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## Call for urgent regulations on artificial intelligence

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### Abstract

AI is extraordinarily useful technology but it is becoming increasingly powerful with rapidly growing capabilities to disrupt and harm human society. We call on international and national organizations and individuals to join forces in banning the development of superintelligent AI and introducing regulations to prevent and mitigate AI-caused harm.

### Full Text

#### Call for Urgent Regulations on Artificial Intelligence

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### Abstract

AI is an extraordinarily useful technology, but it is becoming increasingly powerful with rapidly growing capabilities to disrupt and harm human society. We call on international and national organizations and individuals to join forces in banning the development of superintelligent AI and introducing regulations to prevent and mitigate AI-caused harm.

## Introduction

AI has clearly emerged as a very powerful technology. As with any transformative technology—such as nuclear power, chemical technology, or biotechnology—it can be used for both peaceful, ethical purposes and for unethical applications, including the creation of weapons.

While treaties and regulations govern mature technologies, such as prohibitions on human cloning and the development of nuclear, chemical, and biological weapons of mass destruction, no comparable regulations exist for AI development. This is deeply concerning given AI's destructive and disruptive capabilities and the rapid pace of its advancement.

While humanity is capable of many things, this does not mean we should pursue them all. Our task is to establish clear boundaries for what we can do and, more importantly, to delineate what we should not do. In the field of AI, no such boundaries currently exist—a situation that invites unmitigated disaster.

At present, only non-binding appeals by researchers and tech entrepreneurs exist to limit AI's use in weapons development<sup>1</sup> or to halt the creation of AI models more powerful than GPT-4<sup>2</sup>.

To prevent or at least ameliorate harm from AI, we call for immediate action: introduce an international ban on the development of superintelligent AI that is vastly more intelligent than human society in its entirety and the brightest human minds, and form an international committee to regulate AI development and use.

Below, we elaborate on how AI can continue to be used for the betterment of our lives, what risks unregulated AI development poses, and what steps are required to ensure its responsible use.

## AI Can Be Good...

In the modern era, artificial intelligence has become an essential part of our lives. AI enables smart homes with AI-powered devices (thermostats, lighting systems, etc.), personal assistants such as Alexa and Siri, self-driving cars, and improved user experiences on web platforms.

Furthermore, AI can enhance efficiency and productivity by optimizing methods, improving decision-making, forecasting trends, increasing accuracy and precision, simplifying maintenance, reducing costs, and improving traffic flow in cities, healthcare systems, and customer service. In scientific research, AI is enhancing our understanding of the natural world, accelerating discoveries, and ultimately improving quality of life. In our own research, we have greatly benefited from using AI to develop faster and more accurate physically-motivated models that enable solutions to problems in chemistry and physics<sup>3–6</sup>.

## ...and Harmful

Despite these appealing aspects, the shift toward an AI-dependent society carries many negative impacts:

**Unemployment:** AI has already replaced and may continue to replace workers in manufacturing, customer service, laboratory work, medical professions, and other industries. According to recent economic analysis, approximately 300 million jobs will be affected by AI<sup>7</sup>.

**Over-dependence:** Increased reliance on AI may lead to the loss of critical thinking, creativity, and innovation.

**Dehumanization:** AI-empowered machines may perceive humans merely as data points, devoid of empathy and compassion.

**Social seclusion:** Research on social media's negative impacts has reported reduced in-person social interaction among U.S. adolescents in the 21st century<sup>8</sup>. Over-dependence on AI could worsen this phenomenon, leading to loss of social cohesion and community.

**Biased outcomes:** AI models can exhibit bias, such as associating Muslims with violence<sup>9</sup>. When used in decision-making, AI can lead to discrimination in hiring, lending, rental services, and customer support.

**Security risks and sensitive information access:** AI applications in self-driving cars and smart homes raise security concerns, as they can be hacked, leading to sensitive information leaks and risks to human life. Recent studies have reported leakage of potentially sensitive user information from some smart home devices on the market<sup>10</sup>. Cybersecurity vulnerabilities in autonomous vehicles could enable new forms of car theft, intentional accidents, and even facilitate robbery and assault<sup>11</sup>.

**Privacy:** Since AI systems are data-dependent, they often require extensive personal data for training, which could be used for unsolicited commercial or unethical purposes. Recently, Italy became the first European country to ban ChatGPT over privacy concerns<sup>12</sup>.

**Use in weapons:** The integration of AI systems into modern warfare has drawn significant military attention, exemplified by the United States Army's Future Combat Systems project, which aims to develop a deployable "robot army"<sup>13</sup>. The current Russian-Ukrainian war has provided a glimpse of potential AI-empowered weapons<sup>1</sup>. Such weapons raise global concerns about enhanced speed and lethality, potentially sparking a new arms race. AI-empowered weapons cannot replicate human empathy, judgment, and intuition in complex situations, raising ethical questions about autonomous life-and-death decision-making. They may misunderstand human culture and values, potentially harming innocent people, and malfunctioning AI weapons could cause atrocities with unclear accountability.

**Other concerns:** Should AI be permitted to make health, life, and death decisions in civilian settings, such as in medicine (robotic surgeons, diagnosis, prescription) or autonomous vehicles (when a crash is unavoidable, whose life should be prioritized—passengers or pedestrians)? In education, should AI eventually replace teachers, and to what extent should AI use by students and teachers be permitted? How do we resolve intellectual property issues when AI is trained on copyrighted human work? How much should AI know about us, and how can we protect our data and privacy? How many resources should we allocate to AI, given that training large language models leaves a substantial carbon footprint<sup>14</sup>? How human-like should we make AI, given its potential for manipulation<sup>15</sup>? Should researchers use AI to write papers<sup>16–17</sup>? Can AI get out of control?

We argue that recent developments such as ChatGPT provide only a glimpse of AI’s future capabilities. The stakes are too high: if AI becomes vastly more intelligent than humans, we will have minimal control over this technology and our own destiny. There is no guarantee that superintelligent AI will serve humanity’s benefit.

Some skeptics claim that machines will never reach such a stage and that we will always maintain control. One article even described current ChatGPT as merely a “blurry JPEG of the Web” with many limitations<sup>18</sup>. This is wishful thinking, reminiscent of historical examples where even brilliant humans failed to recognize that today’s impossibilities may become tomorrow’s realities. In 1895, Royal Society President Lord Kelvin famously declared that “heavier-than-air flying machines are impossible,” and more recently, people doubted whether AI could play Go better than humans<sup>19</sup>. Similarly, in a decade or two, we may look back at current AI models like ChatGPT or GPT-4 as we now view early 1970s computers. It is crucial to understand AI’s positive and negative societal impacts and recognize our responsibilities before AI spirals out of control. Therefore, in this opinion paper, we call for banning superintelligent AI development that threatens societal order. This ban is absolutely essential until we better understand the technology’s dangers and develop control mechanisms.

## AI Raises Existential Questions

As noted above, AI could potentially replace hundreds of millions of workers<sup>7</sup>, raising important societal and even existential questions. AI creates impressive artwork and can write books over a weekend. In science, AI already performs highly complex work, proving mathematical theorems better than the best mathematicians<sup>20</sup>, and one study claims AI has achieved “emergent autonomous scientific research capabilities” for chemistry<sup>21</sup>. We can imagine AI eventually surpassing the best human scientists, engineers, programmers, and artists. No occupation is safe. We pride ourselves on being the most intelligent beings, but this status may soon end. Do we, as humans, want machines to take away our jobs, livelihoods, and vocations? What will be humanity’s role in such a “brave new world,” where we cannot outperform machines, and why would machines

need us?

## What Should We Do?

As AI advances and becomes more integrated into society, it is extremely important to mitigate negative impacts and prevent misuse. International organizations, governments, companies, policymakers, stakeholders, and individuals must collaborate to establish ethical guidelines, promote accountability and transparency, and foster a culture of critical thinking and responsible AI use.

It is paramount to establish an international committee to create binding regulations on AI development and use. This committee should include specialists from diverse fields, from AI researchers to political scientists to international law experts. Governments must commit to and enforce regulations based on the committee's recommendations, potentially under United Nations auspices.

This committee must address numerous open questions raised by AI technologies. Here are some recommendations:

**Regulations:** Governments and international organizations should establish regulations and ethical guidelines for AI development and use, addressing lethal applications, bias, privacy, security, and transparency.

**Mitigating job market impact:** Recent studies identify legal services, securities, commodities, investments, customer service, telemarketing, and teaching as top industries exposed to AI advancement<sup>22</sup>. To mitigate negative impacts, governments, companies, and educational institutions should launch retraining programs to equip workers with skills needed to work alongside AI and transition to industries with abundant job opportunities.

**Accountability and legal considerations:** Since AI cannot be held responsible for harm, mechanisms must be established to hold organizations and individuals accountable for misuse or deployment. All involved in AI development must abide by regulations preventing misuse.

**Ethical considerations:** AI developers should consider their research's societal implications and prioritize developments aligned with human social benefits.

**Awareness:** The public, policymakers, AI developers, and users must be educated about AI's potential risks and best practices to prevent harmful developments and misuse.

**Watchdogs:** Regulatory bodies should oversee AI development and use to ensure compliance with legal and ethical standards.

**Preventing AI use in weapons:** Tech companies and AI developers should consider potential weaponization of their work and continually communicate findings and concerns to policymakers and regulatory bodies.

**Robust testing:** Training data must be diverse and free from bias and error, ensuring AI does not learn harmful behaviors.

**Preventing over-regulation:** While regulations are necessary, stakeholders including governments, organizations, developers, manufacturers, teachers, and researchers must ensure AI is not over-regulated. Regulations should prevent misuse without hindering peaceful AI advancement.

Overall, preventing AI misuse requires a comprehensive framework of regulations, ethical responsibilities, and technical and social considerations. AI can benefit many aspects of life when used carefully, but we must recognize our responsibilities.

## Summary

AI technology is extremely useful and can bring many benefits to humanity. We ourselves extensively use AI to advance our research. Thus, we are not calling for a complete AI ban, but rather for AI to remain a useful tool. We must create regulations that hinder unethical and harmful applications while preventing AI from becoming superintelligent, overly autonomous, and replacing vast numbers of human workers.

AI offers enormous potential for technological and scientific advancement, but its use comes with responsibilities. It is essential to ensure AI use meets ethical standards and is safe for humans and the environment. Researchers should consider their work's negative societal impacts and prioritize research aligned with ethical standards. Regulations and ethical guidelines should be introduced to prevent AI misuse.

Regulatory bodies should serve as watchdogs, ensuring accountability for tech companies and individuals deploying AI for harmful purposes.

While we call for establishing international regulatory bodies, we recognize that AI's unprecedented development speed may outpace slow international processes. Therefore, we also urge national governments, companies, and individuals to reflect on AI's dangers, form internal ethics committees, and refrain from developing unethical and dangerous technology. Commercial organizations and entrepreneurs may need to voluntarily pause their ambitions and profit motives for humanity's sake. Examples include Italy's recent ChatGPT ban<sup>12</sup> and the open letter calling for a moratorium on developing models more powerful than GPT-4<sup>2</sup>.

## Disclaimer

The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of the authors' affiliated institutions.

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*Note: Figure translations are in progress. See original paper for figures.*

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