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TREO Talk Paper

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Abstract

The escalating climate crisis, evidenced by increasing occurrences of extreme weather events such as heatwaves, hurricanes, fires, and flooding, highlights the urgent need for corrective measures, including technological innovation. Generative artificial intelligence (GenAI) models, particularly large language models, are at the forefront of this technological frontier. However, these models come with significant environmental costs. The extensive energy and time required to train such models contribute substantially to carbon emissions, exacerbating the very problem they might help solve.

In response to these concerns, developing more energy-efficient GenAI-training hardware and algorithms is important. Recent advancements like those by Nvidia, which aim to accelerate training processes or at least minimize energy consumption, are steps in the right direction. Yet, the potential of GenAI extends beyond mere technological enhancements.

GenAI could be pivotal in identifying and mitigating factors that negatively impact the climate. By analyzing vast datasets to reveal hidden patterns, generating synthetic data, and simulating environmental processes, GenAI can drive the development of innovative solutions. Moreover, it has the capacity to assist in formulating and implementing comprehensive, eco-friendly policies and strategies.

The utility of GenAI also includes raising public awareness about climate change. Through tailored campaigns that generate educational content according to cultural contexts and norms, GenAI can influence public perception and behavior toward more sustainable practices.

However, the path forward is not devoid of challenges. Issues such as electronic waste and the need for environmentally sensitive responses remain significant. It is imperative to address these through dedicated academic and industrial efforts. Therefore, it is important to establish dedicated tracks within prominent conferences to critically address the intersections of AI, GenAI, and environmental sustainability.

Ultimately, a globally-endorsed strategy is essential. This strategy should mitigate the negative impacts of GenAI technologies while capitalizing on their strengths to combat climate-related challenges effectively. Through such a balanced and proactive approach, we can leverage GenAI not only as a technological tool but as a transformative force for global environmental sustainability.

References

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[*] As stated in the initial submission, all the ideas and the initial draft were my own. ChatGPT was then used to improve the writeup.