

Proceeding Paper

A World Worth Living—Can Artificial Intelligence Help to Reach the Goal? †

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† Presented at the online workshop Digital Humanism: How to shape digitalisation in the age of global challenges? IS4SI Summit 2021, Online, 12–19 September 2021.

Abstract: Artificial intelligence (AI) is an area of computer science that has received much attention in the public media, politics and economy. There is a worldwide expectation that AI will be a key technology for the future. In this short paper, I sketch and discuss whether the prospects and hopes are realistic from a technical point of view and under which conditions AI will contribute to the welfare of human beings.

Keywords: artificial intelligence (AI); digital humanism; technology and society

1. Introduction

Artificial intelligence (AI) is an area of computer science that has received much attention in public media, politics, and economy. There is a worldwide expectation that AI will be a key technology for the future. In this short paper, I sketch and discuss whether these prospects and hopes are realistic from a technical point of view and under which conditions AI will contribute to a world worth living in—a goal that is described in Section 2. In Section 3, it is recalled that science and technology are driving forces for the development of human societies, where digitization and artificial intelligence play a more important role in this respect in more recent times. In Sections 4–7, the current hype about AI is referred to, the major methods of AI are sketched, the relation between AI and human intelligence is broached, and typical applications of AI are pointed out. The title question is tentatively answered in the concluding section.

2. A World Worth Living

In my view, a world worth living is a peaceful world without poverty, hunger, human exploitation and destruction of nature, a world with equal rights and equal opportunities for all people. It enjoys a sustainable economy and a sustainable way of life. Moreover, the use of technologies is compatible with these goals.

As far as digitization is concerned, this characterization may be considered as equivalent to the ideas of digital humanism (cf. [1,2]). I avoid this term as far as possible because it refers rather to digitization under the conditions of humanism while humanism cannot be digital in itself, if my understanding of the meaning of “digital” is correct.

3. Science and Technology

In combination with societal structures, culture, and economy, science and technology have been essential factors in the development of human civilizations for thousands of years. This development received a big push from industrialization over the last 250 years and a further push by computerization and digitization for over last 70 years, which is reaching a new level via the creation artificial intelligence (AI) and robotics more recently. Therefore, one may ask: can AI help to make the world worth living? It should not be surprising that the answer is not just YES or NO; rather, it depends.



Citation: Kreowski, H.-J. A World Worth Living—Can Artificial Intelligence Help to Reach the Goal? *Proceedings* **2022**, *81*, 108. <https://doi.org/10.3390/proceedings2022081108>

Academic Editor: Wolfgang Hofkirchner

Published: 5 April 2022

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4. AI Hype

Over the last two decades, one can encounter quite some spectacular successes of AI in gaming (chess, Go, poker, jeopardy, ...) as well as in more practical applications such as language and picture processing. Moreover, some AI experts continue to promise further breakthroughs. Both facts trigger the expectations in politics and economy that AI will become a key technology in the future of future surplus value and—sometimes—even of world leadership (cf., e.g., [3]). Many states have national AI strategies (see, e.g., [4,5]) and are going to invest huge amounts of money developing AI. One wonders about the directions that these developments may take.

5. AI Methods

Although the area of AI is subdivided into a wide spectrum of topics, they share some basic methods and principles (cf., e.g., [6]). One of the major methods exploited in AI is the use of rules. The kinds of rules include arithmetic laws (e.g., the commutativity $a + b = b + a$), logic laws (e.g., *if a implies b and a is true, then b is true*), grammar rules (e.g., *a sentence may consist of a subject, a predicate and an object*), rules of games (e.g., chess, ludo, bridge, etc.) and logical puzzles (e.g., sudokus, labyrinths, etc.). While these well-known kinds of rules are usually simple in structure and small in number, an AI system may consist of a very large number of partly very sophisticated rules. Nevertheless, the basic principles and uses are alike. They can be applied to underlying discrete information structures performing local changes and provide complex transformations and computations by iteration.

A further major method frequently employed in AI is probability theory and variants to describe uncertainty, vagueness, fuzziness and the like as encountered in many practical and real-world applications.

It is interesting to take note of the fact that machine learning (including so-called deep learning), as one of the most important subareas of AI, combines both main methods in such a way that impressive progress is made in prediction and prescription in a wide range of applications compared to the more classical fields of AI.

The most favored AI principles are known for decades and quite similar to methods used in other areas of computer science and even beyond. The main difference is that the scientific communities are different and do not know much about each other. The notable recent successes of AI are achieved in large part by the growing speed of computation and the growing storage capacities that allow the provision of huge amounts of big data and make ambitious projects possible. In other words, there is no magic, and there are no disruptive innovations. To be fair, I agree that AI has made remarkable progress, but I argue that this due to ordinary scientific and technological reasons.

6. What about Intelligence?

The major part of AI is referred to as 'weak AI'. Its goal is the simulation of limited processes for which human beings use their intelligence such as playing games, logical deduction, problem solving, language understanding, picture recognition, planning, decision making, etc. One should be aware that there is no big difference between weak AI and computer science in general. The emphases of the latter lay on computing, data storing, searching, sorting, controlling, managing, administrating, routing, etc., as these are all activities for which human beings need their intelligence, too.

How is this kind of simulation of intelligent behavior in very restricted contexts related to natural intelligence and to human intelligence, in particular? There is no final answer, as the functioning of natural intelligence is not fully understood. However, on the phenomenological level, big differences can be seen. Let us consider, for example, the AI concept of 'deep learning'. Nothing is really deep about it. It is based on artificial neural networks with multiple layers between the input layer and output layer (deeply stacked). The 'learning' of such a network is rather 'training' by 1000s and 1000s of input data samples of whatever should be 'learnt'. Typical examples are pictures of cats and dogs

or—more practically—of dermal cancers. In contrast to that, humans and even very young children usually only need very few samples to learn something. Moreover, learning takes place all the time and concerns a wide spectrum of topics simultaneously.

In contrast to weak AI, the proponents of ‘strong AI’ (or artificial general intelligence) aim at systems that behave intelligently in the same way as humans behave intelligently. Some of them even strive after superintelligent systems that are more intelligent than humans—a popular topic in fiction (cf., e.g., [7–9]). But, as far as I can see, there is not the least indication yet that this may come true soon or at all. Most authors, such as those of [10], agree with my opinion.

7. AI Applications

Since, all over the world, a lot of money is available for the development of AI technologies, many applications are in progress and planned. A good portion of these look promising. AI—including robotics—is already used in medicine, production, transportation, etc., with some success. Moreover, many prototypical applications are under development, such as autonomous vehicles, service robots, and many more. However, several of them are in obvious contradiction to a world worth living. There are applications that increase the profit of private companies and nothing more, that consume large amounts of energy, that are used for social surveillance (in the small and large scales), that increase the horror of war by autonomous lethal weapons, drone swarms, and various further military applications.

8. Conclusions

Can AI help to make the world worth living? There is and will be a lot of money to be spent in AI. There are thousands and thousands of active AI researchers, engineers, developers, and managers who will take and spend this money and produce plenty of outcomes of all kinds. This includes AI applications that make the rich richer and powerful people more powerful. It also includes AI-based social surveillance undermining human rights, as well as new and horrible AI-based weaponry. The attitude of many AI experts is arrogant and ignorant. They avoid not only considering and respecting the limits of AI, but also develop whatever is required and paid for. They ignore the fact that AI algorithms and AI systems are often uncontrollable and inscrutable, making them dangerous and risky. Ethical aspects play a minor role, if at all. The expectations in politics and economy are exaggerated, as they do not take into account that the development of technology is a slow process, can fail, often costs much more than calculated at the beginning and the results may not meet given promises. Furthermore, AI is not the only cutting-edge technology. It may be necessary to be considered in the context of bio- and nano-information technology as a whole (cf., e.g., [11]). All this indicates the answer NO.

Nevertheless, the answer can be YES if all efforts are directed toward the goal. This requires a dramatic change of the framework conditions, guidelines, and aims of politics and the economy. It depends very much on the way technologies such as AI are further developed and employed. The leaders of the world on the one hand and scientists and engineers on the other hand must obey Hans Jonas’ imperative of responsibility [12]: “Act so that the effects of your action are compatible with the permanence of genuine human life.” One should be aware that global challenges in the form of climate change, the division between the poor and rich, the violation of human rights in many states, and the world-wide arms race cannot be coped with by relying on technology only.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Data Availability Statement: Not applicable.

Acknowledgments: I would like to thank Sabine Thürmel and the anonymous reviewers for their helpful comments.

Conflicts of Interest: The author declares no conflict of interest.

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