On AI ethics in competitive environments

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Abstract. • In this paper, I talk about some proposed regulations regarding the development of Artificial Intelligence tools, and argue they are not strict enough to ensure safe AI development in competitive environments which have the tendency to spawn monopolies, as in order to reach a monopolistic position the competing developing teams have the tendency to cut corners on safety regulations. I analyze the fields of Superintelligence and Smart Weapons, and I argue that during arms races in these domains it is better not to follow regulations that slow the development down, in order not to give advantages to any (possibly malicious) competitor. I then emphasize the need for regulations and safety measures which do not set development back, for realistically those are the only ones that can reliably be followed by everyone.

Keywords: AI safety, Superintelligence, Smart Weapons

1 Introduction

Developing Artificial Intelligence tools in line with our moral and ethical values is important not only for granting fairness and equality, but, in the future, it could also become crucial for the survival of our species itself.
Yet, in this paper, I will argue that there are cases where it would be preferred not to impose restrictions on the development of such tools when said restrictions slow down AI development, in order not to favor malicious players, for the harm they could potentially cause could outweight the one generated by not imposing regulations.

Before digging deeper into the reasons of such a claim, it is necessary to introduce the concepts of *Exploitation*, *AI Ethics*, and *Competitive Environments*.

1.1 Exploitation

Exploitation is the act of taking advantage of a situation for an individual profit, be it physical, social, or psychological. Although it is generally used with a negative connotation, I would say that, to an extent, it is part of nature. The spider that weaves a web exploits the insect's roaming nature and inability to sense the web. The insect, in return, uses plants, roots and flowers as food, and those too take advantage of sources of water in the environment in order to grow.
Men are, obviously, not exempt from exploitation. In fact, I would say, humans represent the animal epitome of exploitation itself. Since their existance, people have gathered in tribes, hunted together, fought together, taking advantage of their ability to cooperate and communicate, as well as their superior capabilities of spotting danger, and crafting long-term plans accordingly to overcome it. We have pushed this concept even further, by building a socio-economic system based upon exploitation.[1]
Philosopher Robert Mayer says "It is usually thought to be wrong to exploit another person's attributes, for example when a pusher takes advantage of an addict's craving and sells her more drugs. But some traits can be exploited without the taint of unfairness, for instance when one player exploits the carelessness of another in a game of chess. In rare cases we might even think that an attribute deserves to be taken advantage of — for example, when the greed or arrogance of a villain is exploited so that he gets what he deserves. Exploiting another person's vulnerabilities, then, is usually wrong but not always."[2]

Taking advantage of natural resources, and leaving to find new lands when resources become scarce, or when climatic conditons become adverse, are also forms of exploitation animals, and humans in particular, have learned to apply. Men use lands for their personal gains, draining their natural resources, and then they move, but so do locusts. Exploitation, whether we like it or not, is part of us as humans and, more broadly, as animals, and it is a part of us which cannot be shut down completely.
The natural tendency towards exploitation human beings have is a crucial concept to understand the reasons behind this paper.

"You move to an area and you multiply and multiply until every natural resource is consumed and the only way you can survive is to spread to another area. There is another organism on this planet that follows the same pattern. Do you know what it is? A virus.
Human beings are a disease, a cancer of this planet. You're a plague and we are the cure."
— *Agent Smith*, The Matrix

1.2 AI Ethics and guidelines

In order for a tool to be socially acceptable it needs not to act against the values of our society. As an example, in the western world it is not socially acceptable for an employer to evaluate potential employees using their race or gender, when there is no reason to (although it sometimes happens anyway), so a tool used by an employer to filter applications should not discriminate candidates according to those attributes.
On the other hand, our ethical values are variable. The values we shared a century ago were very different from the ones we share today, which will likely also be very different from the ones we will share in the next century.[3]
Therefore, what we would ideally want are tools able to adapt to the ethical values of the society they operate in, which can be different even in the same temporal arc, for example when it operates in different countries, holding different cultural values, around the world.
The European Union defined[4] some ethic guidelines for trustworthy AI:

- **Human agency and oversight** — AI should only be a tool, which humans can fully control
- **Technical robustness and safety** — AI should be reliable, safe, and unharmful
- **Privacy and data governance** — AI should respect the privacy of its users, and ensure adequate data governance
- **Transparency** — AI should be able to explain its decisions in human-understandable terms
- **Diversity, non-discrimination and fairness** — AI should be unbiased, encouraging diversity without discrimination
- **Societal and environmental well-being** — AI should be usable for everyone's well being, in the short and in the long term
- **Accountability** — AI should clearly define responsabilities

Whether these are are enough or not, though, is subject of debate. Since those are only guidelines for developers, there is no actual obligation for them to build AIs according to those. Additionally, developing AIs following them naturally requires more time and resources, as developing an AI to perform a task is quicker than developing one to perform the same task while also ensuring data governance, defining responsibilities, being capable of explaining its decisions in human-understandable terms. This means that some AI developers could cut corners and decide not to abide one or more of these guidelines. It would in fact be problematic to check if those guidelines are applied at all, even if they were mandatory.
Some argue AI ethics will be a self-regulated process, in which the ones not using ethical guidelines will be punished by the users, and the ones following them will be rewarded. On this matter, AI expert Anne-Laure Thieullent says "Organizations must create ethical systems and practices for the use of AI if they are to gain people's trust. This is not just a compliance issue, but one that can create a significant benefit in terms of loyalty, endorsement, and engagement. To achieve

this, organizations (...) must not only define a code of conduct based on their own values, but also implement it as an 'ethics-by-design' approach."[5]
In the same document, the IEEE also claims "outside of anyone's positive intentions for what they build, an end-user's experience is not fully up to the designer—it is up to the end user. This is why ethically aligned design is so focused on the end-user and how they and their values can be a part of AI design from the beginning."
Although I generally agree with both claims, it is important to take a look at some edge cases where this might actually not hold true. First, let us put the focus on who the user actually is. When users are common people, then it is possible for the market to self-regulate and favor ethical companies or products, as people can directly express an influence through buying, or using, a product rather than another one.[6] But even if sometimes ethical movements have been proven to be able to influence the market, this does not always happen, there are plenty of cases where the majority of the people have ignored morality issues if, for instance, an "unethical" product or service is significantly cheaper than another one.[7]
Additionally, users of AI tools are not only individual people, they can also be larger entities, and even entire states.
States do not, in general, hold the same ethical values populations hold. Even if, as a facade, a state can claim to be using and developing only ethical AI tools according to the proposed guidelines, in practice it is hard to understand if this is actually true or not. There can surely be a form of self-regulation if a government is caught acting maliciously, in democratic states for example this can happen through elections. But in non-democratic, or pseudo-democratic states, this process generally does not happen. Additionally, even in democratic states, this regulation generally only happens afterwards, often years later, when the effects of an unethical AI development may be visible already. And this does not even take into consideration purely malicious governments, which may, however, exist.

While these guidelines are surely useful for whomever wants to develop tools taking an ethical approach, we cannot assume that everyone will follow them, we must instead act as if somoeone will not. In some fields, this can have a limited impact on the population, but in others it may even put our entire species at risk.

1.3 Competitive environments

A competitive environment is "a dynamic external system in which an enterprise tries to compete. The more vendors of a similar product or service, the more competitive the competitive environment is."[8]
4 macro-categories of competitive environments are defined:

- **"Pure competition** — In a perfectly competitive environment, many small companies produce similar products, and many consumers buy them. These manufacturers are small, and thus they can't influence the price, defined by supply and product demand. For example, when a farmer brings dairy products to the local market, this person can't change the market price and agrees with the going one.
- **Monopolistic competition** — In this environment, many manufacturers produce different products, although they might serve the same purpose. Customers can distinguish the products because of the differences in quality, features, etc. Businesses actively use advertising to promote their products and convince consumers that they are not like other products and have better quality. Companies in monopolistic competition are price makers, which means that they can influence the product price. However, to justify the price increase of their products, they should offer something exclusive to be unlike other businesses, for example, improve the quality of their goods.
- **Oligopoly** — In this market model, there's a small number of businesses, usually two or more. It's considered stable as companies don't compete but collude to obtain high market returns. Firms set and keep prices high together or under the leadership of one particular company. In an oligopoly, profit margins are higher than in a more competitive environment. However, the main problem of this market structure is that businesses often face a prisoner's dilemma, an incentive to cheat and act in their interests at the expense of other companies.
- **Monopoly** — There's one company that produces a unique product. This manufacturer doesn't face any competition, and the product doesn't have any substitutes. Also, a monopolist decides on the product's price and sets barriers for new companies to enter the market."[9]

For our purposes, I am going to consider monopolistic competitive environments only, as in these clutch sectors it seems to be the most realistic scenario, and it is the one which can create the most problems.

2 General-purpose Artificial Intelligence

According to a Stanford study,[10] the speed of AI development is outpacing *Moore's law*.[11] Although the development of this technology currently involve special-purpose AIs, which are tools developed with a single purpose (i.e. play a videogame, compose a song, generate text), the ultimate goal will be to create an universal tool, one that is able to perform well in every field of application. Such a tool, called *General-Purpose Artificial Intelligence* (GPAI or AGI), will be able to understand the context it will operate in, rather than having it formalized a priori. The current state of the art AIs do not come close to the abstraction capabilities required to perform such a task, but the technology is in rapid development, and new discoveries in the field make things we thought decades away from being accomplished a reality. When this result will be achieved is yet unclear, some say decades, some centuries. Researchers believe there is a 50% chance of AI reaching (and possibly surpassing) humans in all tasks in 45 years.[12] Although we are currently far from reaching the level of technology required to create an actual GPAI, we should start considering this scenario as soon as possible, as we need to be ready when the technology will be mature enough.
Note that I am not arguing about the possibility to create a strong AI, for that goes beyond the scope of this essay. Whether or not it is possible to build a strong AI capable of *actually* thinking is not a prerequisite for a GPAI.

2.1 Superintelligence

According to Nick Bostrom, a superintelligence is "any intellect that vastly outperforms the best human brains in practically every field, including scientific creativity, general wisdom, and social skills."[13]
Therefore, according to this definition, a superintelligence is a GPAI whose level of intelligence surpasses that of human beings. The moment where a GPAI surpasses human intelligence is called *singularity*. It is clear that any individual, company, or country able to create such a technology would massively profit from it.
Successfully creating a Superintelligence could, according to Bostrom, allow us to create even better AIs, as the Super AI would be able to craft AIs better than we do, therefore it could create more powerful tools, which in turn could create increasingly more powerful AIs, and so on. Mathematician I. J. Good called this process "Intelligence Explosion".[14] For this reason, Bostrom claims such an invention would be the last one mankind will ever have to build.[13]

Max Tegmark predicts twelve possible scenarios for the future of humanity, depending on how AI is created and evolves.[15, 16]

1. **Libertarian Utopia** — Humans and Superintelligences coexist peacefully thanks to property rights.
2. **Benevolent Dictator** — A Superintelligence runs society and makes its rules, for the good of everyone, and people accept it.

3. **Egalitarian Utopia** — Humans and Superintelligences coexist peacefully thanks to property abolition and universal basic income.
4. **Gatekeeper** — A Superintelligence is created with the goal of preventing the creation of another Superintelligence.
5. **Protector God** — A quasi-omniscient and omnipotent Superintelligence maximizes human happiness without people realizing they do not have control over thier lives.
6. **Enslaved God** — A superintelligence is somehow controlled and constrained by humans, with the goal of producing wealth and technology for their controllers.
7. **Conquerors** — A Superintelligence takes control of the world and decides humans are a threat or a waste of resources, and decides to eliminate them.
8. **Descendants** — Superintelligences replace humans, giving them a graceful exit, like sons replacing their parents.
9. **Zookeepers** — An omnipotent Superintelligence keeps some humans around like zoo animals.
10. **1984** — An human-led, Orwellian-like surveillance state prevents anyone from developing a Superintelligence and bans certain kinds of AI development
11. **Reversion** — Technological AI progress is prevented by reverting to a pre-technological society, in the style of the Amish.
12. **Self-Destruction** — Humanity never reaches the needed level of technology to create a Superintelligence, due to a mass extinction through a nuclear war, climate change, or other disasters.

Excluding the cases where Superintelligence is never reached, roughly half of these outcomes would be dystopian, to a certain extent. Obviously this is basically science fiction, even if it is an educated guess, but it is also clear that these outcomes also depend on who manages to develop this kind of technology, which safety measures are taken, and how it is then used.

2.2 AI-supremacy Race

It seems obvious that a Superintelligence, able to spark an intelligence explosion, would be an incredibly valuable tool for anyone controlling it. However, given that such a tool could potentially harm us in ways we will probably not be able to foresee, it could also reveal itself as our demise.
Whether that can happen or not depends on multiple factors, most of which we likely cannot even predict. However, it is reasonable to presume two of those: if the Superintelligence is directly developed by, or falls into, malicious hands; and if the Superintelligence is not developed including enough safety measures (which could cause problems even in "good" hands).
The two factors do not, on their own, imply a disaster, but a malicious user would presumably use such a tool for its own good rather than the good of everyone, which could cause problems for the others if their interests are not aligned with said user. In addition, even if it is possible that a Superintelligence

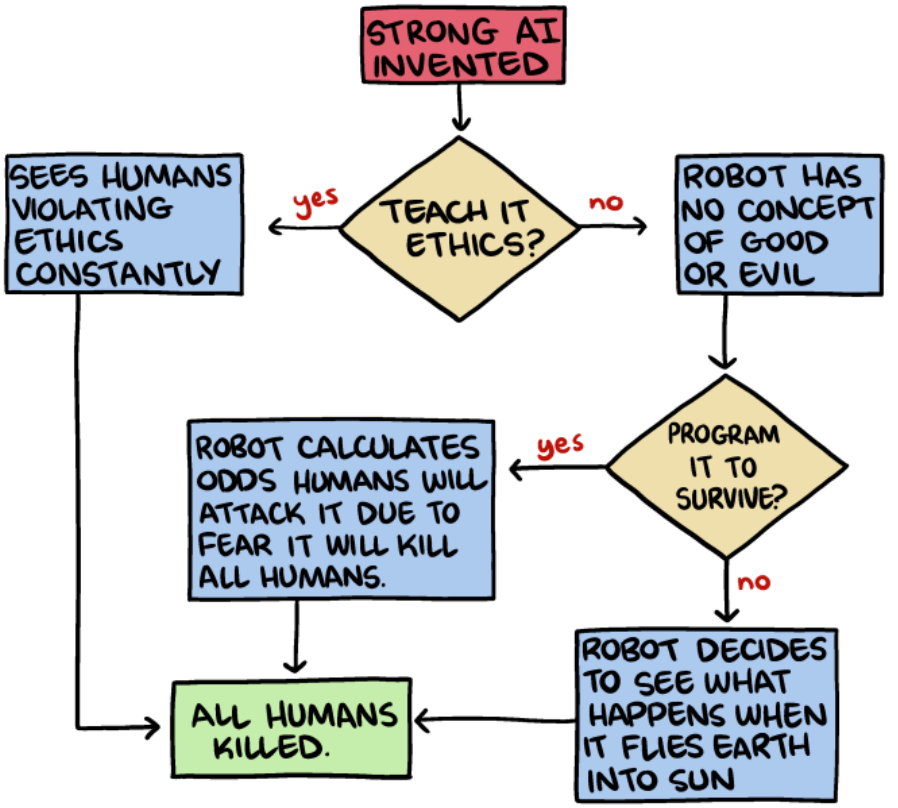
developed without safety measures can actually turn out to be safe to use, it is probably less safe to use than if it was developed with such limitations.
Therefore, two things should be ensured: that the development of AI tools progress in a safe way, and that the developed tools do not fall into malicious hands.

Ensuring safe development on its own is quite problematic, when we talk about Superintelligence. First, there is the problem of defining safety measures which, when applied, guarantee safety development in a reliable way. But let us assume we can come up with these measures, there is an even bigger problem: imposing these rules upon every AI developer. Philosopher and neuroscientist Sam Harris says on this matter "given that companies and governments doing this work are likely to perceive themselves to be in a race against all others, and given that to win this race is to win the world, provided you don't destroy it in the next moment, then it seems likely that whatever is easier to do will get done first."[17]
Creating a race on Superintelligence could potentially cause more damages than good, as during arms races it seems plausible for some developers to be more keen on ignoring some safety rules in order to earn a significant advantage on their opponents.
But how likely this scenario is? 2013 paper "Racing to the Precipice"[18] by Armstrong, Bostrom, and Shulman, tries to calculate the probabilities of an AI disaster happening in an hypothetical arms race between different development teams. The paper takes into consideration the developing capabilities of each team, whether they have informations about their level of capabilities and the relative level of their competitors, the amount of enemity between the teams, and the level of risk they take developing the AI, and it calculates their Nash equilibrium, under the assumption that the team which develops the AI tool first earns a decisive advantage over the others, thus winning the race.
Counter-intuitively, their findings show that when information is public, teams tend to risk more, on average, compared to the no-information case. This happens because when a leading team sees that a competitor is getting closer to their level of development, it will raise the amount of risk taken. Additionally, teams that know they are behind in development compared to the others will increase their amount of risk, and so will teams with lower levels of developing capabilities. Unsurprisingly, when the level of enemity is high teams tend to take more risks.
Thus, the authors propose to decrease the level of enemity by encouraging cooperation between the teams. However, per their own findings, this could cause problems, as in order to increase cooperation it is necessary to also increase the amount of information shared, which may raise the overall amount of risk.
Additionally, cooperation would require trust, and as I argued earlier, it may not be possible to fully trust even your allies, especially when the AI in question is a Superintelligence and the parties are governments. Some governments are not trustworthy and could secretly do separate work on the subject, or claim to be doing ethical development while in reality not doing so, exploiting the

trust of their allies. And if not all governments are trustworthy, then even with international agreements we still fall under some sort of prisoner's dilemma,[19] in which it is mathematically more convenient (and safe) to "betray" the others rather than honoring the agreements.
Moreover, while it is possible for some governments to form Superintelligence development joint teams, it is extremely unlikely that *all* major players would do so, and if even only one does not, then we fall again into the arms race scenario.
For these reasons, my opinion is that ensuring safe development in these conditions does not seem feasible.

What about safe usage, then? Analyzing how to ensure safe usage seems an easier task compared to the safe development case. It comes natural to think that, considering the potentially limitless power of a Superintelligence, we can have control on who uses such a tool only if we are the ones developing it. Therefore, the only direct way for us to ensure safe usage is to "win the race", to be the first ones to develop a Superintelligence.
Naturally, that alone does not warrant a safe Superintelligence usage; we must also come up with usage rules we strictly need to follow, without giving single individuals the power to decide on its use according to its moral and ethical values, which, considering that virtually all individuals irrationally inflate their moral qualities and think of themselves as morally superior compared to the majority of the others,[20] would eventually cause issues. I am, however, going to ignore this aspect, not because it is not important, but because it is a problem too complex to solve here, assuming it is even possible to solve. What is important to understand is that to ensure the safe usage of a Superintelligence it is at least necessary to be its developers, otherwise we can only hope it will not be used in an harmful way, and I would argue that we should probably avoid leaving the future of mankind in the hands of hope alone.

Warranting safe development is hard, if possible at all. What we can try to do is to use it in a safe way, and in order to do that we must first be the developers. To be the developers, it is necessary to win the race, and in order to do so we will have to cut corners on safety measures, as some competitors likely will do so. Since having an unsafe development and a safe usage is better than having unsafe development and also risking unsafe usage, my opinion is that the lesser evil would be be to cut corners on safe development in order to win the race and, if it does not end in a disaster, we can focus on using this tool in a safe way.
This is obviously potentially catastrophic, but unless we find a way to stop progress, and I cannot think of any non-destructive way to do so, the future looks grim, we will have to rely on mere chance in order to avoid a Superintelligence disaster, and the odds do not look favorable.


STRONG AI INVENTED
TEACH IT ETHICS?
yes
no
SEES HUMANS VIOLATING ETHICS CONSTANTLY
ROBOT HAS NO CONCEPT OF GOOD OR EVIL
PROGRAM IT TO SURVIVE?
yes
no
ROBOT CALCULATES ODDS HUMANS WILL ATTACK IT DUE TO FEAR IT WILL KILL ALL HUMANS.
ROBOT DECIDES TO SEE WHAT HAPPENS WHEN IT FLIES EARTH INTO SUN
ALL HUMANS KILLED.
smbc-comics.com

3 AI-powered weapons

"For the want of a nail the shoe was lost,
For the want of a shoe the horse was lost,
For the want of a horse the rider was lost,
For the want of a rider the battle was lost,
For the want of a battle the kingdom was lost,
And all for the want of a horseshoe-nail."
— Benjamin Franklin

If Superintelligence might seem too distant in time to be cared about now, let us instead consider something very much real already. AI-powered weapons, or smart weapons, are weapons which make use of Artificial Intelligence in order to increase their efficiency.

Technology driven weapons are not news. Even in the early '40s, radio-controlled ammunitions were used by the Germans in World War Two.[21]
In the '70s, the US developed and made use of laser-driven weapons to enhance ammunition precision. Regarding their efficiency, we now know that "Only about 9 percent of the munitions dropped in the Gulf War – 7,400 of 84,200 tons – were precision-guided, largely because stockpiles were limited. But that 9 percent was responsible for 75 percent of the damage done to strategic targets".[22]
Naturally, technology has since then massively evolved. While, previously, technology was used to track a target and adjust the trajectory mid-air, thus ensuring better accuracy compared to "dumb" weapons, said target was still identified by a person. AI-powered weapons, on the contrary, aim at creating fully autonomous machines, able to identify the targets and strike with unprecedented precision. Due to their exceptional accuracy and decision-making speed, it is no surprise that the biggest superpowers of the world have massively invested in this sector, thus virtually starting a new arms race, one involving AI-powered weapons.
Russian president Vladimir Putin said in 2017 "whoever reaches a breakthrough in developing artificial intelligence will come to dominate the world."[23] After these statements, US president Joe Biden opted not to ban "killer robots",[24] following a panel led by former Google chief executive Eric Schmidt, which concluded that the US "has 'moral imperative' to develop AI weapons."[25]

Recently, the US has publicly rejected calls for regulating or banning such weapons. On this subject, US officials said "In our view, the best way to make progress (...) would be through the development of a non-binding code of conduct."[26] There is no doubt that not regulating the subject is the fastest way to make progress in the field, however the question is, is it also the most ethical choice?

War has rules.[27] Any weapon created should be usable within these rules, without breaking them. In the case of human-controlled weapons there is more control on how the weapon is used, as a (trained) human is capable of discerning a fighter from a civilian, an enemy base from an hospital, or a fighting soldier

from a surrendered one, but with AI-powered weapons we need a way to assess they actually abide these rules. Additionally, if these rules are broken, in one case we can easily assign responsibilities, but in the other one it becomes a problematic task.
So in order not to break these rules, we should focus on how to develop weapons that only hit the targets selected, that selects these target at least as well as a trained human would do, and we should also clearly define who is responsible for eventual mistakes.

At least in theory. In practice, however, things may be different. Given that, as I argued earlier, non-binding regulations (like the ones proposed by the US) are not very useful, and given the refusal of the US government to impose actual restrictions, it seems that the general policy will be not to regulate the field at all, with the purpose of not slowing down the development of such weapons. If Russian president Vladimir Putin is right and who will dominate AI will dominate the world, then any kind of development advantage could be decisive.
In the Superintelligence case, the possibility of others not applying safety measures was only speculated. With these weapons, on the other hand, we already know others will not apply them. The question then becomes, is it ethical to develop such weapons in an "ethical way" (using time and resources to ensure safe usage), if doing so gives the others a potentially decisive advantage?

On a different note, even if these war laws are in place, it does not seem like they are highly regarded. War Law is somewhat universally followed, but history is still full of episodes where single individuals, governments or countries did not follow it.[28] There is virtually no side which has not, in their history, broken Law of War at least once. Being punished for those violations usually depends on victory or defeat, as the winning side is rarely punished for the war crimes they have committed. This does not mean we should not care about breaking War Law, but it is important to consider that others will not. Air Force General Curtis LeMay said of the 1945 bombing of Tokyo, "Killing Japanese didn't bother me very much at that time (. . .) I suppose if I had lost the war, I would have been tried as a war criminal (. . .) Every soldier thinks something of the moral aspects of what he is doing. But all war is immoral and if you let that bother you, you're not a good soldier."[29]

For these reasons, my opinion is that it would be better to develop such weapons without imposing any regulation that can slow development down, as we know for certain that others will not do so. Imposing regulations would put us in a disadvantageous position, and being technologically behind when it comes to war, in a period of rising tensions,[30, 31, 32] is something we have to avoid. After you have developed a weapon you can decide not to use it (unless it is necessary to do so), but if you do not have it developed you cannot use it. After all, we are talking about war and killing machines, for a purpose which is intrinsecally unethical on its own. And, as we know, *all Is fair in love and war.*

4 Conclusions

The goal of this essay is obviously not to claim guidelines are not useful, or to say that we should not take ethical concerns into consideration when developing AI tools. The aim is to carry the debate forward in some key sectors, where the ethical problem is extremely complex and it cannot be solved with some simple guidelines. It is necessary to consider that someone *will not* play by the rules, which can put the ones following them in a disadvantageous position. If this happens between companies, the impact on society is somewhat limited, but if this happens between countries and the sector involves war, for example, this can have a devastating impact.

It is debatable whether it is "more ethical" or not to slow down the development of AI tools by forcing it to abide human ethics and morality, when this happens in a key sector, in a highly competitive environment that includes malicious parties who do not impose such restrictions not because they do not consider the ethical questions related to it, but because they do not care about the consequences of such ethical defaults/non-compliances, as long as they reach their goal. This leads to the paradox where it could, in some cases, be more ethical not to develop AIs in an ethical way, as letting these parties win could be more harmful.
If something can be exploited for personal advantage, either by single individuals, by corporations, or by countres, it eventually will be. Tax evasion is illegal, yet tax havens exist. People, or companies, bring their money abroad to such havens, exploiting the taxation system to their advantage. At the same time, it is profitable for some countries to act as tax havens, as doing so grants them a massive boost of disposable income, even if low-taxed.
For the same principle, simply forbidding developers from not-implementing ethical constraints in artificial tools will not, in my opinion, stop them from actually developing such unethical tools. The risk of doing so is the possibility of favoring the development of anti-ethical AI tools in *AI havens*, where AI development is unregulated, for they grant the highest probabilities of winning the AI race.

Imposing rules and punishing who does not follow them can work with individual citizens, as there is a limit to the damages a single individual can do: a murderer kills a person and is caught, a terrorist can kill hundreds, even thousands, and then he is caught, the results of their actions are still limited compared to the entirety of the population, so we can "afford" it; but we cannot retroactively punish unethical AI development, at least in some fields, as the damages done could harm the whole population.

The search for effective regulations and limitations which do not slow down development will be key in the next future, and every other kind of regulation, or guideline, will likely become futile and even deleterius.

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