

LIABILITY FOR THE TRAFFIC OF AUTONOMOUS CARS IN THE CONTEXT OF THE PROTECTION OF HUMAN RIGHTS²

1. INTRODUCTION

In the contemporary, rapidly developing world of new technologies, autonomous cars are no longer just an abstract concept, which used to feature in futuristic literature or cinematography. At present, many countries (in particular the United States and the United Kingdom) carry out tests with autonomous vehicles and, under certain conditions, allow private individuals to use autonomous cars. As a result, legislation to provide for autonomous cars is gradually being drafted. However, despite these measures being pursued by some national legislators, no relevant comprehensive regulation has been in place. The rules introduced in recent years in a small number of countries (the United States, the United Kingdom and, to a limited extent, Poland³) fail to address all the important issues pertinent to autonomous vehicles.

It is worth deepening this issue in the context of a buoyant development of new technologies⁴. Especially given that the rapid development of autonomous cars today links to liability for their movement, both in terms of civil traffic and the use of vehicles for military purposes. Accordingly, the above necessitates the rules of liability for the owners of these vehicles, their administrators and, finally, the countries which apply them in civil and military use. The definition of liability rules for the use of autonomous vehicles is particularly relevant in the context of the protection of human rights, in particular the right to life and health. Legal standards applicable to this issue should ensure an adequate level of protection of these rights.

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³ Act of 20.6.1997. - Road Traffic Law (consolidated text Dz.U.- Journal of Laws of 2018, item 1990, as amended).

⁴ N. BOSTROM, *Superinteligencja. Scenariusze, strategie, zagrożenia*, Gliwice 2016, p. 24 *et al.*

On this occasion, I wish to claim that the current rules do not suffice to solve the problems relating to autonomous vehicles - in particular, liability for damage caused by their operation.

2. DEFINITION OF AUTONOMOUS VEHICLE

Consideration of legal liability for the traffic of autonomous vehicles should derive from a definition of the principal problem relevant for the very understanding of the concept of autonomous vehicles. This concept is, of course, not clear in science. A number of definitions describe the autonomous vehicle in different ways. They allow attempt to be made to characterise an automated car as having the capabilities of sensing, planning and acting. The vehicle is also equipped with artificial intelligence and technology capable of driving or driving without human active surveillance or monitoring. In this way, autonomous cars should be distinguished from those already accepted to public traffic which are equipped with driver assistance technology (such as cruise control or automatic parking)⁵.

SAE International (SAE)⁶ has developed its own classification of vehicle automation. It has identified five levels of automation and a so-called zero level. According to the lowest level of automation, the driver is involved in driving the vehicle at all times. The vehicle can send signals to the driver, issue warnings and even intervene in certain situations, still cannot be governed on a permanent basis.

On the first level, the driver and the automated system share control of the vehicle. By way of illustration, the system can use of adaptive cruise control, control speed or assistant in parking. However, the driver must always be ready to take full control of the vehicle at any time ("Hands on").

The second level assumes taking full control of the vehicle by the automated system (this applies to such driving tasks as acceleration, braking and steering). Nonetheless, the driver

⁵ The above definition has been used in the project *Regulating Emerging Robotic Technologies in Europe: Robotics facing Law and Ethics*, all available online at: http://www.robolaw.eu/RoboLaw_files/documents/robolaw_d6.2_guidelinesregulatingrobotics_20140922.pdf

⁶ These comments may also apply *mutatis mutandis* to classifications developed by other organisations. However, the SAE classification seems to me the most comprehensive. Conf. <https://www.nhtsa.gov/technology-innovation/automated-vehicles-safety#resources>

must monitor the driving of the vehicle and stand by to intervene immediately in an emergency should the automatic system malperforms ("Hands off"⁷).

In a third level vehicle, the driver can safely distract oneself from driving. The vehicle is well-positioned to intervene in situations that would require an immediate response (such as emergency braking). The driver just needs to intervene only to a limited extent, as specified by the manufacturer, after being called upon to intervene by the vehicle ('Eyes off').

At the next level, human intervention is never required for the safe movement of the vehicle (for instance the driver can both sleep and sit off the driver's seat). However, for this to be possible, certain conditions must be met. Such a vehicle is capable of driving altogether independently only under certain driving conditions or special circumstances, such as traffic jams. Outside these areas or circumstances, the vehicle must be able to safely stop the journey, by way of illustration stop and park the car if the driver does not take control ("Mind off"). The highest level of automation provides that no human intervention is required.

In conclusion, automated vehicles are already widely available on the market and common on public roads. What is more, we tend to deal with cars in an automated range - it is enough that such a car is equipped with ABS or adaptive cruise control. On the other hand, an autonomous vehicle will only be one that is fully automated and does not require any human intervention.

3. ALGORITHM AND ASSIGNMENT OF LIABILITY

3.1. AUTONOMOUS VEHICLE ALGORITHM

As anticipated, the implementation of autonomous vehicles in road traffic will improve safety on public roads. Autonomous cars are supposedly an opportunity to increase road safety by reducing the number of accidents caused by human error. Amongst these errors, one can point to distractions of driver attention or a reduction in driver alertness and concentration while driving. Moreover, the advent of autonomous cars is intended to reduce the use of non-renewable raw materials and also to make traffic flow smoother by reducing traffic jams. As

⁷ However, the term "hands off" should not be taken literally. In fact, contact between the steering wheel and the wheel is often mandatory when driving SAE 2, in order to confirm that the driver is ready to intervene.

the European Commission pointed out, human error triggered around 95% of all road accidents in the EU, with 30 000 deaths and 1.5 million injuries *p.a.* Road transport also accounts for a quarter of total energy consumption in the European Union. It has been highlighted that computer- and telecommunications-based technology can make these figures more optimistic⁸.

It should be emphasized that the construction of an algorithm which would make a specific decision in the event of a danger in road traffic is not a purely legal task, but also depends on the axiology adopted. It is a very important issue, because lives may depend on the construction of the algorithm and decisions taken *vis-à-vis* road traffic danger. It can be illustrated by the so-called draisine paradox, which shows the problem of unobvious choice, which can occur in various situations. In his work,⁹ P. Lin presented an example in which a train observer can decide whether to change the direction of train travel and thus only one person will die on the track, or maintain the current direction, which would bring a death toll of five. The author of the draisine paradox argued that regardless of the decision that the train driver will make, none of them will be good. However, it should be stressed that if no decision is taken by the train driver, they should not be held liable for the consequences of the accident. On the other hand, if the train were to change direction, they would make an informed decision, conducive to death of a specific person who had not previously been on the track. It could be held liable for the death of that person as a result of its decision. However, the legislator cannot leave the matter unresolved and must take a decision based on axiology.

The draisine paradox illustrates a problem of whether or not a human decision has been taken. An analogous example can also be applied to a machine that makes choices as per a pre-programmed algorithm. A question to illustrate the above issue of the algorithm construction is how artificial intelligence should behave, having to choose between a collision with the motorcycle rider who follows the laws and is wearing a helmet, and the one who, contrary to the rules, fails to do so¹⁰. Should it choose a collision with the rider who acts in accordance with the law and thus lessen the damage (or reduce it altogether), than it would arise in a collision with the one who fails to comply with the law on road safety?

It should be concluded that the algorithm should be constructed by the legislator. The issue cannot be left to the discretion of private parties, such as a producer of autonomous cars,

⁸ Data as of 3 April 2014, <http://ec.europa.eu/digital-agenda/en/about-mobility>.

⁹ P. LIN, *The robot car of tomorrow may just be programmed to hit you*, May 6, 2014. Retrieved on May 29, 2014 from: <http://cyberlaw.stanford.edu/publications/robot-car-tomorrow-may-just-be-programmed-hit-you>.

¹⁰ Conf. footnote No. 2.

for example. No doubt that the algorithm will be subject to axiological choices by the legislator, for this is not a purely legal issue. The law here coincides with specific axiological choices that derive from the philosophy adopted and the values and principles professed in society. The algorithm should include specific rules, set in a strict hierarchical order. The inability to adapt to a hierarchically superior rule will cause the system to adapt to the recommendation of the subsequent hierarchically superior one. For example, the first rule could be an instruction to avoid collision with another vehicle, person or object. If, however, such a collision cannot be avoided, the autonomous vehicle should behave in such a way as to minimise injuries and the number of victims of the collision. Furthermore, the algorithm should be programmed so that human life is always more important than tangible items¹¹. The algorithm should first of all aim at the protection of life, only then at the reduction of material damage. Finally, the algorithm should not differentiate the human life depending on such objective factors as age, sex, race.

3.2 LIABILITY FOR THE TRAFFIC OF AUTONOMOUS CARS *DE LEGE LATA*

In the case of autonomous cars, it is questionable whether the current liability rules should be maintained. Firstly, should the vehicle passenger or administrator be allowed to take over the control of the vehicle and therefore also the liability? What consequences could this produce in terms of criminal liability? After all, for example, too slow a takeover or failure to take control of a car cannot be equated with fault on the part of the motor vehicle operator. Indeed, the scope of passenger autonomy with reference to the vehicle paradoxically affects the scope of the administrator's liability. The absence of autonomy (that is the inability of a person to take control of a vehicle) excludes liability, and partial liability – and must be specifically provided for. A passenger, be it vested with a certain amount of interference, must not be equated to a driver as construed today. The situation of an autonomous vehicle passenger (within the meaning of the fourth or fifth level of automation of SAE organization) may be identified with the situation of a passenger in public transport, such as a train or a bus. Such a passenger has no influence on the traffic of such a vehicle, so it is difficult to hold them liable. Nevertheless, the question is whether, in the case of autonomous vehicles, a system of strict

¹¹ Conf. A. CHŁOPECKI, *Sztuczna inteligencja – szkice prawnicze i futurologiczne*, Warszawa, 2018, p. 29. The author also points to a situation which raise doubts of whether the algorithm should always be guided by the principle that material damage is always of lesser importance than human life (for instance in the case of damage caused by an incident at a nuclear power plant and causing unspecified damage).

liability should be maintained¹² and a compulsory civil liability insurance scheme for passengers in autonomous vehicles should be introduced¹³.

In the case of administrators operating entire autonomous car traffic systems (the so-called coordinators of autonomous car traffic¹⁴), the drawbacks of these systems may be due to two categories of premises. Firstly, the defect may be caused by the coordinators of autonomous vehicle traffic and secondly - by the intervention of third parties. If the damage is caused by the coordinator of the whole system, the attribution of liability will not pose a particular problem. The classic principle of liability based on the fault of the operator will apply. But what if the damage stems from the exclusive fault of a third party? The operation of systems to coordinate the traffic of autonomous vehicles may tempt third parties to interfere. Due to a hacker attack, the autonomous vehicle traffic management system could be conceivably taken over and the hacker causes all cars in a city to turn left at full throttle... The consequences of such an event are obvious. Should we, therefore, maintain the situation where (notwithstanding the principle of risk, as exemplified in Article 435 of the Civil Code¹⁵) the administrator exonerates itself from liability because the damage resulted from the exclusive fault of a third party? With a view to protecting the passengers of autonomous vehicles, the legislator should rather choose not to apply this exoneration requirement by the entity managing the system.

Although a similar situation (where the liability of banks – by way of illustration - approaches absolute liability) is now developing in the financial system, where the case law – this going unnoticed by the back door - introduces the principle of 'if you let the system hack you - you are guilty'. However, this issue must be addressed by the legislator.

4. ACCEPTANCE OF THE USE OF AUTONOMOUS VEHICLES FOR MILITARY PURPOSES UNDER INTERNATIONAL LAW

¹² A. OLEJNICZAK, *Art. 436*. In: *Kodeks cywilny. Komentarz. Tom III. Zobowiązania - część ogólna*, Ed. II. Warszawa, 2014.

¹³ P. BUCOŃ, *Rozdział 2 Zasady odpowiedzialności cywilnej posiadacza za szkody wyrządzone mechanicznym środkiem komunikacji poruszającym za pomocą sił przyrody*. In: *Odpowiedzialność cywilna uczestników wypadku komunikacyjnego*. Warszawa, 2008 and G. BIENIEK [in:] G. Bieniek et al., *Komentarz...*, Vol. I, Warszawa 2011, Commentary on Article 435 (2); W. Dubis [in:] *Kodeks cywilny...*, ed. E. GNIEWEK, P. MACHNIKOWSKI, Warszawa 2016, Commentary on Article 435 (2).

¹⁴ Conf. https://ec.europa.eu/transport/themes/its/c-its_en

¹⁵ M. WAŁACHOWSKA and M. P. ZIEMIAK, *Article 435*. In: *Kodeks cywilny. Komentarz. Tom III. Zobowiązania. Część ogólna (Articles 353-534)*. Warszawa, 2018.

Public debate on using autonomous vehicles focuses on their use in civil traffic. Importantly, the odds are high that individual countries seek to use autonomous vehicles for military purposes, which may involve their direct or indirect use as a carrier of a new type of weapon. This application of autonomous vehicles may give rise to new threats and risks to human rights. It is then necessary to identify those areas of international law which are not adapted to the problem of autonomous cars, and potential conflicts which may unfold from the use of autonomous vehicles for military purposes.

The question also arises as to whether and to what extent the use of autonomous vehicles for military purposes should be permitted¹⁶? What are the dangers, particularly for the civilian population, of using new technologies, including autonomous vehicles, for this purpose? The rules for the use of autonomous vehicles for military purposes should be detailed out, and (or above all) the protection of the rights of the civilian population and the protection of civilian facilities must be taken into account. It seems obvious that the widespread use of new autonomous technologies will also bear on the pursuit of armed conflicts by states. Accordingly, the law cannot be indifferent to this topic.

The legal standards governing the use of a new type of weapon, a new measure or a new method of warfare are contained in Article 36 of the Additional Protocols to the Geneva Conventions of 12 August 1949 on the Protection of Victims of International Armed Conflicts (Protocol I) and on the Protection of Victims of International Armed Conflicts (Protocol II)¹⁷. Under these acts, when conducting research, development, acquisition or introduction of new weapons, a new measure or a new method of warfare, a Party to the Convention is required to determine whether their use would in certain or all circumstances be prohibited by the provisions of the *Protocol* or by any other provision of *international* law applicable to a Party to an international agreement. Each State-Party to Protocol I and Protocol II is required to determine whether the use of autonomous vehicles for military purposes is compatible with binding international law.

¹⁶ The question may also be asked whether the use of artificial intelligence in military operations should be allowed at all, in particular if such technologies are only available to one party. Note the advantage over the opponent which the use of new technologies by one of the parties in the area of weapons used in armed conflict offers. However, it is difficult to expect that countries will give up such solutions for humanitarian reasons. It is to be hoped, however, that proper regulation of this issue in international law will at least allow the negative effects of the use of autonomous weapons to be limited.

¹⁷ Protocols additional to the Geneva Conventions of 12 August 1949, relating to the Protection of Victims of International (Protocol I) and Non-International (Protocol II) Armed Conflicts and adopted in Geneva on 8 June 1977. (Dz.U.-Journal of Laws of 1992, Issue 41, item 175, as amended.)

In particular, it must be emphasized that the principles of international humanitarian law require that attacks be directed only at combatants and military facilities. Civilians, on the other hand, are protected from direct attack unless they are directly involved in warfare¹⁸. International humanitarian law requires the parties to a military conflict to provide ongoing protection for civilians and civilian facilities. This obligation highlights the principle of taking the required precautions when conducting military attacks and applying a series of qualitative assessments in order to avoid or minimise collateral damage. On the other hand, the legality of autonomous weapons should be assessed in view of their intended outcomes and their intended use¹⁹.

Particular mention should be made of the so-called Martens Clause in the preamble to the IV Hague Convention²⁰. Pursuant to the Martens Clause, in situations not covered by the provisions of the Fourth Hague Convention, the population and the warring parties are placed under the care and authority of the principles of the law of nations, as they result from customs established between civilised nations and from the principles of humanity and the requirements of social conscience. Opinions have been voiced that the States are required to assess whether new autonomous weapons comply with these principles. Alternatively, the Martens Clause is not a criterion per se, but rather a reminder that, even if new technologies and their application are not covered by specific international laws, other international standards apply in this situation, which do not explicitly address new technologies²¹.

Interestingly, according to an international rule, if an attack proves to be disproportionate or otherwise contrary to international law, the attack must be cancelled or suspended. Consideration should be given to whether autonomous weapons will be capable of rapidly capturing and analysing relevant changes in the environment and adapting their action to the new situation. If so, the autonomous weapon will comply with the above requirement of international law. However, it may be necessary to define criteria for how the autonomous system should assess the current situation in the environment and the dynamics of change in that context²².

¹⁸ *Ibidem*.

¹⁹ *Autonomous Weapon Systems, technical, military, legal and humanitarian aspects. Expert meeting*, Geneva, Switzerland 26-28 March 2014, p. 23.

²⁰ The Martens Clause is included in the preamble to the IV Hague Convention of 1907 on the Laws and Customs of War; the Convention on the Laws and Customs of War on Land. (Journal of Laws of 1927 Issue 21, item 161).

²¹ Conf. footnote No. 13.

²² *Ibidem*.

In the debate on the use of autonomous arms, opinions have been formulated about the specific advantages of such weapons. In particular, autonomous systems would not be exposed to human emotions such as fear, hatred and so on. Autonomous systems could be considered additional precautions, as defined by international law, because they would not be as concerned about their own security as humans. Furthermore, they could ensure greater transparency in their actions, since they could be equipped with devices for audiovisual recording of information and would not need to conceal the information collected²³. From a formal point of view, autonomous vehicles would be able to comply with international law in an exemplary way.

On the other hand, the absence of human emotions in artificial intelligence may also place autonomous vehicles at a disadvantage. A machine would not be able to implement certain mechanisms of thinking based on human emotions and experience. Imaginably, an autonomous vehicle comes across an exhausted soldier in the desert who is not capable of fighting, but who holds a weapon. A man would most likely be able to establish that his fellow is not combat worthy. However, could a machine have the same faculty? Would the machine be able to recognise the surrender of the other party, which would have been shown in a different way from that accepted by international law? There is also a whole spectrum of activities unlegislated and non-legislatable (be it the unwritten customs of an informal ceasefire during the holiday season). Although artificial intelligence would be able to follow the written rules of international law in an exemplary way, there are doubts as to how it would deal with less obvious rules, including the nuances of customary law. The question also needs to be answered of whether an autonomous weapon will be capable of rapidly capturing and considering relevant developments in the environment and adapting its action to the new situation.

On the other hand, the potential algorithm of artificial intelligence application to those who violate the rules of armed conflict should also be considered. Is Artificial Intelligence entitled to defend against illegal activities on its own and not being culpable for the ensuing application of illegal methods, or should it rely on legal methods at all times to significantly weaken its own defence capabilities (and those of its human soldiers)?

²³ *Ibidem.*

Napoleon used to say that three things were needed to wage war. First money, second money and third money... Automated military systems will (and already are) extremely expensive. But it is in their algorithms that the problem of choice will have to be entered - human life (construed as our own soldiers here) *versus* highly expensive weapons. Whereas in civil applications it is more obvious, in military applications it is not. How to solve the following problem - should artificial intelligence sacrifice human life at the cost of very expensive military equipment, which in the future may save many more human lives than was originally sacrificed?

Moreover, a noteworthy risk arises of dilution of responsibility for warfare (and above all war crimes and violation of other rules of international law pertinent to armed conflicts). The use of new technologies, based essentially on self-learning algorithms, may exempt a human decision-maker from liability for the decision. A distinction must also be made between the liability of the operator of an autonomous vehicle and that of the administrator of that vehicle. The operator of an autonomous vehicle used for military purposes will usually be a soldier. In the case of vehicles used for military purposes, the dispatcher will be the state. It would therefore be advisable to determine who is actually liable for the operation of the autonomous vehicle. An operator who has made a specific decision, or a country which has resolved on employing artificial intelligence for military purposes? Or both, but to what extent?

5. SUMMARY

The issue of autonomous vehicles, dealt with in this paper, is closely related to the issue of artificial intelligence in general. Interest of people in artificial intelligence and attempts (often successful) to create new technologies, working in an intelligent way requires new legislation to be drafted. The laws applicable nowadays are often not adjusted to the needs of a fast developing world. In particular, they fail to solve legal problems linked to the operation of artificial intelligence. First of all, the scope of the terms used by lawyers needs to be redefined and supplemented. Common use of autonomous cars will require the definition of such issues as the concept of autonomy, the dispatcher of an autonomous vehicle, etc. Likewise, the *de lege lata* liability rules seem inappropriate for the use of autonomous vehicles. In this context, new legislation must be enacted, or the existing – modified accordingly. Although autonomous vehicles are currently in the testing phase, it is about time that we contemplated the prospective

law and gradually implemented new solutions. In today's world, new technologies are developing fast and at some point citizens can be confronted with a fait accompli, the autonomous vehicles driving on the roads. In view of the necessary relative legal certainty and public safety, the laws on autonomous vehicles should anticipate the actual operation of these vehicles on the roads.

It should also be mentioned that new technologies are developing most rapidly in terms of their use for military purposes. No in-depth reflection is required to conclude that the use of new technologies for military purposes (in particular artificial intelligence) should not remain outside the regulatory sphere. The use of autonomous vehicles, which may be a type of autonomous weapon, may pose a number of risks, in particular to the civilian population. Respectively, this issue must be addressed in international conventions. The use of artificial intelligence for military purposes may give rise to many doubts, not only legal but also ethical. This use should be discussed at international level. In particular, it is important to set clear limits in international law on the admissibility of new technologies. The obvious and irremovable problem here is, of course, that the subject of international law accepting and applying certain restrictions must also believe (and moreover have "technical" grounds for professing this belief) that so will do other important players...

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