

# Artificial intelligence and healthcare ethics

## Introduction

Artificial intelligence (AI) is a field that affects all scientific fields of the 21st century, including healthcare. Artificial intelligence is a technology that uses algorithms - computer codes that can perform actions common to intelligent creatures. It can make decisions and perform tasks that a regular program cannot. AI is mainly used because of its high ability to analyse huge amounts of data sets in less time than a human. AI makes decisions based on defined goals and operates with varying levels of autonomy. There are several types of artificial intelligence, which include, for example, machine learning, which can recognize images or process signals. This type of artificial intelligence is already used in healthcare (World Health Organisation, et al., 2021).

The goal of the essay is to define and approach the issue of artificial intelligence in healthcare. Artificial intelligence, as a machine method, cannot make decisions for medical and non-medical personnel and determine the diagnosis by itself. On the other side, it can help in the diagnosis of malignant tumours, the development of vaccines or robotic surgery. Artificial intelligence has a lot to offer, but only under certain conditions – both legal and ethical.

## Artificial Intelligence

The first use of the term artificial intelligence dates to 1956. Researchers assumed that any aspect of learning or other feature of intelligence could be manufactured as a machine and simulate intelligence. At the beginning, the processes that can be attributed to intelligent behaviour were identified. This includes, for example, chess, mathematics, language processing or medical diagnosis. The goal was to automate processes close to humans. Nowadays, however, most artificial intelligences are not human-like and deliberately bypass human behaviour (Dick, 2019).

Artificial intelligence is a field that can combine engineering, computer science, and related fields to create a device/tool that would normally require an intelligent operator. AI will ensure that the device is going to function autonomously. In the healthcare world, this means image recognition, speech, language translation or biosignal analysis. The biggest ethical issues were data privacy and security, trust in AI, accountability and responsibility and bias (Murphy, et. al., 2021).

Artificial intelligence is a part of industrial revolution 4.0 as part of the digitalization and automation of processes. AI promises to improve healthcare systems and the health of individuals and population. Unfortunately, AI also raises ethical issues, such as privacy, trust, and liability concerns. These ethical issues are complex and vast. The potential for AI to improve health systems is high, but it needs to be implemented cautiously (Murphy, et. al., 2021). The potential for multiple uses of AI in healthcare is high, as it has the potential to update healthcare and improve outcomes.

Products of artificial intelligence are widespread these days. However, users feelings are mixed due to ethical stances. Key ethical stances are prejudice against AI, consumer privacy, cybersecurity, and individual autonomy. The extent to which AI technology can be morally good or bad depends primarily on the human decision-making processes that teach the AI to make decisions. This would suggest that the person who taught the AI is solely responsible for the technology. It is also beginning to be thought that AI technology has a profound effect on the ethical decision-making of human beings. It has already been proven that technological products actively influence their users decisions and perception of the world and how they act in it. Negative effects on users have been documented, including aggressive behaviour, addiction and stress (Du, et. al., 2021).

Inappropriate use and misinterpretation of artificial intelligence information in healthcare can result in the death of a patient. This is important to realize because patients come to the doctor at difficult times in life. Currently, there are no legal regulations that would address the issue of law and ethics of using artificial intelligence in healthcare. It is important to remember that technology is not responsible for its actions unlike doctors. The doctor will always need to be able to justify his treatment actions, even if it is based on AI decisions. Therefore, every doctor must be properly trained in its use and have responsibility for its use (Naik, et. al., 2022).

The overall digitization of the world, including healthcare, has brought many new technologies. From digital technologies, artificial intelligence has brought many benefits to humanity, related to solving complex problems that are beyond human intelligence. AI can perform many tasks in a short amount of time at minimal cost. Healthcare is probably the most sensitive sector to the uncontrolled use of artificial intelligence, such as surgical robots or image recognition algorithms. The education of medical and non-medical personnel is also critical here, which is not sufficient. There is a need to integrate fields with each other because AI is not a purely technical matter (Saheb, et. al., 2021).

Incorporating machine learning into the healthcare environment will lead to improvements in healthcare delivery. Knowledge of machine learning tools for big data analysis is also related to this. Algorithms that are already used outside of healthcare have shown errors such as racial discrimination. These problems need to be avoided so that they are not implemented even in a medical facility. Algorithms can also be designed in an unethical way. Differences between the design intent of a machine learning system and the users goals can create ethical pressure. Failure to design machine learning systems to be constructed as a black box can lead to ethically problematic results. Medical ethics will have to adapt. The implementation of machine learning will require a rethinking of the basic principles of professional ethics (Char, et. Al., 2018).

### **How to use artificial intelligence?**

There were several cyber attacks on hospitals in the Czech Republic in 2021. Hospitals are constantly trying to improve their security, but they are still an easy target for hackers. Artificial intelligence can help improve the impact of cyber attacks on hospitals. AI can more quickly and easily identify vulnerabilities in systems that may be invisible to experts. Crucially,

AI is excellent at evaluating system robustness, system resilience, and system responsiveness. It can also process data faster and more accurately, thus helping to get rid of boring work (Taddeo, 2019). Cyber security is a very sensitive and hot topic these days. AI could help a lot in this area. On the contrary, it is important to choose the right AI system.

AI can also diagnose skin cancer with greater accuracy than a certified dermatologist and in a faster manner. To be able to do this, a training data set is needed, which the AI program must learn/train. Given this way, it might seem that medical staff will soon be unnecessary. This is where an ethical dilemma arises. Artificial intelligence can be applied to virtually any medical field. It is used in biomedical research, medical education and even the provision of health care. Unfortunately, ethical challenges such as safety, privacy and patient preferences arise with it. Current ethical guidelines for the use of AI stagnate behind the progress that artificial intelligence has made. The rapid integration of AI into healthcare has brought opportunities to improve the efficiency of healthcare delivery. On the contrary, possible risks to patient autonomy, such as threats to privacy and confidentiality, must be minimized. It is also possible to use artificial intelligence in the education of doctors and medical students (Rigby, 2019).

In the healthcare industry, there is an ever-increasing amount of data that needs to be processed, for which AI can be of great help. Machine learning methods and neural networks can be used especially for healthcare. It is about training models on data. Machine learning is one of the most widespread forms of AI. For healthcare, prediction models are most often used - predicting what will happen. This form always takes place as tutored learning, where the artificial intelligence is given a training data set for which the resulting variable is known. More complex systems are neural networks, which work on the principle of weighting variables, inputs and outputs. The most complex systems are deep learning systems, for example the recognition of cancer lesions during radiodiagnosis. From an ethical point of view, the most difficult issue here is transparency, as many AI algorithms are impossible to interpret or explain. It will be necessary to explain to patients the basis of their diagnosis. There will also be misdiagnoses with AI for which accountability needs to be determined (Davenport, et. al., 2019).

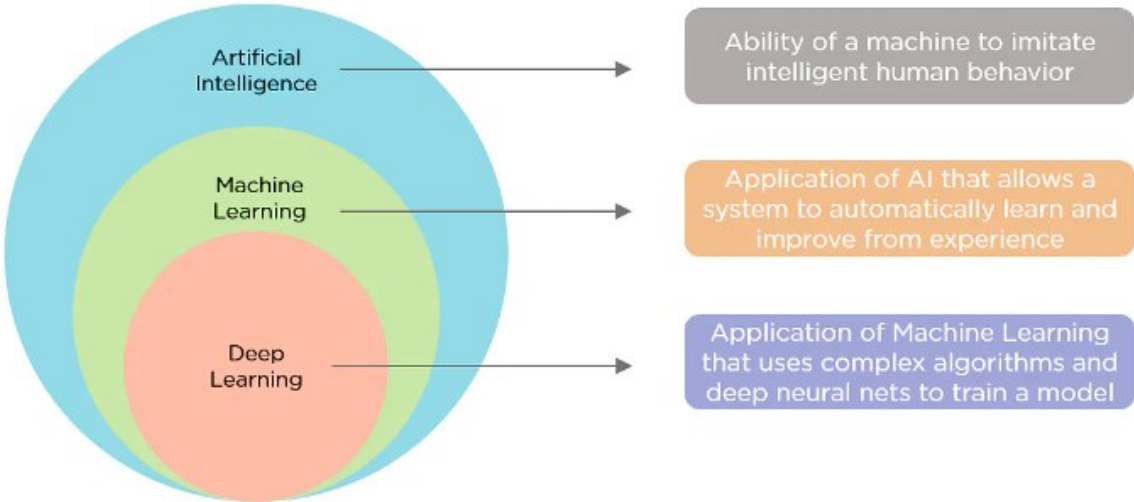


Figure 1 Differences between AI vs. Machine Learning vs. Deep Learning (Mohan, 2022)

More and more algorithms, such as deep learning or neural networks, are emerging for healthcare. All these areas are intensively researched and are looking for new uses in areas such as diagnostics and imaging, risk analysis, lifestyle monitoring or virtual medical assistance. Artificial intelligence will find application in predictive screening or diagnosis of rare diseases. The idea behind artificial intelligence is to reduce healthcare costs and increase efficiency. Machine learning relies on vast amounts of healthcare data to train neural networks. However, the data that is used for this learning is the property of the patient and it is necessary to inform them correctly and obtain consent for processing. Consent plays an important role, as it is a confidential patient/doctor relationship, which is based on the ethical obligations of the health professions. It would be appropriate to consider the possibility that consent may be a dynamic process that may change over time.

Enthusiasm for artificial intelligence can lead to insufficient exploration of the technology and premature implementation without proper ethical guidance. Current algorithms also lack complete data transparency and the decision-making process. Related to this are problems with explainability and societal prejudices.

Another issue concerns the ownership of the data on the basis of which the entire algorithm is developed. Will the owner be solely the doctor or the company that manages the development of the algorithm? What happens when a patient changes medical facilities? Will his data be available to the new workplace as well? Institutions are expected to prioritize the patient over the harm of healthcare discontinuity (Racine, et. al., 2019).

One of the biggest dilemmas of AI is the explainability of the processes inside the program. AI often overcomes analytical tasks relatively easily than humans. However, the lack of explainability of how it does this has drawn criticism. Explainability is not only technological, but also legal, ethical, social and medical. To ensure that artificial intelligence is used in healthcare, there is a need to ensure and encourage multidisciplinary collaboration between healthcare professionals and artificial intelligence developers (Amann, et. al., 2020).

Research from the United Kingdom found that more than half of respondents disagreed with the use of personal data to improve healthcare with AI. It is unnatural for them that these systems replace medical and non-medical personnel in their usual tasks. In contrast, the exponential increase in investment in machine learning suggests that artificial intelligence will be part of healthcare and deserve the trust of patients and acceptance by providers (Vayena, et al., 2018).

## **Conclusion**

All the studies say that ethics and artificial intelligence is a very hot topic that will need more attention. If there is interest from providers and creators of healthcare integration algorithms, greater algorithm transparency will be needed. This is to make the results easier to grasp and interpret. Artificial intelligence is not supposed to serve as a brain, but as a tool and help in difficult decisions. But it is always necessary to rely on our intuition and education, both on the part of doctors and on the part of non-medical personnel. Artificial intelligence helps to process data much faster than a human, which can be beneficial in the huge amount that healthcare generates. The issue here is who owns the data itself and the resulting learned algorithm. Artificial intelligence is already being used in healthcare as robotic operations that reduce the complexity of the operation and the overall burden on the patient. The patient stay on the bed is then shortened and thus the costs in the healthcare sector are reduced. AI helps with the training of doctors by helping them to identify non-physiological formations in an endoscopic image. It also helps with the interpretation of the ECG waveform and suggests possible variants of the problem. These are just examples of the possible use of AI in healthcare, and more are waiting for future application and use. We can also look at the issue of artificial intelligence from the other side, namely that not using artificial intelligence can be an unscientific and unethical approach.

Artificial intelligence is a field that will increasingly come to the fore. Investment in the development of artificial intelligence applications in healthcare is unstoppable. The problem with AI so far is that each system is unique and needs to be solved uniquely. Each algorithm should be more transparent to make it easier for medical staff to interpret.

Every healthcare organization should use the available technologies to treat their patients with the best awareness. Perhaps not using artificial intelligence in healthcare is unscientific and unethical.

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