**Ethical Implications of Deepfake Technology**

Department of Electrical and Computer Engineering, Iowa State University

POL S 534, Legal and Ethical Issues in Cyber Security

Prof. Matt Behrens

May 9, 2024

**Abstract**

The success of deep learning methods in recent years has been staggering. Neural networks, particularly generative adversarial networks (GANs), have demonstrated that they can effectively model the distribution of many real-world datasets. Due to the exploitative, deceptive, and persuasive nature of deepfakes, the implications of the potential spread of such technology are worth exploring. The literature in this work draws out several ethical issues raised by deepfake technology in the context of how it may be inevitably used in specific areas. The potential manipulation of political speech, especially in developing nations or societies with low media literacy, is of genuine concern. Deepfakes could be exploited to create misinformation with minimal effort and cost, which may severely affect election campaigns or even political unrest. Deepfake technology could also be used maliciously in bullying or forms of harassment. The ability to concretely place the face of someone into an explicit video, when combined with the issue of there being little to no legal recourse with regards to taking down such content or punishing the perpetrator, could have severe consequences for the psychological well-being of the individuals affected by such attacks. More frightening still, phishing attacks or social engineering exploits involving faked videos of CEOs or other high-ranking officials instructing employees to undertake specific actions could allow for large-scale security breaches or theft. A generated video may be indistinguishable from an actual recording and would be difficult to verify in many cases.

**Introduction**

In today's digital era, deepfake technology presents several ethical challenges by blurring the lines between reality and deception. This article explores the ethical aspects of deepfakes, examining their various applications and societal ramifications. From entertainment to malicious manipulation, deepfakes raise concerns about truth, authenticity, and societal trust. We analyze the existing legal and regulatory frameworks, technological solutions, and the ethical responsibilities of stakeholders. By synthesizing insights from ethics, law, psychology, and computer science, we aim to clarify the intricate interplay between (Phatnani et al., 2013) technological progress and moral responsibility. Our research emphasizes the urgent need for ethical scrutiny and responsible governance of deepfake technology to mitigate its potential harms and uphold societal values. In navigating this ethical minefield, we advocate for a balanced approach that fosters innovation while preserving truth and integrity in our digital discourse.

**Research Question 1:** What are the ethical considerations surrounding developing, distributing, and using deepfake technologies across various domains, including entertainment, journalism, politics, and advertising?

**Research Question 2:** What are the possible enduring societal consequences of unchecked deepfake proliferation, and how can proactive ethical frameworks and interventions mitigate these risks while promoting responsible innovation and technology use?

**Literature Review**

Ethical Implications of Deepfake Technology

Department of Electrical and Computer Engineering, Iowa State University

POL S 534, Legal and Ethical Issues in Cyber Security

Prof. Matt Behrens

February 19, 2024

Abstract

The tremendous advancements in artificial intelligence (AI) and deep learning have resulted in the development of advanced tools for altering multimedia materials, leading to the emergence of deepfakes. Although these technologies have valid uses, they have also been exploited for unethical intentions, including disseminating false information, political manipulation, and harassment. Deepfakes, which are convincingly altered videos, provide substantial ethical, moral, and legal dilemmas. The present research conducts a thorough literature analysis to examine different approaches employed in detecting deepfakes, emphasizing the significance of addressing the ethical ramifications associated with this technology. Given the potential for deepfakes to deceive and manipulate individuals, organizations, and societies, it is imperative to carefully examine the ethical and moral implications of their production and distribution. Furthermore, it is crucial to thoroughly analyze the legal structure concerning deepfakes, encompassing concerns for privacy, intellectual property rights, and defamation, to address and minimize any damage effectively. This study enhances the ongoing discussion on deepfake detection by examining the detection capabilities of various methodologies and technologies. It underscores the significance of ethical issues in creating and implementing deepfake detection tools. It is crucial to confront the ethical, moral, and legal difficulties presented by deepfakes to protect people and the community from the negative impacts of false information and manipulation.

Introduction

The advent of deepfake technology in the quickly changing realm of technology has introduced an entirely new era characterized by blending reality and fiction. Deepfakes, propelled by sophisticated artificial intelligence algorithms, facilitate the production of highly realistic modified content, including videos, audio recordings, and photographs, frequently impossible to differentiate from genuine media. Although technology shows potential for uses like entertainment and artistic expression, its ethical ramifications have generated heated discussions within academic, social, and technological circles.

The capacity to change visual and auditory input with such accuracy can give rise to several ethical considerations, encompassing:

1. Misinformation and Fake News:

A major ethical issue of deepfake technology is its susceptibility to misuse and fraud. Malicious entities can leverage deepfakes, which are highly realistic fabricated videos that are nearly impossible to differentiate from reality, to disseminate false information, manipulate public sentiment, and harm the standing of persons or entities. This prompts essential inquiries regarding the genuineness and reliability of digital media in a time where distinguishing truth from falsehood has become progressively complex.

2. Privacy Violations:

The ethical ramifications of deepfakes encompass matters about consent and privacy. The use of deepfake technology to overlay individuals' facial features onto explicit or compromising material without explicit authorization gives rise to significant apprehensions over consent, self-governance, and the entitlement to claim authority over one's visual representation. The illicit production and distribution of deepfakes can result in substantial psychological and emotional consequences for the subjects portrayed, including damage to their reputation, harassment, and potential extortion.

3. Social and Political Manipulation:

The ethical implications of deepfake technology coincide with broader societal issues, including the degradation of media credibility, the spread of disinformation, and the risk of political manipulation. With the growing complexity and availability of deepfakes, politicians, engineers, and ethicists are tasked with creating frameworks and rules to tackle the ethical challenges presented by this swiftly advancing technology.

4. Manipulation of Reality:

Given the ethical issues involved, it is crucial to thoroughly analyze the consequences of deepfake technology and contemplate the ethical standards that should govern its creation, implementation, and oversight. Through deliberate and conscientious discussions and moral contemplation, we may successfully negotiate the complex ethical challenges posed by deepfakes and work towards utilizing this technology in a responsible manner for the improvement of society.

The basic approach behind deepfakes

a. Origins of the Deepfake Technology:

At the 2016 Conference on Computer Vision and Pattern Recognition, Justus Thies and his colleagues presented a groundbreaking study that established the basis for the current understanding of deepfake technology. This pioneering research introduced a technique that radically transformed the dynamics of video manipulation. Their novel methodology allowed a designated individual, referred to as the 'source,' to exert influence over the facial expressions of another individual, referred to as the 'target,' in a video. The control was attained through an intricate procedure of re-rendering the desired video, resulting in a final product that was remarkably authentic and visually persuasive. In essence, the invention enabled the smooth replacement of facial expressions in videos, paving the way for the following development and ethical implications of deepfake technology.

b. Creation of the term Deepfake:

The phrase "deep fake" originated in the online domain, attributed to a Reddit user entitled 'deepfakes' who drew status in 2017 by overlaying the faces of renowned actresses onto pornographic material. This application highlighted the possible abuse of deepfake technology. The following development of the user-friendly FakeApp in 2018 significantly expanded access, making deepfake capabilities easily accessible to many people.

c. Comparison between Face2Face and Deepfake:

A significant differentiation is drawn between previous technologies, such as Face2Face, which mainly concentrated on modifying facial movements, and the subsequent deep fakes, which specifically targeted the manipulation of facial texture while maintaining the original expressions. Both methods required the initial recognition of facial characteristics.

d. Early Architecture and Technique:

Early deepfake projects were influenced by two fundamental frameworks: Generative Adversarial Networks (GANs) and Autoencoders (AEs). GANs involve utilizing two neural networks, namely the generator and discriminator, which are competitively placed against each other. The generator uses the acquired information of the neural network to generate an original image as its output. The discriminator is responsible for distinguishing between legitimate and false images.

Both components maintain a continuous interaction. The generator can generate images that trick the discriminator into classifying them as authentic. The discriminator, conversely, gains the ability to avoid being deceived. The higher the discriminative ability, the more challenging it becomes for the generator to provide authentic images, resulting in a more effective performance. Autoencoders (AEs), on the other hand, utilize an encoder to compress images into concise vectors and a decoder to restore the initial material. Nevertheless, these preliminary endeavors were characterized by a high level of computing complexity and posed difficulties regarding reproducibility.

e. Evolution of Deepfake Technology:

The text also describes the development of deepfake technology, with recent scholarly contributions suggesting a shift towards greater efficiency in terms of data and computing needs. As evidenced by their research, Zakharov and his colleagues extended the capabilities of Generative Adversarial Networks (GANs) and Autoencoders (AEs). They showcased their ability to regenerate static images and convincingly modify their appearance. Significantly, these technologies expanded to include speech modulation and visual manipulation.

f. Synergy between Academic Research and Mass Market Adoption:

Notably, the sentence emphasizes the interactive relationship between scholarly research and the extensive utilization of GANs technology in the mainstream market. It highlights the shift from complex and resource-demanding procedures to more efficient and user-friendly methods. This evolution establishes the foundation for further investigation into the ethical problems and regulatory obstacles linked to the increasing prevalence of deepfake technology.

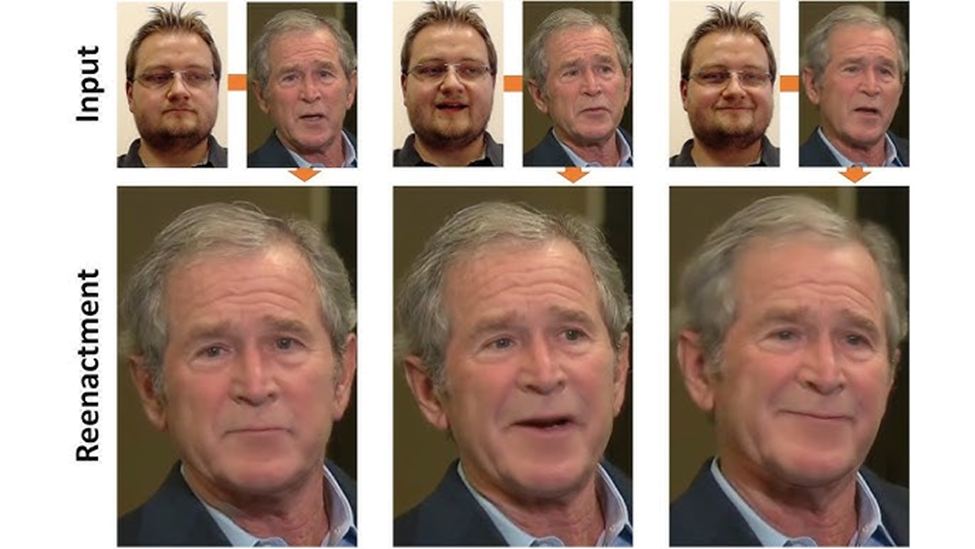


Figure 1. Illustration of Face2Face method

Unmasking Deception: A Comprehensive Analysis of Deepfake Incidents and Their Societal Implications

Case 1: Deep fake in Political Campaigns:

i. Misleading Political Speeches:

Overview: Deepfake technology facilitates the production of genuine videos that can alter individuals' facial expressions and speech.

Impact: Political figures can be depicted delivering speeches or statements that they never actually made, which can impact public opinion and undermine the genuineness of political discussions.

ii. Fabrication of Compromising Scenarios:

Overview: Deepfakes have the potential to generate manipulated information that portrays political candidates engaged in compromising or inappropriate scenarios.

Impact: Regardless of its fictional nature, such content has the potential to harm a candidate's reputation and trustworthiness, resulting in public suspicion.

iii. Voice Cloning for Audio Manipulation:

Overview: Deepfake technology encompasses voice cloning, enabling a recreation of a candidate's voice to generate appealing audio communications.

Impact: This type of manipulation challenges voters to discern accurate and manipulative information, which could impact their decision-making process.

iv. Spread of Misinformation:

Overview: Deepfakes enhance the spreading of false information by generating highly authentic but entirely created content.

Impact: The spreading of false narratives, speeches, or statements during political campaigns can sway public opinion, resulting in the spread of misinformation and the manipulation of voters.

v. Erosion of Trust:

Overview: The widespread existence of deepfake content in political campaigns could lead to a more extensive breakdown of confidence in political communication.

Impact: With the rise of deepfakes, the distinction between reality and manipulation is becoming less clear, making people more doubtful about the genuineness of media information concerning political personalities.

vi. Cybersecurity Threats:

Overview: Using deepfakes in political campaigns presents cybersecurity risks since carefully transmitted material might lead to disbelief and potentially jeopardize the security of a nation.

Impact: Deepfakes can be utilized as components of broader cyber-espionage strategies or disinformation operations, posing supplementary obstacles to safeguarding the integrity of democratic processes.

vii. Policy and Regulatory Responses:

Overview: Authorities and regulatory entities need help to develop policies and regulations to effectively deal with the threats posed by deepfake technology in political settings.

Impact: The discussions mostly revolve around the integrity of content, the accountability of online platforms, and the potential legal ramifications associated with the production and distribution of deepfakes within the political sphere.

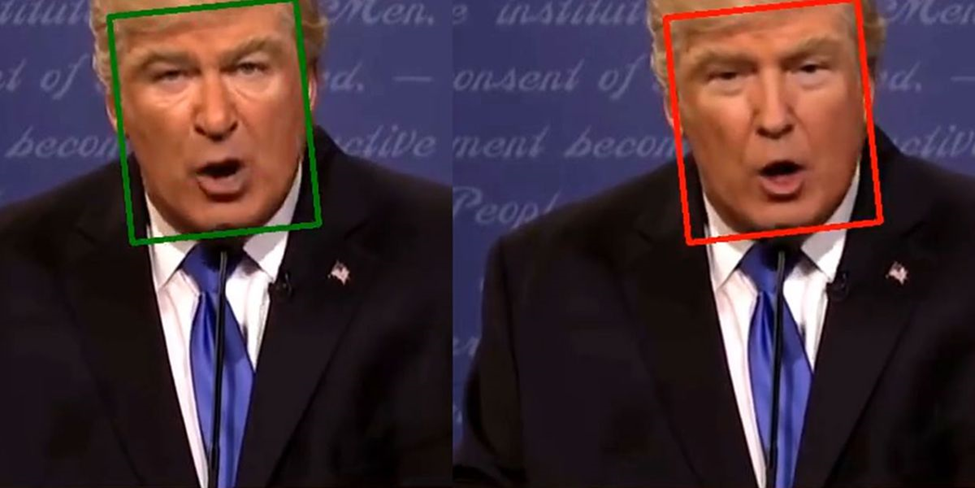


Figure 2. Deepfake in Political Campaigns.

Instance:

The advent of deepfake technology presents a significant and complex problem in current communication. The decisive moment unfolded when BuzzFeed released a deepfake video showcasing former US President Obama, illustrating the simplicity with which manipulated content may be generated. This technology has extensive ramifications, including the potential to harm individuals' reputations, disseminate misinformation, and influence political processes. From an individual's perspective, the risk resides in forming a parallel existence, wherein public people can be manipulated to say or perform actions they never actually did, damaging the ancient concept that 'seeing is believing.'

The reaction to deepfakes is complex, as possible legal and regulatory actions are subjected to constitutional examination. In the current political landscape, characterized by no regard for truth, the need for efficient communication takes priority above moral or factual aspects. From an individual's standpoint, it is challenging to quantify the influence of deepfakes, as their dissemination on social media may surpass that of traditional political campaigns. This gives rise to concerns over manipulating public perception at a time when distinguishing truth from lie becomes progressively more difficult. The academic discussion on the ethical considerations of deepfake technology emphasizes the need for a sophisticated comprehension of its consequences. It urges researchers to investigate and develop practical solutions and regulatory structures to navigate this ever-changing domain responsibly.

Review:

When considering the influence of deepfake technology on political campaigns, focusing on the individual's perspective emphasizes the potential for empowerment and the ability to adapt and recover. Instead of passively receiving information, individuals can actively enhance their media literacy and digital skills. Education activities and awareness campaigns enable citizens to differentiate between genuine information and misleading stuff. Technological methods for verification and fact-checking are becoming increasingly important in this situation, as they allow individuals to verify the authenticity of media information independently. By adopting and utilizing such tools, individuals enhance their ability to critically evaluate information, contributing to a more informed and discriminating electorate. Furthermore, it is essential to cultivate emotional resilience, which necessitates a change in thinking that enables individuals to approach political material with reasonable doubt. This perspective emphasizes the proactive role that individuals can have in their intake of media. A comprehensive approach to addressing the issues posed by deepfake technology involves integrating education, technological involvement, and emotional resilience. By adopting these strategies, individuals protect themselves from the effects of deepfakes but also actively contribute to advancing a better-informed, discriminating, and empowered voting population.

Case 2: Commercial uses of Deep fake:

Deepfake technology has practical uses beyond entertainment and can positively affect several industries. An instance is the utilization of deepfakes by organizations such as CereProc, which exploits this technology to generate voices for persons who have experienced the loss of their loved ones due to diseases. Voice replication technologies, enabled by deepfakes, present a distinctive chance for individuals to participate in virtual dialogues with their deceased relationships or loved ones, offering a means of emotional comfort and connection.

Moreover, the utilization of Generative Adversarial Networks (GAN) technology in video creation holds the capacity to transform the sector. Conventional video production relies on tangible procedures like cameras, studios, and performers, which inevitably limits its ability to be scaled up. Utilizing GAN technologies enables the production of synthetic videos at a reduced expense, resulting in substantial time and resource savings. A concrete instance is the deepfake film featuring David Beckham, which was produced to endorse the Malaria Must Die campaign. Beckham's facial features and vocal expressions were altered to allow him to "speak" in nine other languages, demonstrating the varied and innovative uses of deepfake technology for social purposes.

With the continuous advancement of GAN technologies, the commercial environment is on the verge of a significant transformation, bringing out innovative business models and unique modes of communication. There is a possibility that 'deep fake data silos' may be formed on the internet, which would have control over the production and distribution of deepfakes. Although there are ethical benefits to using deepfakes for commercial purposes, these technologies must be utilized within the boundaries of the law.

The paper highlights the importance of gaining agreement from the right holders before developing deepfake content, considering legal constraints. When disputes occur over the rightful ownership of content produced using GAN technology, well-established legal principles, and theories in contract or tort law might be utilized to facilitate a resolution. The current regulations on initial ownership or the work-made-for-hire doctrine can be applied where there is a need for clarification regarding the ownership of newly created content generated using deepfake technology. In general, the practical applications of deepfakes offer potential for beneficial effects on society as long as they comply with legal and ethical guidelines.

Review:

To thoroughly explore the effects of deepfake technology in commercial contexts, it is necessary to analyze various important aspects carefully. It is essential to explore the psychological impact on users when considering the emotional relief that deepfakes may offer in virtual interactions with deceased loved ones. Moreover, the simplicity and cost-efficiency of deepfake-generated content give rise to questions over its influence on the genuineness of artistic expression, leading to contemplation on the changing essence of creativity. An analysis of deepfakes in educational institutions uncovers possible threats to the integrity of information, underscoring the importance of implementing measures that mitigate the spread of false or misleading information. It is crucial to prioritize consumer awareness and consent in commercial deepfake applications to protect ethical considerations and uphold individual agency. Stringent laws are essential to safeguard against unlawful utilization of data to address the privacy problems linked to 'deep false data silos.' Considering more significant cultural and societal consequences is vital, anticipating alterations in values and norms as deepfake technology becomes more common. Ultimately, the potential benefits of enabling persons through digital avatars emphasize the significance of investigating applications that promote inclusiveness and customized online experiences.

Case 3: Creative deep fakes:

Creative deep fakes demonstrate the artistic and innovative utilization of deepfake technology to produce content beyond conventional applications. These creations frequently include manipulating visual and audio elements to generate imaginative and fascinating results.

Artistic Expression: Creative deep fakes empower individuals to express themselves artistically by blending faces, voices, or scenarios in novel and unconventional ways. The artistic expression can include:

• Placing familiar faces in unexpected contexts.

• Reimagining iconic scenes.

• Even generating entirely fictional scenarios.

Scientific Exploration: Beyond artistic endeavors, creative deep fakes have found applications in scientific exploration and experimentation. Researchers and students may use the technology to simulate scenarios, conduct virtual experiments, or explore hypothetical situations in a visually immersive manner.

Educational Purposes: Creative deep fakes can serve educational objectives by offering engaging and interactive learning experiences. Students and educators may use the technology to recreate historical events, simulate scientific experiments, or bring to life theoretical concepts in a more relatable manner.

Political Debates: Some deep fakes are created to engage in political debates or commentaries. They can be employed to visualize hypothetical scenarios, portray alternative political narratives, or satirize political figures. This application raises questions about the ethical use of deep fakes in influencing public opinion.

Instance:

Face-swapping technology, particularly deep fakes, is no longer primarily linked to sexual content. The online community has channeled its creative abilities by incorporating Nicolas Cage's face into famous moments from well-known movies. This movement emphasizes the wider range of uses of deep fakes, including artistic expression and scientific research, especially in educational environments.

Although deep fakes might stimulate creativity and free speech, they can pose concerns, such as the risk of bullying, especially among schoolchildren. The evolving technology's impact on social dynamics and ethical considerations is concerning.

Legally, deep fakes pose a complex situation. In addition to privacy issues, they involve essential legal principles like contract, tort, and property law. Intellectual property concerns, especially in copyright law, are highlighted. Legal conflicts may include:

• Authorship.

• Infringement of third-party rights.

• The interpretation of fair use rules.

Creators may try to claim protection through exemptions such as parody. Still, the legal results depend on elements such as the work's transformative quality, the original content's attributes, the amount used, and the possible effect on the market.

As technology progresses, the legal system must evolve to deal with the complex relationship between creation, expression, and intellectual property rights in deep fakes. This technology's changing nature requires a strategic and adaptable legal approach to address its complex consequences.

Review:

Individuals must acknowledge creative deep fakes' cultural and social impact and understand how they can influence societal standards. It is essential to comprehend the psychological impact on persons exposed to modified content to evaluate the more significant effects on mental health. Increasing user awareness and education can help individuals identify and analyze deep fakes more effectively, thus improving digital literacy. Promoting ethical content development and developing collaborative platforms for responsible use are essential factors to consider. Individuals can also support sensible rules that balance creative freedom and societal protection.

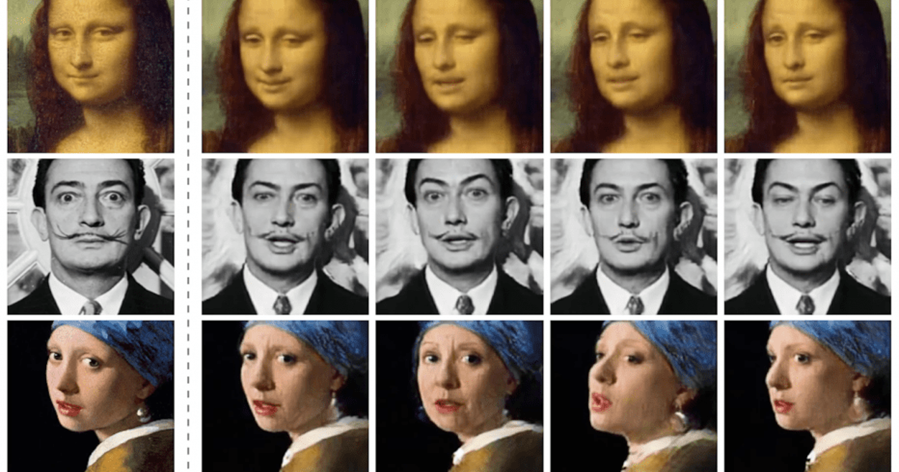


Figure 3. Creative Deep Fakes.

Methodology

i. Ethical Framework Analysis:

An extensive examination of ethical frameworks of deepfake technology highlights the utmost significance of values such as privacy, consent, autonomy, and harm. The issue of privacy becomes obvious when deepfake content is created and shared without permission, as it involves the unlawful use of someone's likeness. This raises concerns about safeguarding personal information and the right to control one's image. Consent, a fundamental ethical principle, is of utmost importance in guaranteeing that individuals are fully informed about and provide their agreement to the utilization of their data for deep fake applications. Autonomy, closely linked to consent, highlights individuals' need to exert authority over their digital portrayals and the narratives generated by deepfake technology. The ethical principle of harm is complex, including the potential damage to individuals' reputations and the wider societal consequences of misinformation and manipulation. Examining these moral concepts within deepfake production highlights the need for explicit laws to protect privacy and autonomy, guarantee informed consent, and reduce potential harm. Ethical considerations should direct the creation of comprehensive regulatory frameworks that govern the responsible utilization of deepfake technology in many areas.

Individual Analysis:

When developing ethical frameworks for deepfake technology, it is essential to consider the psychological effects on persons, mainly focusing on the emotional suffering that can result from digital modifications. Digital identity is necessary for safeguarding one's integrity and values. Furthermore, it is crucial to prioritize the vulnerability of marginalized groups and ensure that ethical considerations consider the unequal impact on specific populations. Advocating for digital literacy and education enables users to navigate deepfake technology responsibly. Legal obligations, community norms, technological accessibility, and cultural sensitivity should be essential for ethical frameworks to offer a thorough and person-centered approach.

ii. Case Study Analysis:

Another intriguing real-life example is the fraudulent imitation of a Chief Executive Officer using deepfake technology. In one case, fraudsters employed deepfake technology to accurately imitate the CEO's speech and behavior, resulting in a successful endeavor to carry out illegal money transfers within the organization. The deepfake was utilized to mislead staff into believing they were adhering to authentic orders from the CEO. This case presents ethical considerations regarding the potential financial detriment of deepfake impersonation and the broader ramifications for business trust and internal security. This highlights the importance of creating ethical rules and adopting strong cybersecurity safeguards to prevent the criminal misuse of deepfake technology for financial fraud and corporate sabotage.

Individual Analysis:

The deceptive replication of a Chief Executive Officer (CEO) through deepfake technology is a striking real-world illustration with substantial ethical ramifications. In this instance, attackers leveraged the capabilities of deepfake technology to accurately imitate the speech and conduct of the CEO, resulting in the successful and unlawful movement of funds throughout the firm. The ethical implications are significant, including the possible financial detriment caused by deepfake impersonation and the more significant effects on business trust and internal security. This incident highlights the critical necessity for ethical protocols and strong cybersecurity safeguards to prevent the malicious misuse of deepfake technology for financial deception and business sabotage. In addition to the immediate economic impact, such occurrences prompt inquiries into the broader cultural and political ramifications of deepfake usage. This underscores the crucial need to tackle these ethical issues to maintain trust in both business and public spheres.

Strengths covered:

1. Comprehensive Analysis: The paper provides a comprehensive analysis of the ethical implications of deepfake technology by categorizing deepfakes into four main categories and examining each category through the lens of legal and ethical considerations.

2. Real-World Examples: The authors discuss real-world examples of deep fakes, such as deep fake pornography and deep fakes in political campaigns, to illustrate the technology's ethical challenges and unintended consequences.

3. Regulatory Perspective: The paper offers a regulatory and legal perspective on deepfake technology, discussing the role of online content dissemination platforms and governments in addressing deepfakes.

4. Ethical Considerations: The authors address ethical aspects of deep fakes, including the initial fear and concerns associated with the technology and the potential beneficial outcomes of reducing transaction costs and facilitating new forms of creativity.

Weaknesses covered:

1. Limited Discussion on Detection Technology: While the paper raises whether deep fake detection technology could help fight socially perilous deep fakes, it does not delve deeply into the effectiveness or challenges of such detection technologies.

2. Lack of In-Depth Regulatory Analysis: While the paper touches on regulatory aspects of deepfake technology, it may need a detailed analysis of existing laws and regulations specific to deepfakes in different jurisdictions, which could provide more insights into the regulatory challenges.

3. Limited Stakeholder Perspectives: The paper may not extensively explore the perspectives of various stakeholders involved in the deepfake ecosystem, such as creators, platforms, and affected individuals, which could offer a more nuanced understanding of the ethical implications.

4. Need for Comparative Analysis: The paper could benefit from a comparative analysis of the ethical implications of deepfake technology with other forms of digital manipulation, providing a broader context for understanding the unique challenges deepfakes pose.

Conclusion

The literature review on the ethical implications of deepfake technology concludes by emphasizing the multifaceted analysis presented in the reviewed works. It acknowledges the structured categorization of deepfakes, real-world examples that illustrate ethical dilemmas, regulatory insights, and a nuanced exploration of ethical considerations. Comprehensive categorization is a valuable framework for understanding the ethical challenges across different deepfake applications. Real-world examples highlight tangible ethical dilemmas, while the regulatory perspective suggests potential measures for mitigation. The review maintains a balanced perspective, recognizing both the potential harm and the creative possibilities of deepfake technology. However, it also highlights potential limitations in categorizations, for example, selectivity and the need for a more comprehensive regulatory exploration. The urgency of addressing deepfake technology's ethical implications is underscored, urging a holistic and informed approach for future research, policy development, and ethical guidelines. Synthesis of perspectives and examples establishes a groundwork for responsibly navigating the evolving landscape of synthetic media. Continuous scholarly engagement is advocated to address emerging ethical challenges in deepfake technology proactively.

References:

Rana, M. S., Nobi, M. N., Murali, B., & Sung, A. H. (2022). Deepfake Detection: A Systematic Literature Review. IEEE Access, 10, 25494–25513. https://doi.org/10.1109/access.2022.3154404

Meškys, E., Liaudanskas, A., Kalpokienė, J., & Jurčys, P. (2020). Regulating deep fakes: legal and ethical considerations. Journal of Intellectual Property Law & Practice, 15(1), 24–31. https://doi.org/10.1093/jiplp/jpz167

Van Der Sloot, B., & Wagensveld, Y. (2022). Deepfakes: regulatory challenges for the synthetic society. Computer Law & Security Review, 46, 105716. https://doi.org/10.1016/j.clsr.2022.105716

Kidd, J., & McAvoy, E. N. (2023). Deep Nostalgia: Remediated memory, algorithmic nostalgia and technological ambivalence. Convergence, 29(3), 620–640. https://doi.org/10.1177/13548565221149839

The new virtuality: a creative website on blurred boundaries between the real and unreal. (2021). The Journal of Media Art Study and Theory. https://doi.org/10.59547/26911566.4.1.06

Wach, K., Duong, C. D., Ejdys, J., Kazlauskaitė, R., Korzyński, P., Mazurek, G., Paliszkiewicz, J., & Ziemba, E. (2023b). 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. https://doi.org/10.15678/eber.2023.110201

Hancock, J. T., & Bailenson, J. N. (2021). The social impact of Deepfakes. Cyberpsychology, Behavior, and Social Networking, 24(3), 149–152. https://doi.org/10.1089/cyber.2021.29208.jth

Passos, L. A., Passos, L. A., Costa, K. a. P., Júnior, L. a. S., Rodrigues, D., Del Ser, J., Camacho, D., & Papa, J. P. (2023). A review of deep learning-based approaches for deepfake content detection. Authorea (Authorea). <https://doi.org/10.22541/au.169735672.27713914/v1>

Dagar, D., & Vishwakarma, D. K. (2022). A literature review and perspectives in deepfakes: generation, detection, and applications. International Journal of Multimedia Information Retrieval, 11(3), 219–289. <https://doi.org/10.1007/s13735-022-00241-w>

Stroebel, L., Llewellyn, M., Hartley, T., Ip, T. S., & Ahmed, M. (2023). A systematic literature review on the effectiveness of deepfake detection techniques. Journal of Cyber Security Technology, 7(2), 83–113. <https://doi.org/10.1080/23742917.2023.2192888>

Wagner, T. L., & Blewer, A. (2019). “The word real is no longer real”: Deepfakes, gender, and the challenges of AI-Altered video. Open Information Science, 3(1), 32–46. <https://doi.org/10.1515/opis-2019-0003>

Tolosana, R., Vera-Rodríguez, R., Fiérrez, J., Morales, A., & Ortega-García, J. (2020). Deepfakes and beyond: A Survey of face manipulation and fake detection. Information Fusion, 64, 131–148. https://doi.org/10.1016/j.inffus.2020.06.014

Korshunov, P., & Marcel, S. (2018). DeepFakes: a New Threat to Face Recognition? Assessment and Detection. arXiv (Cornell University). Korshunov, P., & Marcel, S. (2018). DeepFakes: a New Threat to Face Recognition? Assessment and Detection. arXiv (Cornell University).

Seow, J., Lim, M., Phan, R. C., & Liu, J. K. (2022). A comprehensive overview of Deepfake: Generation, detection, datasets, and opportunities. Neurocomputing, 513, 351–371. <https://doi.org/10.1016/j.neucom.2022.09.135>

Waseem, S., Abu-Bakar, S. a. R., Ahmed, B. A., Omar, Z., Eisa, T. a. E., & Dalam, M. E. E. (2023). DeepFake on Face and Expression Swap: a review. IEEE Access, 11, 117865–117906. https://doi.org/10.1109/access.2023.3324403

**Framework**

Framework for Research Question 1: A sound theoretical and conceptual framework for evaluating the ethical considerations surrounding deepfake technologies could be based on a combination of ethical theories and principles. One such framework could draw from the following theories:

**1. Utilitarianism:** Utilitarianism is a moral theory that emphasizes maximizing happiness or utility. In the context of deepfake technologies, the ethical implications of their use depend on whether the benefits they offer outweigh any potential harm (Diakopoulos & Johnson, 2020). For instance, if deepfake technology enhances the audience's overall enjoyment and experience without causing significant harm in the entertainment industry, it may be considered ethical. However, if deepfakes are employed to deceive, control or influence, or spread false information, the negative consequences may far outweigh any potential benefits. Thus, it is crucial to meticulously consider the ethical implications of using deepfakes and weigh the benefits against the potential harms before implementing them in any context. (De Ruiter, 2021).

**2. Deontology:** Deontological ethics is an ethical framework highlighting the need to adhere to ethical principles and guidelines duties. In this framework, the ethicality of (Zimmermann, 1983) deepfake technologies would be evaluated based on whether they respect fundamental ethical principles, such as autonomy, truthfulness, and justice. Autonomy refers to the right of individuals to make their own decisions and control their own lives. In the context of deepfake technologies, creating videos without the individuals' consent would violate the principle of autonomy, as it takes away their control over their image and reputation. Truthfulness refers to the importance of honesty and accuracy in communication. Deepfake technologies used to spread false information (Buchanan, 2020) or influence public perception would violate the principle of truthfulness. Finally, justice refers to the fair treatment of all individuals and protecting their rights. Deepfake technologies used to harm or discriminate against certain groups of people would violate the principle of justice. In sum, the ethical evaluation of deepfake technologies requires careful consideration of autonomy, truthfulness, and justice.

**3. Virtue Ethics**: Virtue ethics is a moral An ethical framework that centers on the morality of an action or decision representative's character. Developing virtuous traits, such as honesty, integrity, and compassion, is crucial for ethical behavior. When evaluating the ethical implications of deepfake technologies, virtue ethicists would assess whether their development and use promote the cultivation of virtuous character traits or contribute to moral decay. For instance, using deepfakes to spread false information could be seen as a manifestation of dishonesty and a lack of integrity. In such cases, virtue ethicists argue that the ethical implications of deepfake technologies go beyond their technical aspects and impact the character of those who develop and use them.

**4. Social Contract Theory:** Social contract theory is a philosophical concept that (Donaldson & Preston, 1995) posits that ethical principles are rooted in the implicit agreements and mutual understandings that shape social interactions. It suggests that our behavior within society is governed by unwritten rules that we implicitly agree to follow. About the ethicality of deepfake technologies, the question of whether they are ethical or not is a complex one that involves societal norms and expectations. Ethical considerations about deepfakes arise because they have the potential to deceive and manipulate people using manipulated content. Therefore, the ethicality of deepfake technologies hinges on whether their use and development align with the values and beliefs of society. For instance, if society collectively agrees that deepfake technology should only be used with the explicit consent of all parties involved and for legitimate purposes, then using it in a way that violates these norms would be considered unethical. Moreover, the ethicality of deepfakes is not solely dependent on the technology itself but also on the context in which it is used. For example, using deepfakes for entertainment or artistic purposes is more acceptable than using them for political propaganda or to damage someone's reputation. In summary, the ethicality of deepfake technologies is a complex issue that involves societal norms and expectations, the context of their use, and the potential for harm. Therefore, it is essential to consider these factors while assessing the ethical implications of deepfake technologies.

**Framework for Research Question 2**: Certainly! Let us delve deeper into each aspect of the framework:

1. **Erosion of Trust: Deepfakes,** by their very nature, blur the lines between reality and fiction. When individuals can no longer trust the authenticity of the media they consume, it undermines the foundation of trust in society. This erosion of trust can have far-reaching consequences (Robinson, 1996), affecting how people perceive information and interact with each other and institutions. To address this, proactive ethical frameworks can focus on two main aspects:
2. Authentication Mechanisms: Develop robust authentication mechanisms that allow Users to authenticate the legitimacy of media content. This could involve embedding digital signatures or watermarking techniques that provide a verifiable trail of the content's origin and integrity.
3. Digital Literacy Programs: Educate individuals on critically evaluating media content, including deepfakes. Digital literacy programs can teach people to identify signs of manipulation, analyze context, and verify sources before trusting the information.

**2. Manipulation of Public Discourse:** Deepfakes can manipulate public discourse by spreading false information or distorting reality. This manipulation can be exploited for various purposes, including political propaganda, corporate sabotage, or inciting social unrest.

Ethical interventions in this area may involve:

1. Regulations and Standards: Enforce regulations and standards for the responsible creation and dissemination of deepfake technology. This could include guidelines on labeling synthetic media content, disclosing its creation process, and prohibiting its malicious use for misinformation or propaganda.
2. Technological Solutions: Develop advanced AI-driven tools for detecting and countering deepfakes. Collaboration between technology companies, researchers, and policymakers (Etzkowitz & Leydesdorff, 2000) can lead to the development of robust detection algorithms capable of accurately identifying manipulated content.

**3. Privacy Violations:** Deepfakes pose significant risks to personal privacy by enabling the creation of realistic but fake videos or images of individuals without their consent. This can lead to various forms of harm, including harassment, identity theft, or manipulation.

Ethical interventions to mitigate privacy violations may include:

1. Privacy Laws and Regulations: Strengthen existing privacy laws and rules to safeguard individuals from unauthorized utilization of their likeness in deepfake content. This could involve criminalizing the creation or distribution of deepfakes without explicit consent from the individuals portrayed.
2. Consent Frameworks: Develop consent frameworks for creating and disseminating synthetic media involving real individuals. These frameworks should outline clear guidelines for acquiring informed consent and guaranteeing individuals' autonomy over managing their likeness used in deepfake content.

**4. Security Risks:** Deepfakes can pose significant security risks by enabling impersonation in sensitive contexts such as corporate espionage, blackmail, or fraud. This can result in monetary losses and harm to one's reputation or even physical harm to individuals or organizations.

Ethical interventions to address security risks may involve:

1. Cybersecurity Measures: Enhance cybersecurity measures to identify and thwart the harmful utilization of deepfake technology. This could include developing advanced authentication mechanisms, implementing monitoring systems and establishing rules for responding to incidents to minimize the impact of deepfake-related security breaches.
2. Responsible Disclosure Practices: Foster responsible disclosure practices within the cybersecurity community to address vulnerabilities in deepfake detection systems. This involves collaborating with researchers, technology companies, and policymakers to identify and patch security flaws before malicious actors can exploit them.

By implementing these proactive ethical frameworks and interventions, stakeholders can mitigate the risks associated with unchecked deepfake proliferation while promoting responsible innovation and technology use. A multidisciplinary approach necessitates collaboration between different disciplines technology developers, policymakers, civil society organizations, and the public to address synthetic media's complex societal impacts effectively.

**Data**

Deepfake technologies have the potential to cause significant harm in various domains, making it crucial to collect detailed data on the ethical considerations involved. Below is a more detailed breakdown of the data collected in each domain:

1. **Entertainment**: Ethical concerns in entertainment are centered around issues like privacy, consent, and the potential misuse of deepfake technology to create non-consensual (Pataranutaporn et al., 2021) pornographic content or to manipulate celebrities without their permission. Data collection methods include surveys to understand public opinion on deepfake entertainment and its acceptability, investigated interviews with industry professionals to gather their ethical guidelines and analyses of existing legal frameworks for content creation and distribution. These data collection efforts aim to identify potential risk factors and help develop guidelines for the responsible use of deepfake technology in the entertainment industry.
2. **Journalism**: Deepfake technology poses a significant threat to the integrity of journalism, as it can be used to create false information or manipulate visual/audio evidence. Data collection efforts involved looking inti the interviews with journalists and media organizations to assess their understanding of deepfake threats, surveys to evaluate public trust in media amid deepfake concerns, and analysis of emerging best practices for verifying media content in the age of deepfakes. These data collection methods aim to help journalism professionals develop effective strategies to combat deepfake-generated misinformation and maintain public trust in media.
3. **Politics**: Deepfakes can be used to (Verdoliva, 2020) spread misinformation and manipulate public opinion, posing severe threats to democratic processes.

Data collection involved studying the prevalence of deepfake political content online, looking into the interviews with policymakers to assess their understanding of deepfake risks, and analyzing public awareness and perception of deepfake-related political manipulation. These data collection efforts aim to develop effective strategies to combat deepfake-generated misinformation and protect democratic processes from manipulation.

1. **Advertising**: Ethical considerations in advertising relate to consumer deception, brand reputation, and the potential for deepfake ads to exploit vulnerable populations.

Data collection methods include surveys to understand consumer attitudes towards deepfake advertisements, looking into the interviews with advertising professionals to gather industry standards and regulations, and analysis of case studies involving deepfake advertising campaigns. These data collection efforts aim to identify the potential risks and benefits of deepfake technology in advertising and develop guidelines for its ethical use.

Understanding the potential enduring societal consequences of unchecked deepfake proliferation requires collecting data across various dimensions. Here is a breakdown of the data that could be collected, along with how proactive ethical frameworks and interventions can mitigate risks while promoting responsible innovation:

**1. Social Trust and Cohesion:** Data collection involves surveys and studies to gauge public trust in media, institutions, and online information sources in the presence of deepfakes. Proactive interventions include public awareness campaigns to educate individuals on recognizing and verifying deepfake content and initiatives to promote media literacy and critical thinking skills.

**2. Political Stability and Democracy:** Data collection efforts focus on assessing the impact of deepfakes on political discourse (Mubarak et al., 2023), electoral processes, and public trust in democratic institutions. Ethical frameworks may involve the development of regulations and standards for political advertising, as well as the implementation of transparent and secure election technologies to mitigate deepfake-related threats.

**3. Individual Privacy and Consent:** Data could be collected through surveys and interviews to understand public attitudes towards the privacy implications of deepfake technology and concerns related to consent and control over one's digital likeness. Ethical interventions may include legal protections for individuals against non-consensual deepfake manipulation, along with industry guidelines for obtaining explicit consent before using someone's likeness in synthetic media.

**4. Economic and Technological Disruption:** Data collection efforts may involve analyzing the economic impact of deepfake-related disruptions in entertainment, advertising, and cybersecurity industries. Proactive interventions include investment in deepfake detection and verification technologies and industry collaborations to develop standards and protocols for authenticating digital content.

By collecting data across these dimensions and implementing proactive ethical frameworks and interventions, society can better understand and mitigate the risks associated with deepfake proliferation while fostering responsible innovation and technology use. Collaboration between policymakers, technology developers, researchers, and civil society stakeholders is essential to address these complex challenges effectively.

**Methodology**

A multifaceted methodology is proposed to comprehensively address **Research Question 1** regarding the ethical considerations surrounding the development, distribution, and utilization of deepfake technologies across various domains. The study initiated with a rigorous Literature Review, aiming to delve into existing academic literature, industry reports, and relevant publications. This review will focus on deepfake technology and its ethical implications within entertainment, journalism, politics, and advertising. By synthesizing insights from interdisciplinary studies spanning computer science, ethics, media studies, law, and social sciences, the review will provide a foundational understanding of the ethical landscape surrounding deepfakes. Following the literature review, Expert Interviews will be conducted with practitioners and experts from each domain. These interviews will garner firsthand perspectives and experiences concerning the ethical considerations inherent in developing, distributing, and using deepfake technologies. Through probing specific case studies and examples, the interviews will illuminate nuanced ethical dilemmas and decision-making processes within different contexts, enriching the understanding of ethical complexities**.** To complement insights gathered from expert interviews, the study will thoroughly examine Case Studies across entertainment, journalism, politics, and advertising. Real-world instances of deepfake usage will be analyzed to discern motivations**,** impacts, and ethical ramifications within each domain. By identifying common ethical considerations, divergent practices, and lessons learned from these case studies, the study will provide contextually relevant insights into ethical challenges associated with deepfakes. Additionally, Focus Groups comprising stakeholders from each domain will be convened to engage in structured discussions. These discussions will enable participants, including actors, directors, journalists, politicians, advertisers, and consumer advocates, to share their perspectives and concerns regarding deepfake technologies. By facilitating scenario-based discussions, the focus groups will explore the ethical implications of hypothetical deepfake scenarios, fostering a nuanced understanding of domain-specific ethical considerations.

**Research question 2**: A summarized methodology is proposed to comprehensively address the potential enduring societal consequences of unchecked deepfake proliferation and the means to mitigate these risks through proactive ethical frameworks and interventions. The study will commence with a Literature Review encompassing interdisciplinary sources spanning technology, ethics, psychology, sociology, and law. The purpose of this review is to collate existing research on the societal impacts of (Kiesler et al., 1984) deepfake proliferation and the effectiveness of ethical frameworks and interventions in mitigating associated risks.

Following the literature review, Expert Consultations will be conducted with specialists across relevant fields such as technology, ethics, psychology, law enforcement, and policymaking. Through interviews and consultations, insights will be garnered into the potential societal consequences of unchecked deepfake proliferation. Additionally, practical strategies for mitigation will be identified, drawing upon expert knowledge and experience.

The study will analyze Case Studies, examining notable instances of deepfake misuse and their societal impacts. These case studies will provide concrete examples of the potential harms of deepfake proliferation, emphasizing the necessity of proactive ethical frameworks and interventions.

Furthermore, Focus Groups will be convened comprising diverse stakeholders, including policymakers, technology developers, educators, journalists, and members of the public. Structured discussions will be facilitated to explore perceptions of deepfake risks, ethical considerations, and preferences for intervention strategies.

Surveys and Opinion Polls will also be designed to gather quantitative data on public awareness, attitudes, and concerns regarding deepfake proliferation. This data will inform the effectiveness of existing awareness campaigns and ethical guidelines in shaping public perceptions and behaviors. Based on the synthesized evidence from the literature review, expert consultations, case studies, focus groups, and surveys, proactive Ethical Frameworks will be developed. These frameworks will outline guidelines and best practices for responsible innovation and technology use while mitigating deepfake risks. Finally, Policy Recommendations will be proposed to advocate for regulatory measures, education initiatives, and technological solutions at governmental, organizational, and societal levels, thereby fostering a safer and more ethical digital landscape.

**Major Findings**

**Findings for Research question 1:** 1. Deepfake technologies give rise to substantial problems regarding informed consent and privacy rights, especially when individuals' likenesses are utilized without their explicit authorization. Producing and spreading deepfake information without permission can lead to significant breaches of privacy and do damage to individuals' reputations and dignity.

**2. Deception and Distortion**: Deepfakes have the capacity to mislead and manipulate viewers by delivering fabricated or misleading information. Deepfake technology can be utilized in the entertainment business to produce manipulated scenes or performances that distort the intentions or actions of performers. Similarly, in the realms of politics and media, the act of spreading deepfake content has the potential to erode the credibility of public discussions and contribute to the proliferation of false information.

**3. The widespread use of deepfake technologies** has negative effects on society trust and the genuineness of digital material. With the advancing sophistication of deepfakes, there is a rising apprehension that trust in visual media will decline due to their ability to closely resemble authentic material. The erosion of trust can have extensive ramifications in multiple sectors, such as journalism, advertising, and entertainment.

**4. Security and Malicious Use:** Deepfake technologies have the potential to be utilized for nefarious intentions, such as disseminating false information, engaging in fraudulent activities, and carrying out cyber assaults. Political deepfakes have the potential to sway public opinion and erode the legitimacy of public personalities. Furthermore, the utilization of deepfake technology for identity theft presents substantial security hazards, as it enables the impersonation of individuals' identities for unlawful purposes.

**5. Ethical Obligations of Creators and Distributors:** Individuals engaged in the development, distribution, and utilization of deepfake technologies have a moral duty to guarantee that the things they offer are employed in a responsible and ethical manner. This involves evaluating the possible ramifications of deepfake content on individuals, groups, and society. Creators and distributors should adhere to ethical standards such as transparency, responsibility, and the preservation of persons' rights and dignity.

**6. Obstacles related to regulations and laws:** The swift progress of deepfake technology poses difficulties for regulators and politicians in building suitable legislative frameworks to tackle ethical concerns. Striking a balance between safeguarding individual rights and privacy while still upholding freedom of expression and innovation is a multifaceted undertaking that necessitates meticulous examination of ethical, legal, and societal consequences.

To summarize, the ethical considerations related to deepfake technology encompass a wide range of areas, such as entertainment, journalism, politics, and advertising. To tackle these challenges, a comprehensive strategy is (Danelljan et al., 2017) needed that includes obtaining consent based on knowledge, ensuring openness, guaranteeing safety, and establishing responsibility among creators, distributors, regulators, and society. Insufficiently addressing these ethical concerns can have a substantial negative impact on individuals, diminish faith in digital media, and compromise the integrity of public discourse.

**Major Findings for Research question 2:** Erosion of Trust and Truth: Unchecked deepfake proliferation can lead to a widespread erosion of trust in visual media and the concept of truth itself. As deepfakes become more convincing and (Tolosana et al., 2020c) prevalent, distinguishing between authentic and manipulated content becomes increasingly challenging, undermining public trust in digital media. **Political Disruption and Misinformation:** The widespread dissemination of deepfake content has the potential to disrupt political processes and sow misinformation. Fabricated videos featuring public figures Spreading misinformation or participating in improper conduct can manipulate the views of the public, undermine democratic institutions, and exacerbate social divisions.

**Privacy Violations and Consent:** The proliferation of deepfake technologies without proper ethical safeguards can result in widespread privacy violations and breaches of consent. Individuals may be targeted for the creation of non-consensual explicit content, leading to personal and professional harm.

**Media Integrity and Credibility:** Deepfakes significantly threaten the integrity and credibility of journalistic content and media organizations. The manipulation of audiovisual evidence can undermine the reliability of news sources, fueling public skepticism and confusion.

Economic Disruption and Job Displacement: The unchecked proliferation of deepfake technologies can disrupt various industries, including entertainment, advertising, and content creation. Traditional modes of content production may need to be updated, leading to job displacement and economic inequalities.

**Conclusion**

In conclusion, examining deepfake technology's ethical dimensions has uncovered a nuanced landscape fraught with implications for various sectors. In entertainment, the allure of deepfakes for creative expression is tempered by concerns regarding the misuse of likeness and consent, prompting questions about the boundaries of artistic freedom and ethical responsibility. Similarly, in journalism, the potential for deepfake manipulation threatens the integrity of reporting and public trust, raising profound questions about the veracity of information in an already fraught media landscape. The realm of politics is not immune, as the proliferation of deepfakes could disrupt electoral processes, exacerbate societal divisions, and undermine the very foundation of democratic governance. Moreover, the commercial sphere, particularly advertising, faces challenges related to consumer autonomy and the commodification of truth, where deepfakes blur the boundaries separating reality from fiction, raising ethical dilemmas about manipulating consumer perceptions. These concerns are compounded by the enduring societal consequences of unchecked deepfake proliferation, including the erosion of trust, the exacerbation of misinformation, and the (Wu et al., 2016) amplification of social inequalities. However, proactive ethical frameworks andinterventions, encompassing regulatory measures, interdisciplinarycollaborations, and public awareness initiatives, offer a way forward. By prioritizing transparency, accountability, and consent, stakeholders can navigate the ethical complexities of deepfake technology, mitigating risks while fostering responsible innovation that aligns with societal values and promotes the common good.

**References**

Tolosana, R., Romero-Tapiador, S., Vera-Rodríguez, R., González-Sosa, E., & Fiérrez, J. (2022). DeepFakes detection across generations: Analysis of facial regions, fusion, and performance evaluation. Engineering Applications of Artificial Intelligence, 110, 104673. <https://doi.org/10.1016/j.engappai.2022.104673>

Tolosana, R., Vera-Rodríguez, R., Fiérrez, J., Morales, A., & Ortega-García, J. (2020b). Deepfakes and beyond: A Survey of face manipulation and fake detection. Information Fusion, 64, 131–148. <https://doi.org/10.1016/j.inffus.2020.06.014>

Godulla, A., Hoffmann, C., & Seibert, D. (2021). Dealing with deepfakes – an interdisciplinary examination of the state of research and implications for communication studies. Studies in Communication, Media, 10(1), 72–96. <https://doi.org/10.5771/2192-4007-2021-1-72>

Bu, J., Jiang, R., & Zheng, B. (2023). Research on Deepfake Technology and Its Application. APA 7TH EDITION. <https://doi.org/10.1145/3603781.3603790>

Diakopoulos, N., & Johnson, D. G. (2020b). Anticipating and addressing the ethical implications of deepfakes in the context of elections. New Media & Society, 23(7), 2072–2098. <https://doi.org/10.1177/1461444820925811>

Gamage, D., Ghasiya, P., Bonagiri, V. K., Whiting, M. E., & Sasahara, K. (2022). Are Deepfakes concerning? Analyzing conversations of deepfakes on Reddit and exploring societal implications. CHI Conference on Human Factors in Computing Systems. <https://doi.org/10.1145/3491102.3517446>

Chesney, R., & Citron, D. K. (2018). Deep Fakes: a looming challenge for privacy, democracy, and national security. Social Science Research Network. <https://doi.org/10.2139/ssrn.3213954>

Meškys, E., Liaudanskas, A., Kalpokienė, J., & Jurčys, P. (2020c). Regulating deep fakes: legal and ethical considerations. Journal of Intellectual Property Law and Practice, 15(1), 24–31. <https://doi.org/10.1093/jiplp/jpz167>