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5CS037

Concepts and Technologies of AI

Assignment - II - AI For Social Good

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Abstract

One game-changing technology that has huge potential to solve urgent global issues is artificial intelligence (AI). However, there are serious ethical and environmental issues with its widespread use. The environmental effects of training large AI models are studied in this paper, with a focus on sustainability and energy use. This report highlights the need for energy-efficient solutions and sustainable practices through looking at the carbon footprint of AI development and deployment. In order to guarantee that AI technologies benefit society without threatening the environment, it also addresses ways that reduce these effects. The results are meant to encourage a balance between preservation of the environment and advances in technology.

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Introduction

Ethical AI must address these and other moral questions, such as fairness, accountability, and transparency. The rapid advancement of AI technologies has sparked critical debates about ethical and moral responsibilities, but it has also brought about a new era of innovation. To address these challenges, a number of guidelines and principles have been developed, such as the IEEE Global Initiative on Ethics of Independent and Intelligent Systems and the EU Ethics Guidelines for Trustworthy AI. These frameworks emphasize sustainability, diversity, and respect for human rights as foundational principles, and an ethical AI system must incorporate traits like transparency, accountability, fairness, and energy efficiencyAn ethical AI system should exhibit transparency, fairness, privacy preservation, and accountability.

A dedication to these principles through strategies like thorough audits, environmental impact assessments, and interdisciplinary collaboration is necessary to build ethical AI. The wider societal implications of AI models must be taken into account by developers in addition to their technical performance. Promoting ethical and sustainable AI development is crucial to maximizing its potential for social good as AI becomes more and more part of decision-making processes.

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Review:

Major Ethical Dilemmas and Moral Questions in AI

Environmental Impact of Training Large AI Models

The development of large-scale models like GPT and BERT, which demand huge computational resources, is a result of AI's rapid expansion. Large amounts of energy are used to train these models, which results in known carbon emissions. For example, over the course of its lifetime, training a single large model can produce as much CO2 as five cars. This brings up moral questions regarding environmental sustainability and AI's effect on the environment.

Frameworks for International Collaboration and Governance

Because AI is a global technology, addressing ethical issues requires international cooperation. Inequalities are made more severe by national differences in technology access and regulations, underscoring the need of unified governance

frameworks. Among the difficulties are balancing conflicting laws, customs of culture, and geopolitical objectives.

One of the suggested remedies is the creation of global organizations to regulate the development and application of AI, similar to the International Atomic Energy Agency and others. In order to ensure that AI technologies are developed and implemented fairly across national boundaries, collaborative efforts may promote shared ethical standards.

AI and Social Inequalities

It is impossible to overlook how AI might worsen social injustices. For example, communities of color may be disproportionately harmed by biased algorithms used in loan approvals or hiring procedures. Inclusion must be given top priority in ethical AI development, guaranteeing that systems are built to advance social justice and fairness.

Using diversity in training datasets, carrying out common bias audits, and including a range of stakeholders in the development and application of AI are some ways to address these problems. In order to hold companies responsible for biases in their AI systems, policymakers must also pass regulations.

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Addressing Global Challenges

Good answers to pressing global issues like poverty, education, and climate change can be found in AI. AI-powered models, for example, may predict natural disasters, maximize energy use, and raise agricultural output. These applications, however, bring up moral questions regarding unintended consequences, the digital divide, and data privacy.Stakeholder involvement, accountability, and transparency are necessary to guarantee that AI advances society. Developers and policymakers

Techniques for Sustainability Researchers and business executives are looking into ways to lessen the energy footprint of AI systems in order to allay these worries. Some strategies are:

Energy-efficient algorithms optimize model architectures to use less computing power while still achieving comparable performance. Promising approaches include knowledge distillation, quantization, and pruning.

Sustainable Data Centers: Data centers can greatly lessen their environmental impact by moving to renewable energy sources and installing energy-efficient cooling systems.

Decentralized AI Systems: By distributing mathematical loads across several devices and locations, federated learning and edge computing lessen dependent on centralized data centers.

Implications for Ethics AI's potential for social good is undermined if its effects on the environment are ignored. Without sustainability measures, widespread AI adoption could worsen climate change and disproportionately impact vulnerable groups.

This brings up important moral problems: How can we make sure AI promotes sustainability over the long run? What part should international organizations and governments play in regulating the amount of energy used in the development of AI?

Conclusion

The urgent need for sustainable practices in AI development is highlighted by the question of ethics raised by the environmental impact of AI training. Big models use a lot of energy and add to global carbon emissions, which endanger the stability of the environment. Even though these models inspire amazing inventions, it's crucial to weigh their advantages against their environmental impact.

A multifaceted strategy is needed to mitigate these issues. To power AI operations, developers and organizations must prioritize energy-efficient algorithms, implement carbon-neutral strategies, and investigate renewable energy sources. In addition, it's critical for developing an accountable culture in the AI sector. Openness in disclosing energy use and emissions will motivate participants to adopt eco-friendly behaviors.

Because these issues are global in scope, international cooperation is essential. Frameworks for unified governance can guarantee that advances in AI benefit people without endangering the health of the planet. Achieving this objective requires establishing uniform standards for the development of sustainable AI and promoting international cooperation.

Beyond environmental concerns, social inequality, privacy issues, and inclusivity must all be addressed in the development of ethical AI. We can build systems that not only innovate but also advance social justice and environmental stewardship by incorporating ethical principles into AI's lifecycle. It is our shared duty as we enter an AI-driven future to make sure that new developments in technology are consistent with the principles of accountability, equity, and sustainability.

In conclusion, if AI is developed and regulated responsibly, it has enormous potential to be a force for social good. AI has the potential to be a key component in creating a more equitable, inclusive, and sustainable world by resolving moral conundrums via collaboration, creativity, and stewardship. It is not only a desirable objective to strike a balance between ethical integrity and technological advancement; doing so is essential to using AI to accomplish long-term social good.


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