Letter to Editor

# Harnessing the Tide of Innovation: The Dual Faces of Generative AI in Applied Sciences; Letter to Editor

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## 1. DEAR EDITOR,

Advancements in Artificial Intelligence (AI) and emerging generative capabilities added paradoxical aspects. One aspect is its positive impact and limitless power it brings to users. On the other hand, concerns about the misuse of this powerful tool have consistently increased [1]. AI advancements affect all domains and sectors as they evolve in their applicable nature in the applied sciences. The more powerful AI the more influence it has on the model workflow within the specific domain and its applied field [2]. This dual nature of generative AI ignited a wide discussion on implementation and produced a debate according to the latest employed tools and technologies by scientists and researchers.

## 1. OPPORTUNITIES

Benefiting from the generative AI in various domains promotes prosperous opportunities in applied data science. Healthcare advanced enormously by utilizing AI tools. 3D organ simulations generated by AI help surgeons and decision-makers [3]. Predicting patients' outcomes and follow-up treatment besides providing real-time assistance decisions. Employing Large Language Models (LLMs) to provide answers for specific cases for patients revolutionized the healthcare sector [4] [5]. The remarkable transformation of modern industry is brought by the creativity of generative AI in multiple aspects. The music industry, visual effects, and filmmaking are greatly impacted by the realm of generative AI. Creativity explored via generative AI added more value and better outcomes for the industry [6][7]. For applied data science, especially algorithms improvement and enhancement where optimization techniques are usually endorsed AI promotes creative steps to overcome local minima and global minima issues [8]. Education associations with AI developed beyond personalized learning. Besides providing an interactive teaching environment, it introduced sophisticated subjects to uncomplicated concepts. Making students more engaged with the education process and information flaws more easily and understandable [9]. Construction and civil engineering scientists employed AI in various stages of their projects, utilizing the accuracy, classification, and prediction merits of the applied target [10].

## 2. CHALLENGES

Ethical considerations raised with the advent of generative AI. Deepfake technology represents a significant moral challenge. Forgeries and impersonating individuals are serious threats to security and individuals' privacy. Misuse of deepfake technology and the spread of misinformation generated through it underscores the concerns to provide measures and regulations [11]. Bias problems expanded the generative AI challenges. Automated recruiting and job application filtering systems could hold potential bias [12]. Credit scoring algorithms might encompass racial or gender biases. The existing problem of bias could be hard to address if the model is trained on a biased dataset [13]. Job availability and economic impact pose another challenge. Despite generative AI's promising potential, multiple sectors in the workforce have job displacement. This challenge of vacancy availability raises concerns regarding the future of several job markets [14]. Privacy concerns the usage of generative AI. Models' requirement for vast training data poses privacy concerns as well as security breach challenges. Ethical handling of the data especially in certain areas like patients, or military data

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poses a big challenge to attaining private and secure employment during training [15]. Plagiarism, content creation, and intellectual property elevate another challenge. Certainly in academia and writing content, using generative AI, with all the advancements imposes critical challenges for the academic community and individual performance evaluations [16].

## 3. CONCLUSION

The new world with employs generative AI is paradoxical. Holding both promising potentials as well as pitfalls with malicious usage. To overcome the addressed challenges and encompass the aforementioned opportunities a collaboration is required. Scientists, policymakers, and regulators need to settle the extent of generative AI for a better new world. Balancing between the powerful impact of generative AI and the addressed challenges is essential especially in creating and developing a counterpart tools and applications for the raised challenges. Researching for this direction which align with the journal scope will hold a significant harnessing to misuse and resolve challenges. This will lead to more adoption of the beneficial generative AI and harness the misuse of it for a better society.

**Conflicts of Interest**

The author declares no conflicts of interest.

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