Available online at www.sciencedirect.com

ScienceDirect

www.compseconline.com/publications/prodclaw.htm

Computer Law & Security Review

Liability for damages caused by artificial intelligence

Paulius Čerka [a], Jurgita Grigienė [a,*], Gintarė Sirbikytė [b]

[a] Čerka and Partners Advocates Bureau, Vytautas Magnus University, Faculty of Law, Department of Private Law, Kaunas, Lithuania

[b] Čerka and Partners Advocates Bureau, Kaunas, Lithuania

Keywords:
Artificial intelligence
Liability for damages
Legal regulation
AI-as-Tool
Risks by AI
Respondeat (respondent) superior
Vicarious liability
Strict liability

ABSTRACT

The emerging discipline of Artificial Intelligence (AI) has changed attitudes towards the intellect, which was long considered to be a feature exclusively belonging to biological beings, i.e. homo sapiens. In 1956, when the concept of Artificial Intelligence emerged, discussions began about whether the intellect may be more than an inherent feature of a biological being, i.e. whether it can be artificially created. AI can be defined on the basis of the factor of a thinking human being and in terms of a rational behavior: (i) systems that think and act like a human being; (ii) systems that think and act rationally. These factors demonstrate that AI is different from conventional computer algorithms. These are systems that are able to train themselves (store their personal experience). This unique feature enables AI to act differently in the same situations, depending on the actions previously performed.

The ability to accumulate experience and learn from it, as well as the ability to act independently and make individual decisions, creates preconditions for damage. Factors leading to the occurrence of damage identified in the article confirm that the operation of AI is based on the pursuit of goals. This means that with its actions AI may cause damage for one reason or another; and thus issues of compensation will have to be addressed in accordance with the existing legal provisions. The main issue is that neither national nor international law recognizes AI as a subject of law, which means that AI cannot be held personally liable for the damage it causes. In view of the foregoing, a question naturally arises: who is responsible for the damage caused by the actions of Artificial Intelligence?

In the absence of direct legal regulation of AI, we can apply article 12 of United Nations Convention on the Use of Electronic Communications in International Contracts, which states that a person (whether a natural person or a legal entity) on whose behalf a computer was programmed should ultimately be responsible for any message generated by the machine. Such an interpretation complies with a general rule that the principal of a tool is responsible for the results obtained by the use of that tool since the tool has no independent volition of its own. So the concept of AI-as-Tool arises in the context of AI liability issues, which means that in some cases vicarious and strict liability is applicable for AI actions.

* *Corresponding author*. Vytautas Magnus University Faculty of Law, Department of Private Law (Lithuania), Ožeskienės 18, LT-44246 Kaunas, Lithuania.
E-mail address: jurgita.grigiene@cerka.lt (J. Grigienė).

http://dx.doi.org/10.1016/j.clsr.2015.03.008

1. Introduction

Rapid technological change and development has led to an era of complex Artificial Intelligence (AI) technology and applications.[1] In addition to the positive effects of AI, such as increased production and indirectly lowered costs in factories and production lines, reduced potential of errors and increased efficiency, replacement of human labor in dangerous situations, etc.; but along with progress in technology come negative outcomes as well. Operation of AI is a new phenomenon that sometimes is not sufficiently understood. AI is different from conventional computer algorithms in that it is able to train itself on the basis of its accumulated experience. This unique feature enables AI to act differently in the same situations, depending on the actions previously performed. Therefore, in most cases the efficiency and potential of AI is rather unclear. Nevertheless, AI is increasingly being used in everyday life. Sometimes, people enjoy the benefits of AI without even realizing it (smart, self-training programs, such as Siri, bots, etc.).

The prevalence of AI in society means that the more people use AI, the greater the likelihood of various violations of law. Accordingly, AI development and its ever-growing practical use require changes in legal regulation, such as the need to restructure the legal system. If Artificial Intelligence turns out as planned, i.e. a thinking human-like robot with feelings and emotions, then the laws would need to be altered to encompass the roles of robots in society.[2] It means that lawmakers must review the existing legal framework and adapt it to the changing needs of society.

The increasing use of AI in the field of public activities leads to some challenges in the area of legislation. Daily use of IT, including AI, by the network society is different in its principles of operation from institutional, often bureaucratic, behavior. The operating system of IT and its integral part AI is spontaneous, constantly evolving and changing. For this reason, legislation governing this field should be: (i) universal in order to be effective, regardless of changes in information technology, or (ii) constantly amended in order to be effective, regardless of changes in information technology. However, the second option, i.e. constant change in legislation depending on changes in information technology, may be difficult to implement due to static and consistent nature of operation of institutions.

In 2012, the European Commission initiated a RoboLaw Project with the main objective of investigating the ways in which emerging technologies in the field of bio-robotics (including AI) bear on the national and European legal systems, challenging traditional legal categories and qualifications, posing risks to fundamental rights and freedoms that have to be considered, and more generally demanding a regulatory ground on which they can be developed and eventually launched. The most important outcome of the RoboLaw Project appeared on the 22 September, 2014. It consists of a final report containing "Guidelines on Regulating Robotics", addressed to the European Commission, in order to establish a solid legal framework for the development of robotic technologies in Europe.

However the problem of AI legal regulation has to be solved not only in Europe. It is obvious that while assessing the effect of accelerating globalization processes, the problem of AI cannot be limited by territoriality and its highlighting of different legal traditions practices. The lack of legal regulation in the field of AI is a problem for the global citizenship – all of network society, including civil law and common law countries as well. This problematic extends beyond national borders, which mean that it is not a problem of individual country or continent. This is a worldwide significance problem. For this reason we need not only the regional unification act of AI law, but the global one as well.

While the operation of AI is not regulated by specific legislation, we have to deal with the issue of liability for damages caused by the actions of AI. Legal norms provide that the damages caused by unlawful actions of others must be compensated. Legal norms provide that the damage is to be compensated by the offender or a person who is responsible for the actions of the offender. In view of these legal regulations and the fact that AI is not the subject of law yet, a question arises: who is required to assume liability and compensate damages caused by the actions of AI? This question, moreover, describes *the aim of the research*, i.e. to find out who is to be held liable for the damage caused by the Artificial Intelligence. *The object of the research* is the liability of Artificial Intelligence for the damages caused by its actions. *The methods of the research* are: information collection, systematizing, generalizing, valuation, comparison, analysis of scientific literature and legal acts, synthesis and deduction.

Some of the main questions to answer are: is AI capable of causing damage (is it possible that AI may be hazardous and may cause damage)? Can AI be held liable for its actions? What is the legal regulation to be employed in identifying the cases of compensation of damages caused by AI? Topics about AI in general and about the liability of AI for its illegal actions have been studied by some authors with differing conclusions.[3]

[1] Abdul Ahad Siddiqi, 'Implications of using Artificial Intelligence Technology in Modern Warfare' [2012] Communications and Information Technology (ICCIT), 2012 International Conference, 30; <http://www.taibahu.edu.sa/iccit/allICCITpapers/pdf/p30-siddiqi.pdf>.

[2] Richard C. Sherman, 'The Surge of Artificial Intelligence: Time To Re-examine Ourselves. Implications: Why Create Artificial Intelligence?', (1998) <http://www.units.muohio.edu/psybersite/cyberspace/aisurge/implications.shtml>'accessed 16.11.13.

[3] For example: David C. Vladeck, (2014); Ugo Pagallo *The Law of Robots* (2013); Ray Kurzweil, *The Singularity Is Near* (2005); Stuart Russell & Peter Norvig, *Artificial Intelligence Modern approach* (2009); Rymantas Tadas Toločka, *Regulated Mechanisms*(2008); Michael Aikenhead, *Legal Analogical Reasoning – the Interplay Between Legal Theory and Artificial Intelligence* (1997); Nils J. Nilsson, *The Quest for Artificial Intelligence. A history of ideas and achievements* (2010); Miglė Laukytė, *Artificial and Autonomous: A Person?* (2012); Marshal S. Willick *Constitutional Law and Artificial Intelligence: The Potential Legal Recognition of Computers as "Persons"* (985); Kathleen Mykytyn & Peter P. Mykytyn, & Jr. Craig W. Slinkman, *Expert Systems: A Question of Liability* (1990); Luke Muehlhauser & Anna Salamon, *Intelligence Explosion: Evidence and Import* (2012); Curtis E.A. Karnow, *Liability For Distributed Artificial Intelligences* (1996); Maruerite E. Gerstner, *Liability Issues with Artificial Intelligence Software* (1993); Erica Palmerini, *The Interplay Between Law and Technology, or the RoboLaw Project in Context* (2012); Geoffrey Samuel, *The Challenge of Artificial Intelligence: Can Roman Law Help Us Discover Whether Law is a System of Rules?* (2006); Stephen M. Omohundro, *The Basic AI Drives* (2007.