adopted and how autonomous vehicles should act in extreme situations, it seems essential to involve the population, allowing them to contribute and express their views on the principles on which these vehicles should be based.

Furthermore, it will be necessary to ensure that utilitarian theories are not applied blindly as a way to design the ethical principles to be adopted, under penalty of discriminating minorities and disregarding, in absolute, their fundamental rights and principles in favour of others, since all must be considered given their importance.

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[42] João Cardoso Rosas, *Handbook of Political Philosophy* (Manual de Filosofia Política), Almedina, 2008, p. 18.

[43] BBC News, «War in Ukraine: Did the Russians support the invasion?» [Online], march, 2022, available at https://www.bbc.com/portuguese/internacional-60859247, consulted on 19/04/2022.

[44] João Cardoso Rosas, *Manual de Filosofia Política, ob. cit.,* p. 29.

[45] *Idem*, p. 31.

[46] *Idem*, pp. 35-36.