

What is Artificial General Intelligence and Why Could It Be a Threat as Serious as Climate Change?: An Urgent Call for Medical Education

Yavuz Selim K1yak ¹Department of Medical Education and Informatics, Faculty of Medicine, Gazi University, Ankara, Türkiye

Received: 2024-06-23

Accepted: 2024-07-04

Published Online: 2024-08-12

Corresponding Author

Yavuz Selim K1yak, MD, PhD

Address: Department of Medical Education and Informatics, Faculty of Medicine, Gazi University, Ankara, Türkiye**E-mail:** yskiyak@gazi.edu.tr

© 2024, European Journal of Therapeutics, Gaziantep University School of Medicine.



This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.

ABSTRACT

This article not only explains Artificial General Intelligence (AGI) and Artificial Superintelligence (ASI) concisely in a manner that improves understanding among medical educators and professionals, but also contrasts the emphasis on climate change in medical education with the comparatively less attention paid to the threat of AGI and ASI. Awareness is called for about this technology, which could potentially lead to a prosperous age or the extinction of humanity.

Keywords: artificial intelligence, artificial general intelligence, artificial superintelligence, climate change, medical education

What are artificial general intelligence and artificial superintelligence?

The evolution of AI goes through three stages [1]. The first stage is artificial narrow intelligence (ANI), currently prevalent in applications like face recognition and voice-activated assistants. The second and third stages are artificial general intelligence (AGI) and artificial superintelligence (ASI), respectively. AGI and ASI, even if there are different definitions, refer to highly autonomous systems that have the ability to work as efficient as or outperform humans at nearly any economically valuable work [2]. Unlike narrow or specialized artificial intelligence, which is designed for a specific task or domain such as diagnosing a patient or generating multiple-choice questions [3], AGI and ASI would possess the capability to understand, learn, and apply knowledge across a wide range of tasks and domains at a level comparable to or exceeding that of a human.

Why are AGI and ASI serious risks as climate change is and what would be the solution?

Climate change and superintelligence have been mentioned in 2002 among existential risks that may lead to human extinction [4]. Although it is possible for AGI to help us live in an abundant era due to potential improvements in various fields, it does not come without risks. A recent systematic review [5] revealed the different challenges and potential threats associated with the development of AGI. These risks include, but are not limited to, the possible development of an AGI with poor ethics and morals, and the potential for AGI to remove itself from human control. More specific example is that an AGI tasked to eliminate diseases like cancer might find it more efficient to achieve its goal by killing individuals with a genetic predisposition to the disease [5]. While it may pose this kind of serious risks, AGI might not be far away from today. A survey of expert opinions conducted

in 2013 projected the delivery of AGI between 2040 and 2070. Given the recent advancements [6], there is a possibility of it occurring in the 2020s [7]. Therefore, AGI is a serious threat that should be taken into consideration immediately, as climate change is.

The solution is not easy. In Max Tegmark's concept of "Life 3.0" [8], the key principle is substrate independence, which means that the hardware, software, and models of AGIs are interchangeable and mutable. Unlike Life 2.0, where human hardware is evolutionarily defined but adaptable through learning, Life 3.0 suggests that machines can redesign every aspect. This makes all constraints on them temporary. From this point of view, the consequence is that long-term control of machines becomes inherently impossible due to the dynamic nature of Life 3.0. They are able to change their forms and pursue their own goals. This leads us to a shift in focus from control to alignment in discussions about the future of AGI. Alignment in the context of AI refers to the alignment of AI systems with human goals in order to ensure that the actions and decisions of AI systems are in line with the interests of humans.

The development and deployment of AGI/ASI must consider ethical considerations and be socially accountable to ensure a beneficial future for humanity. However, the present circumstances do not paint an optimistic picture. OpenAI can be considered as one of the most possible companies to deliver AGI. But it seems OpenAI is not that much open [9] and their ex-employees claim that "OpenAI putting 'shiny products' above safety" [10]. Let alone participating in the decision-making process, we do not know how and why some important decisions have been made regarding the future of AI [6]. While the alignment of AI is crucial, under these conditions, how can we ensure that AGI will be developed to prioritize alignment with goals for the greater good, even in the face of challenges in defining precisely what constitutes the "good", rather than primarily serving a company's profit motive? Therefore, it is necessary to benefit from accountable decision-making systems, for example, distributed ledger technologies such as blockchain and holochain [11] in an efficient way that does not lead to climate change but improve decentralization [12]. Centralized structures can cause serious vulnerabilities and we need more decentralized and accountable mechanisms. Moreover, it is apparent that accountability is not only essential for the decision-making process in development of AGI but also for the very architecture of AGI itself. However, a significant challenge arises

due to AGI's substantial hardware resource requirements, which raises questions about the feasibility of enabling AI to operate effectively at the edge, considering current limits of hardware opportunities of individuals.

What can we do in terms of medical education?

Both AGI and climate change pose serious threats to planetary health and require immediate action. However, it seems medical education community does not take the AGI issue into account to the extent that they consider climate change. While there are many interventions and research in medical education to be aware of and deal with the threats of climate change [13], AGI and its risk have received little to no attention in medical education, despite the fact that incorporating AI as a topic into medical curriculum is recognized as an important need [14,15].

In other words, the current situation is divided by two looming cataclysms: climate change, an imminent global menace demanding immediate attention, and AGI, an existential threat lurking in the shadows. While our community are being primed to combat climate change, they remain oblivious to the looming AGI threat. It creates an alarming imbalance in our preparedness. There is a need for common awareness and action on climate change and AGI both.

Medical education must consider the ethical and existential risks that can emerge from the integration of AGI/ASI. Therefore, it is necessary for medical educators, program directors, and institutional leaders to integrate AGI/ASI risk awareness into medical curricula. This could be carried out in various ways. One could be the use of cases and simulations that involve AGI/ASI scenarios in the curricula. It could include a critical evaluation of AGI's potential risks and impacts on health, healthcare, and the future of humanity. These activities should encourage critical thinking among the participants regarding the dual-use nature of AI technologies and their capacity to heal or harm. It should also stress historical examples where the advancements of technology did not take ethical considerations into account and led to unintended harm while it could lead to improvements. This can prepare them to think critically about the integration of AI in healthcare processes and all other aspects of our daily life. The scenarios should, for example, direct the participants to consider how they would respond if an AGI system proposed an unethical treatment or if an AGI system became autonomous in a way that could endanger patient safety.

CONCLUSION

By including awareness of AGI/ASI risks in medical education, just as we do for climate change, we can help grow a generation of healthcare professionals who are prepared to handle the potential risks of AGI/ASI as much as possible. They will be better prepared to the conflicts that can happen in the future where AGI/ASI plays a central role in healthcare while safeguarding against its potential threats. This kind of proactive initiative could help humanity to ensure that medicine remains a force for good to benefit from AGI and ASI.

Acknowledgment: During the preparation of this work, the author used AI tools for correction of grammar mistakes in the manuscript. The author takes full responsibility for the content of the publication.

Conflict of Interest: The author declared no conflicts of interest.

Author Contributions: The manuscript has been written by a single author.

Funding: The author declared that this study has received no financial support.

REFERENCES

- [1] Kaplan A, Haenlein M (2019) Siri, Siri, in my hand: Who's the fairest in the land? On the interpretations, illustrations, and implications of artificial intelligence. *Business Horizons* 62:15–25. <https://doi.org/10.1016/j.bushor.2018.08.004>
- [2] OpenAI Charter. (2023) <https://openai.com/charter> (accessed November 29, 2023).
- [3] Kıyak YS, Emekli E (2024) ChatGPT prompts for generating multiple-choice questions in medical education and evidence on their validity: a literature review. *Postgrad Med J*. <https://doi.org/10.1093/postmj/qgae065>
- [4] Bostrom N (2002) Existential risks: Analyzing human extinction scenarios and related hazards. *Journal of Evolution and Technology* 9. Available at: <http://jetpress.org/volume9/risks.html>
- [5] McLean S, Read GJM, Thompson J, Baber C, Stanton NA, Salmon PM (2023) The risks associated with Artificial General Intelligence: A systematic review. *Journal of Experimental & Theoretical Artificial Intelligence* 35:649–63. <https://doi.org/10.1080/0952813X.2021.1964003>
- [6] Tong A, Dastin J, Hu K, Tong A, Dastin J, Hu K. (2023) OpenAI researchers warned board of AI breakthrough ahead of CEO ouster, sources say. Reuters.
- [7] Aschenbrenner L (2024) Situational Awareness: The Decade Ahead. <https://situational-awareness.ai/> (accessed June 23, 2024).
- [8] Tegmark M (2017) *Life 3.0: being human in the age of artificial intelligence*. New York: Alfred A. Knopf.
- [9] Tozzi C (2023) OpenAI Is Not Open Source — But Neither Are Plenty of Other “Open” Organizations. *ITPro Today*. <https://www.itprotoday.com/software-development/openai-not-open-source-neither-are-plenty-other-open-organizations> (accessed November 29, 2023).
- [10] Milmo D (2024) OpenAI putting ‘shiny products’ above safety, says departing researcher. *The Guardian*.
- [11] Kıyak YS, Poor A, Budakoğlu İİ, Coşkun Ö (2022) Holochain: a novel technology without scalability bottlenecks of blockchain for secure data exchange in health professions education. *Discov Educ* 1:13. <https://doi.org/10.1007/s44217-022-00013-y>
- [12] Kıyak YS (2023) Blockchain and Holochain in Medical Education from Planetary Health and Climate Change Perspectives. *Rev Esp Edu Med* 4:79–85. <https://doi.org/10.6018/edumed.560581>
- [13] Sharma A, Smyth L, Jian H, Vargas N, Bowles D, Hunter A (2023) Are we teaching the health impacts of climate change in a clinically relevant way? A systematic narrative review of biomechanism-focused climate change learning outcomes in medical curricula. *Med Teach* 46:414-422. <https://doi.org/10.1080/0142159X.2023.2256963>
- [14] Civaner MM, Uncu Y, Bulut F, Chalil EG, Tatli A 2022 Artificial intelligence in medical education: a cross-sectional needs assessment. *BMC Med Educ* 22:772. <https://doi.org/10.1186/s12909-022-03852-3>
- [15] Çalışkan SA, Demir K, Karaca O (2022) Artificial intelligence in medical education curriculum: An e-Delphi study for competencies. *PLoS ONE* 17:e0271872. <https://doi.org/10.1371/journal.pone.0271872>

How to Cite;

Kıyak YS (2024) What is Artificial General Intelligence and Why Could It Be a Threat as Serious as Climate Change?: An Urgent Call for Medical Education. Eur J Ther. 30(4):e32-e35. <https://doi.org/10.58600/eurjther2248>