
Ethical Concerns In Generative AI

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Abstract

Human civilization started due to the need for their necessity. This necessity made humans do impossible into glorious history taking them far beyond space to the moon. Generative Artificial Intelligence is an invention of this modern era. Endless need has met endless possibilities. But as per history, every invention has some major and minor ethical concerns. Generative AI fueled by ML and statistical data has made complex computation, Big project data analysis, and creative design can be completed in just the blink of an eye. However, there are certain major ethical concerns raised throughout the implications and predictions by various scholars and computing stakeholders. So, the purpose of our work is to deep dive into the ethical concerns with a proper neutral review focusing on the well-being of stakeholders. This report provides a transparent need for proper data collection and mitigation strategies on a holistic approach. So by keeping in mind the concerns about the user's privacy, deepfake concerns, societal inequalities, AI biases, job market displacement, accountability gaps, etc., we have gone through a holistic approach. We hope to mitigate all major concerns with full proof of future goals. We are optimistic that this paper will provide future insights into Generative AI content and its mitigation of major concerns by keeping ethical consideration and overall performance.

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Chapter 1

Introduction

In recent years, Artificial Intelligence has grown rapidly, mainly generative AI. Using specific prompts (text-based) one can generate audio, video music, etc. These AI technologies are created using deep learning algorithms, neural networks, and machine learning. These technologies can simulate creativity like a normal human being. And generated content is mostly realistic. Though these AI technologies are exciting they can be harmful. And also can be used unethically. For this, we need to examine critically the ethical implications inherent in the development of generative AI technology.

1.1 Project Overview

Generative AI, a subset of unnatural experiences, has grown to a certain quality of its surprising capacity to make sense unassisted over various mediums, counting content, pictures, and music. This incident is dedicated to a total investigation of moral thinking enclosing the multiplication of generative AI frameworks. Our fundamental goal is to look at the multifaceted impacts of these innovations on society, people, and businesses, linking with the moral situations they incite. We try to enhance the progress of the talk on AI morals through a thorough survey of existing writing, combined with detailed crevice examination and dispersal of comprehensive discoveries. By researching the geographical ethics of generative AI, we do some little experiences that explain current challenges and plan for future investigative directions and display purposes. This information is crucial for breaking down the moral complexity blessed with the development of generative AI, with the ultimate goal being the development of moral decision-making and the direction of moral advancement in AI.

1.2 Motivation

Generative Artificial Intelligence is increasing rapidly and its implications are beyond technological facts. As generative AI systems advance, they pose significant ethical challenges because they generate highly realistic but fabricated content for which it is difficult to

differentiate between truth and false. For example for journalism generative AI can gain trust with misinformation. Also, Generative AI potentially can raise societal biases and concerns about fairness and equity. Particularly it poses a threat to healthcare and criminal justice and many more problems. The motivation of this report is to raise these concerns to help everyone understand the ethical challenges of generative AI. It is to inform all kinds of people to understand both the risks and good things about generative AI technologies. And also to all the researchers, policymakers, and engineers to create, and develop these technologies by making sure they follow ethical guidelines and respect people's privacy and values.

1.3 Objectives

Exploring deeply into the ethical problems brought about by generative artificial intelligence (AI), such as questions on intellectual property privileges, cultural thieving, and the chance for malevolent usage, for the purpose of formulating preventive tactics and rules that back up answerability, openness, and equality in the advance, implementation, and administration of generative AI structures, thereby nurturing faith among those involved and guaranteeing that the advantages of this technology are obtained ethically and responsibly. Besides, To ensure mass people about Generative AI's potential threat. Mitigate possible threats by articulating and encouraging all computing stakeholders about the moral and necessity of following ethics. Encouraging engineers, and developers to practice diversified data and more human interaction with models to end data bias and discriminate data generation permanently over the future. To create a sustainable system for maintaining healthy Generative AI technology for us and our future generation.

1.4 Project Outcome

Generative AI, capable of generating content independently, has made great strides. However, as we are well aware, with power comes responsibility. This report will look at several ethical issues underpinning Generative AI's potential to alter society, individuals, and industries. First and foremost, this project seeks to provide a comprehensive overview of the numerous ethical problems underlying generative AI. To achieve this, In this report we will compile and analyze the data, opinions, and objectives of a range of studies, obtaining a comprehensive overview of the considerable challenge definitions in this setting. Furthermore, this report seeks to help direct the emerging discussion by identifying the need for additional contexts. We hope this project will help people understand the importance of following ethics for the country, society, and the masses.

Chapter 2

Literature Review

2.1 Regulating Generative AI: Ethical Considerations and Explainability Benchmarks[1]

Generative AI technologies are growing rapidly. Research in this technology introduced a variety of models such as GANs, VAEs, etc.[5] These LLM models have applications in many fields.[6] This technology's rapid advancement has raised significant ethical concerns for example data privacy, potential for bias, deceptive content, and deepfake these concerns need urgent ethical guidelines and regulatory measures to tackle. Additionally, Generative AI needs explainability to ensure trust, fairness, and accountability. These systems should work transparently so that people can understand their decisions.

To ensure the responsibility of generative AI technologies and to mitigate the concerns of generative AI technologies, there should be comprehensive laws and guidelines to govern. Currently, global efforts are increasing to establish ethical standards and ensure accountability in AI development and deployment. There are gaps and challenges in AI regulation. These are a lack of harmonization, rapid technological advancement, vague definitions, and limited focus on explainability, etc.

To ensure AI systems are transparent and end-users can understand their decision there must be explainability benchmarks. Such benchmarks exist as Local Interpretable Model-agnostic Explanations(LIME), SHapley Additive exPlanations (SHAP), Anchors, and Counterfactual Explanations. Though these are not enough there are more proposed benchmarks. Key metrics for this benchmark include Transparency, Fidelity, Consistency, Actionability, and Scalability.

In AI regulations, There are some principles for ethical considerations those are transparency about the data the AI model uses, accountability, Fairness, and Non-discrimination, privacy and data protection, safety and security, social and environmental well-being, and human oversight. to embed these principles into regulatory frameworks there few ap-

proaches such as developing comprehensive legislation, international collaboration, stakeholder engagement, adaptive regulatory approaches, promoting ethical AI research and development, establishing oversight mechanisms, and public education and awareness.

Generative AI has both positive impacts and controversial uses. Key positive impacts are in healthcare, environment science, content creation, and education. On the contrary few controversial uses are the creation of deepfakes, producing synthetic identities, autonomous weapon systems, and perpetuated biases.

Researching through Generative AI and within this Research paper there are some key findings. For example, AI is indeed a very powerful technology in this modern world, but it definitely has ethical concerns. These concerns are not easy to mitigate. To problem is innovation and regulation are not easy to balance. If regulations are too much it will handicap the innovation. If regulations are not present then it will definitely be a reason for concern. So the point is, There will be challenges but future researchers must keep in mind the regulations and the ethical concerns and develop these models accordingly.

2.2 The Impact of Generative Content on Individuals Privacy and Ethical Concerns[2]

Generative AI is a product of artificial intelligence that has changed the range of design by creating text, images, audio, and videos by itself. This technology understands from the provided datasets and it has made great improvements, like ChatGPT and Stable Diffusion. It also affects different types of industries and societal environments. It has very big advantages but it also has some serious ethical problems. The introduction section is all about generative AI's creative potential, but it also highlights the need to address its ethical senses. Nowadays, generative AI has become universal, and problems occur with personal results, misinformation, privacy violations, academic property conflicts, and unintended results. A total understanding of and aggressive steps are required to ensure a responsible Artificial Intelligence product. The related work section is all about the real-world cases where the ethical concerns arrises for artificial intelligence. For real-world examples like Zillow's property valuation calculative mistake for the ChatGPT to algorithmic errors etc. These examples highlight the importance of transparency, faults, and ethical concerns in Artificial intelligence applications. There are more examples like the Data management issue occurring in Public Health England's Excel errors which was leading to covid 19 data underreporting. This type of ethical concern should be solved in the near future. The methodology section is all about the understanding of ethical

concern areas of Generative AI. It helps for open communication, educational background, and partner cooperation. With the help of AI, it shows us the structure, the methods of processes, and the tips for better understanding. The AI also developing open inquiry about shared datasets and if it is continuing then its advancement capability will be vast. The Discussion section highlights the importance of cooperation between the technologies, the creators, and the public. Generative AI gives benefits but it also raises privacy and ethical concerns. Modern days personalized content also raises data privacy issues and unauthorised content can harm the public negatively due to misinformation and illegal manipulation. The ongoing discussion is very important for guiding those challenges and making a better future using Artificial intelligence technologies[3].

2.3 The Ethics of Artificial Intelligence in the Era of Generative AI [3]

From 1964 to 1967 a natural language processing computer program was developed which was called ELIZA.[7]until the early twenty-first century there was not any major development but in 2022 the first commercial GenAI system was released called ChatGPT. ChatGPT was developed by OpenAI which is an American research laboratory. ChatGPT is based on generative LLM models.

This paper mainly focuses on two sectors: software engineering both as the source of future generative AI developments and because of the ubiquity of software and cyber-physical systems in modern life, and health and medicine because the practice of medicine has always entailed ethical challenges.[3]

Revolution in computing is not that simple. A Russian mathematician Andrey Markov invented the Markov model. Generative AI uses a Markov chain to generate a sequence of text, data, and images.[8] Deep learning is based on a Neural network which is inspired by the human brain. In 1946, Columbia University offered its students the first for-credit course in computer science. In 1953, the University of Cambridge offered a degree program in computer science. After that in 1962, Purdue University in the United States opens first Computer Science department.[9]

Ethics is mainly a practical discipline that is attached to human action. The purpose of this is to do ethically good. The classical Thomist approach to ethics is applicable here as well. The fundamental three criteria are:

- the ethical object ,
- the intention of the acting subject , and

- the circumstances or concrete conditions surrounding and touching upon the action

Generative AI can be biased in many ways. For example, bias in AI means training that system with biased training data which may lead to discrimination.

Modern AI and ethics are strongly connected. Today's AI is not about programming but it allows the computer to execute tasks and also enables it to learn and adapt. Modern AI follows some steps:

- Step 1: User generates a prompt
- Step 2: Passes to the Large Language Models transformer engine
- Step 3: Engine learning through the model steps
- Step 4: Generate a response
- Step 5: Then pass to the user

The ethics of applied AI is an ethical principle that is a practical implementation of AI. Privacy is one of the most significant concerns because AI systems can contain any sensitive information such as address, name, photo, marital status, salary, etc. Another big concern is "Deepfake". Bad people use deepfake to disinformation, bully or shame, or even more. To prevent this crime many government and private organizations like IEEE, ACM, UNESCO, etc have already been active in this sector. They provide some rules and regulations to prevent crime and make this sector fair for all.

Artificial Intelligence(AI) is growing day by day. Generative AI has many impacts on Software Engineering (SE) and the development of cyber-physical systems (CPS). AI/ML and generative AI offer many benefits such as automatic tasks, increased productivity, improved quality, and increased creativity. The use of LLMs and Generative AI in software engineering and development of CPSs holds ethical concern that needs to be addressed by stakeholders, data scientists, users, society, and many on. Privacy and confidentiality, intellectual property rights, fairness, and trust are some major ethical concerns. The developer should train the AI or ML with proper and legal data. Also, the data should be stored in an ethical, lawful, and transparent way. The output must have been monitored, reviewed, and corrected by human experts. Every University should have a dedicated course for ethics.

Nowadays AI or ML is used in the medical sector for health and better medicine. Medical Students study biology, human cells, hard science, and many more. So, AI is the best option for examining a patient and recording all data on a particular patient for further study. But there are a lot of limitations medical sector for AI such as human intelligence,

physicians, can't to sense fear in a patient, etc. As AI has many limitations in the medical sector sometimes it can misdiagnose, also can increase the risk of harm, as a result, it can be biased in many ways.

From the very beginning, AI challenged us to understand knowledge, creativity, and interaction. But it has some limitations. We can use it for good purposes and can use it in bad ways spreading all sectors of a society from personal life to daily life. So we must follow ethics in generative AI. This paper's main motto was how serious issues arise in software engineering and cyber-physical systems as well as in medicine and healthcare. Shortly AI will play an important role in our lives. So we have to be careful and follow the ethics. We should use every tool to do good things.

2.4 The dark side of generative artificial intelligence: A critical analysis of controversies and risks of ChatGPT[4]

Artificial Intelligence (AI) that generates things has been getting loads of attention lately because it can make text similar to people and chat in natural language. Out of all these things, ChatGPT is a big deal, getting everyone excited about what it can do and worried about bad stuff that might happen. This paper aims to look at current research on the fights and dangers related to ChatGPT, giving some ideas about the right/wrong, community, and money issues connected to this tech. Generative AI is creating more risk factors than expected at first. For its rapid development and limitless possibility a lot of problems and social issues are being expected over the year. For generative capabilities over text, audio, image, and video-based media it is expected to be a necessary evil in the future for its stakeholders.

This paper emphasizes the opportunities and risk factors of Generative AI. For mitigating social factors, and data biases, prompting user data privacy and intellectual rights, and preventing potential geopolitical risks this paper mainly focused on targeting several factors that are clustered from various effects of Generative AI market regulations, poorly controlled data quality, misinformation, DeepFake content, algorithmic bias, spurred job losses, personal privacy and data violations, social surveillance, discriminatory based data generation, socio-economic inequalities e.t.c has been mainly focused on this paper. Here the effects on our daily life Generative AI and ChatGpt have been prioritized.

The literature review section highlights the lack of regulations over Generative AI technology and various factors. The negligence over regulations over the AI market is an alarming factor for all as the lack of regulations can even cause geopolitical risk factors. Improper regulation of AI market can cause an imbalance in the generative AI development over the world. The Countries with higher technological privileges may excel through

AI's advancement and the others may fall behind, which creates an unhealthy situation and concerns about international competition over Generative AI's development. Such unhealthy competition is likely to be seen in unethical practices by data theft, privacy regulations, and so on. Discriminatory generative data are likely to be seen as there is less diversification seen because of imbalance over this technological advancement. Which highly indicates upcoming geopolitical and regional tensions are waiting in the future. As for the algorithmic bias, who should be blamed? a raised question over the time. As for the lack of regulations, it is likely to be seen as a serious problem that is ignored over time. As a result our necessities have always given us solutions to various problems since human civilization it is likely to be seen that we are creating a machine to do Faceless Crimes. As how can legislation punish someone for training an ML model with the dataset? How can someone arrest a Generative AI program with no hands or body? For this regulations are a must to prevent. Mitigating huge factors like DeepFake is a concerned issue over time. Human interaction over data model training set can be a huge factor in combating misinformation, biased data, and privacy-violated generative content.

The conclusion section of this paper highlights the importance of Generative AI and overcoming the risk factors. As it is true Generative AI can cause huge problems like biased data generation, public data privacy violations, leading people to misinformation, and drastic changes in the job market. Every problem can be mitigated by proper regulations and concerned steps by contribution throughout diverse paths.

Chapter 3

Result

Generative artificial intelligence shows results on individual and ethical concerns of critical conclusions. Firstly, The importance of managing ethical concerns in Artificial intelligence development is a growing recognition. Secondly, the stakeholders are impacted across their respective fields due to generative AI and its solution is to cooperate with AI to reduce risk and get maximum benefits from it. Thirdly, Generative AI gives new creations, opportunities, and efficiency but it also affects data privacy concerns, automation spurred job losses, algorithmic discrimination, and societal senses. Lastly, there has to be proper research to overcome those challenges and ensure that Artificial Intelligence is devised and operated responsibly.

3.1 Analysis of Findings

Generative AI has introduced significant models by researchers in this modern time such as Generative Adversarial Networks (GANs), and Variational Autoencoders (VAEs)[5]. LLM technologies have resulted in extraordinary applications for content creation, data synthesis, and more[6]. The use of different models is unique. For instance, some models are efficient whereas some are for their quality. Which indicated that these models have their own strengths and limitations. GANs are known for their high-fidelity image generation, and to do that they require substantial computational resources and can suffer from stability issues. And VAEs are robust and efficient but they may produce less sharp images.

While generative AI is growing rapidly and researchers are making so many models of them because of that the growth has raised significant ethical concerns. These findings of ethical concerns are as follows:

- Data privacy is one of the critical issues, it is mostly caused when personal data is used without users' consent to train these AI models and also it poses the risk of data leak, unauthorized access, and privacy infringement.
- Based on the algorithm and how an AI is trained it can lead to biased results. The

content of these generative AI about sensitive topics such as gender, race, and other demographics can be unfair and unequal sometimes.

- It can create realistic content like deepfake videos by which misinformation created by AI can exploit one. And also by this people can be manipulated and can get scammed. Robust detection of this content is very crucial to combat such things.
- These generative AI models create content automatically and that raises challenges to identify the ownership of the information and the intellectual property. For these legal technology is needed by which we can ensure fair compensation and recognition for creators.
- Generative AI can influence social norms in many ways for example it can impact public opinion and can shape social dynamics. Responsible content creation practice is the only way to prevent such things from happening.
- Generative AI can also harm different kinds of job sectors. The automation industry has met a new limit of production. Now it is being focused on replacing workers with low levels of skill or education. Which will create a huge social inequality in the future.
- The complexity of generative AI systems can lead to unintended results and ethical dilemmas, such as questions of authenticity and the potential to use it maliciously.

[1]

3.2 Stakeholder Impact

Stakeholders are groups of people or individuals, who are directly or indirectly damaged by the development purposes or results of specific technologies or industries. Stakeholders are from various fields of the public including tech creators businesses clients, government, and most importantly educational organizations in the context of generative Artificial intelligence. Every stakeholder has their private interests and ethical concerns about generative AI. The generative AI can produce various content like texts, data, etc that impacts the stakeholders across the society. There are some different types of parties where they are affected like Technology Creators, Business Industries, Clients and Users, and Educational Institutions. Describing those points Below:

- Generative Artificial intelligence proposes some thrilling chances for creators and experimenters for their creation and improvement. But they are also responsible for ethical concern development techniques. It contains transparency, justice, and faults. This problem can be solved by collaboration with policymakers, who can guide ethical difficulties and create faith in Artificial intelligence.

- For the business industries, Generative AI has transformative importance, allowing computerized content, personalized dealing, and improved client experiences. Yet, it is also an ethical concern in business purposes like data privacy, regulatory obedience, and intellectual belongings ownership. This problem also can be solved by enforcing ethical AI approaches that can build consumers' trust and be free with Artificial intelligence technologies.
- Generative AI affects the individuals how they use content online, personalized suggestions, or computerized client services. The AI comforts enhance user experiences, algorithmic discrimination, data privacy concerns, and misinformation. This problem also can be solved by empowering the users to create instructed findings that can mitigate possible harms.
- For the ethical challenges of AI technologies, Educational Institutions can play a crucial role in training the upcoming generations. firstly, if we merge the generative AI ethics in the curriculum then it can empower the students to assess the technologies critically and also can contribute to reliable AI development.

3.3 Comparative Analysis

In this section, we will discuss comparative analysis in Generative AI. We will raise some questions and break them what should we do and what not to do. There are many things to discuss but we will try to cover some which are Bias and fairness, Privacy preservation, Cultural Sensitivity, Environmental Impact, User Empowerment, and Long-term Sustainability.

- Developers should create a system in such a way that it doesn't bias and is fair to all. What can they do to create such a system? They can train their model with big data and valid data.
- Privacy is a must for a user. What will happen if their privacy has been leaked? What can they do to save your privacy? Well, If their privacy faces leak then they will be compromised. To save their privacy user must read the terms and conditions carefully and developers should create a program that won't leak their data.
- Every person should respect all the cultures that exist in this world. We have no right to harm or disrespect another culture. So, developers need to train their programs with various cultures and traditions so that no culture is harmed.
- We should consider the environmental sustainability of every step while creating a system. Also, we have to control energy consumption and carbon footprint in Generative AI. We all users and developers should promote eco-friendly practices.

- Users should have all right to use a program in such a way that they can write, rewrite, modify, and delete something if they wish to do so. Also, they have the full right to hide their identity.
- Developers should always create a program that will sustain a long time. So that user will benefit from using their program and that program can train up with a lot of data. So that the program can give more accurate output.

Chapter 4

Future Work

Some hurried steps without long-term effective measures can not ensure ethics-balanced Generative AI. We need a future-proof solution. Throughout this report, we have observed how dangerous Generative AI could be. To stop it the mitigation strategies can not only be bounded to developers and ML experts. It is a duty for all computing stakeholder to unite and resolve each and every issue with a holistic approach. For this firstly we need better sustainable and actively updated recommendations of policy by experts and users in a diversified viewpoint for a better result on problem mitigation. In the general sense of future direction, Generative Artificial Intelligence has to be directed in such a way it can be used for betterment without affecting the societal structure, user privacy, or cultural or regional discrimination.

4.1 Recommendations of Policy

The complex ethical landscape of Generative AI brings about the necessity of establishing coherent policies that can address the responsible use of the technology and the risks of abuse. Precisely, the following policy recommendations can be deduced from the results of this report which are Transparency, Privacy, Tools, Ethics Education, and International Collaboration.

- It is essential to introduce policies that require developers of Generative AI to give full transparency of their creation. Users must have full rights to know that it is AI-generated.
- Developers should hide user privacy. If they want to use any information, they must ask the user if they can use their data. If the user gives permission, then the developer should use their data. The government should take appropriate action if any developer uses users' data without consent.
- Users should have some limitations in using AI tools. So that they can't commit any crime by using AI. Also if any content is generated by AI then it should show that it's generated by AI

- In this modern world, all people should know the ethics of using the internet also developers should know the ethics mainly in the Generative AI sector. Government and private institutions should arrange public awareness campaigns for the users, developers, and the general public. This will help citizen to make their decisions wisely.
- Generative AI already has an impact all around the world. So, it's necessary to collaborate internationally to exchange information and other rules to respond to new ethical challenges.

4.2 Future Research Directions

The Future direction of Generative Artificial Intelligence requires identifying key fields for additional exploration and creation. The upcoming research areas bound an area of topics and its main Importance is the ethical concerns, boosting societal betterment and increasing transparency of AI technologies. These research areas focus can proceed the development of ethical, responsible, and transparent generative AI and it will benefit society, individuals, and businesses overall. Some key sectors like Ethical Structure, Privacy Protecting Techniques, Algorithmic Transparency, Long-term societal impacts, and Human and AI Cooperation for research in the field of generative artificial intelligence can help to cure ethical concerns. Describing those key sectors below:

- The progress of ethical structure for generative AI can help technology creators, policymakers, and businesses by analyzing data. The problems of discrimination reduction, transparency, accountability, and rightfulness in AI systems should be cured by these structures.
- Privacy protection techniques for generative AI can be explored to help defend individuals' personal data and reduce privacy risks. These techniques can federated learning, differential privacy, and secure multi-party computation to allow collaborative AI model training while defending data privacy.
- The consumers can be interested in exploring ways to better algorithmic transparency in AI systems, allowing them to obtain a deeper understanding of how decisions are made and reducing potential discrimination. There are some methods like understandable AI tools can encourage accountability and trust in AI.
- It is important for aware that human decision-making is the main and these generative AI can be helpful to humans we can not depend on these generative AI tools rather we have to use our own decision-making techniques. Expansive AI acceptance can be pursued for potential societal pursuance through vast studies and scenario-based analyses.

- Generative AI technologies can have their unique ability and useful ways for significant cooperation with humans and processes. Generative AI processes can be made to cooperate with humans through research into human-made design principles, user structures, etc.

4.3 Mitigation Strategies

In this report we have seen the ethical concerns of generative AI, now it is essential to deploy strategies that will mitigate these concerns and also foster responsible innovation. To tackle all these concerns a universal, variational approach is needed to ensure the ethical development of AI technologies.[1]

We have seen that generative AI can be biased in many ways. To mitigate this problem researchers and developers must ensure that the training data is diverse. And also developing a bias detection tool so that it can monitor AI in real time. Privacy is also one of the critical concerns of generative AI, to mitigate this problem, developers should integrate privacy-preserving techniques into generative AI models. And also when using users' data, it should only be used with users' proper consent. To tackle misinformation generated from AI, there must be detection tools so that people can know whether it's AI-generated or human.[1]

There should be a legal framework and responsible content creation to mitigate concerns related to social norms. To get rid of the unintended consequences, Interdisciplinary collaboration is essential.

4.4 Closing Thoughts

By pulling down the curtains here we conclude our report. Throughout this report, we have discovered a technological advancement and its concerns. Generative AI's scope is limitless. This uncontrolled or improperly regulated usage can turn this very magnificent discovery of science into modern madness. We have observed how a major human invention like Generative AI can bring down societal inequalities and affect the working class. How Generative AI and bias algorithms can discrimination and help to spark rumors and societal conflicts and in end affecting human life. How less accountability and improper policy-making can make this modern invention to a faceless criminal which is nothing but a product of stakeholders' negligence. So our vision throughout this report was to reach for the peak of solution on a neutral approach. By any means stakeholders' benefits and safety are prioritized at all concerns. So by analyzing major and minor factors with a holistic mindset about the ethical concerns all the mitigation strategies have been accepted. Through proper regulations and ethically concerned steps by all makers, users, and stakeholders Generative AI can have a sustainable development while mitigating factors and benefiting its users.

References

- [1] Chiu-Ying Luk, Hoi-Lam Chung, Wai-Kuen Yim, and Ching-Wah Leung. Regulating generative ai: Ethical considerations and explainability benchmarks.
- [2] Ajay Sudhir Bale, RB Dhumale, Nimisha Beri, Melanie Lourens, Raj A Varma, Vinod Kumar, Sanjay Sanamdikar, and Mamta B Savadatti. The impact of generative content on individuals privacy and ethical concerns. *International Journal of Intelligent Systems and Applications in Engineering*, 12(1s):697–703, 2024.
- [3] Vassilka D KIROVA, CS Ku, JR Laracy, and TJ Marlowe. The ethics of artificial intelligence in the era of generative ai. *Journal of Systemics, Cybernetics and Informatics*, 21(4):42–50, 2023.
- [4] Krzysztof Wach, Cong Doanh Duong, Joanna Ejdys, Rūta Kazlauskaitė, Pawel Korzynski, Grzegorz Mazurek, Joanna Paliszkiewicz, and Ewa Ziemba. The dark side of generative artificial intelligence: A critical analysis of controversies and risks of chatgpt. *Entrepreneurial Business and Economics Review*, 11(2):7–30, 2023.
- [5] H. Chen Y. Gu R. Zhao Y. He H. Zhou M. Z. Shou W. Wu, Y. Zhao and C. Shen. Datasetdm: Synthesizing data with perception annotations using diffusion models. *Advances in Neural Information Processing Systems*, 36, 2024.
- [6] R. Zimmermann T. Falatouri F. Darbanian and T. Obinwanne M. Nasser, P. Brandtner. Applications of large language models (llms) in business analytics—exemplary use cases in data preparation tasks. *Springer*, 2023.
- [7] ELIZA. Wikipedia (Accessed 11/02/2023). <https://en.wikipedia.org/wiki/ELIZA>, 11/02/2023.
- [8] P.A. Gagniuc. Markov chains: From theory to implementation and experimentation., *Hoboken, NJ: Wiley*,, 2017.
- [9] Purdue University. “computer science pioneer samuel d. Conte Dies at 85, (July 1, 2002).