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Ethics of Deepfakes in Historical Reconstruction for Film and Museums

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ABSTRACT

The emergence of deepfake technology has introduced both transformative opportunities and profound ethical challenges for historical reconstruction in film and museums. Powered primarily by generative adversarial networks (GANs) and related machine-learning techniques, deepfakes enable the creation of highly realistic audiovisual representations of historical figures and events, often indistinguishable from authentic archival footage. While these tools can enhance public engagement, restore fragmented cultural heritage, and expand access to historical narratives, they simultaneously raise concerns regarding authenticity, provenance, consent, and epistemic integrity. This paper examines the ethical implications of deploying deepfakes in historical reconstruction, focusing on tensions between educational value and risks of misinformation, distortion, and manipulation of collective memory. It further explores issues of attribution, transparency, and cultural sensitivity, emphasizing the importance of consent not only from individuals but also from communities whose histories are being reconstructed. The study argues that without robust governance frameworks, deepfakes may undermine trust in historical representation. It concludes that responsible innovation anchored in transparency, accountability, and ethical oversight is essential to ensure that deepfake technologies serve as tools for historical enrichment rather than distortion.

Keywords: Deepfakes; Historical Reconstruction; Ethics; Authenticity; and Museum Studies

INTRODUCTION

Deepfakes constitute a growing threat to historical reconstruction. Video deepfakes are ultra-realistic media produced by deep learning algorithms that can depict individuals saying and doing things they never said or did. Generative Adversarial Networks (GANs), the workhorse of today's deepfake technology, generate videos by mimicking voice, mannerisms, and motion [1]. Furthermore, GANs introduce subtle refinement steps that actively monitor the perceptual and audio quality of the generated videos [2]. These processes produce increasingly sophisticated representations, and their final outputs are often more realistic than traditional digital manipulation techniques such as CGI or Photoshop. Because deepfakes lack the epistemic responsibility of established methods, they raise particular concerns when applied to historical subjects [1]. Deepfakes offer considerable promise for enhancing historical reconstruction. The film and museum sectors increasingly employ technologies such as artificial intelligence (AI), machine learning, and animation to recreate missing or damaged audiovisual material, generating interactive experiences that broaden public engagement with archives [3]. Deepfakes extend this suite of methods by producing reconstructed historical footage in a fully automatic manner. If guided by appropriate ethical frameworks, they could not only remain within historical bounds but also contextualize archives in ways that would otherwise be impractical [2].

The Technology of Deepfakes: Capabilities and Limitations

Creating a deepfake requires manipulating audio and visual content using advanced machine learning techniques to transform a source person's face, an actor, politician, or another celebrity, into someone else's face in a static or moving image [2]. The source person's facial gestures, expressions, and voice can even be reproduced to create an

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authentic-looking video of them saying or doing things they did not say or do. A deepfake may be generated in as little as a few hours with the necessary tools and datasets [3]. Deepfake technologies rely on a number of algorithmic approaches: generative adversarial networks (GANs), face replacement, voice synthesis, and lip syncing [4]. They have a number of limitations, remaining prone to errors that can significantly undermine the historical fidelity of the reconstructed material. A variety of commonly available metrics can be used to evaluate the quality of deepfakes within creative domains, but they operate at a level of abstraction different from the historical qualities under consideration [5]. In addition, widespread incentive structures value speed over quality, compounding the challenge of achieving a faithful historical reconstruction [6].

Historical Reconstruction: Goals, Methods, and Ethical Imperatives

Historical reconstruction in film and museums aims to convey a subject's essence, often from fragmented or imperfect sources. Though various historical reconstruction methods exist, technologies that digitally and perceptually interpolate between available records pose specific ethical questions [7]. Deepfake techniques, which synthesize new audiovisual content from archival materials, have garnered particular attention for their ability to produce material closely resembling original recordings [6]. Deepfakes offer a powerful avenue for historical reconstruction but raise ethical challenges concerning the audience's understanding of the depicted subjects. Works of historical reconstruction aim to represent the significance of a subject for contemporary audiences despite material scarcity. Reconstructions are generally assumed to serve reliable historical inquiry by representing sources faithfully in both digital and physical reconstructions [8]. The accuracy and reliability of reconstructions hinge on epistemic obligations to audiences regarding the fidelity with which sources are respected, create a basis for exploring the interplay between these interests in the historical record and the production of a compelling narrative or experience that connects the past to the present [9]. Provenance refers to the custody history or chain of custody for a given item, providing a record to support authenticity claims. Attribution identifies the creator or originator of an artifact or work that constitutes a basis for academic citations or for securing copyright, patent, or design right protections. Authenticity describes the state of the work and the extent to which it can be regarded as a legally or morally valid representation of the original [10]. Reconstructions nearly always imply an attribution (the original creator is clear to contemporary audiences), while the work itself will be displayed with some provenance (the reconstruction is officially type/series classed) [4].

Beneficence and Harm: Potential Educational Value Versus Risk of Misinformation

Preservation and reconstruction of historic artworks and documents relies on intentionally gathering and organizing original items or high-fidelity replicas into new artefacts capable of enabling alternate perceptions of those parent items [5]. Deepfake technologies can facilitate such reconstruction by travelling beyond retrieval and interpolation toward restoration [6]. When application of masking permits acquisition or synthesis of an entire face, and where original content is available for training, systems capable of generalizing across styles can produce artistic reconstructions of drawings faithful to the content of photographs of the artworks, thereby meeting the competing ethical imperatives for reconstruction [7].

Authenticity, Attribution, and Transparency

Technological advances and the increasing accessibility of machine-learning techniques have spurred widespread interest in historical deepfake applications, immersive digitally altered films, believed to enhance educational value, engagement, and dissemination [6]. Rapid prototyping and democratized software support cultural institutions in producing rich temporal representations of historical figures [7]. However, reduced costs and simplified workflows have prompted uses deviating from established ethical frameworks associated with art and cultural heritage. Attention is needed to balance the potential benefits against harms such as misinformation, erosion of public trust, de-contextualization of artifacts, reinforcement of stereotypes, and erasure of marginal voices [8]. Epistemic duties to audiences, holding the audience in its experiential exploration, while simultaneously maintaining respect for the historically grounded subject, imply a distinction between trace-based reconstruction (re-synthesis via computer-generated substitutes, deep interpolation of photographic sieves, etc.) [9]. Pursuing greater procedural transparency and attentiveness to contextual codes of reception would avoid conflation of documentary realism and interpretive storytelling [7]. The ethical framing embraces certainty and proclaims the intelligibility of the conditions under which an artwork can proceed [8, 9]. Numerous avenues for developing ethical-use policies remain, spanning consent, copyright, custodianship, community engagement, dependability, equitable representation, consultation, and cultural sensitivity [10].

Consent, Rights, and Cultural Sensitivity

When crafting historical reconstructions for film and museums, considerations of consent and rights may not be restricted solely to individuals portrayed but may involve entire communities [6]. Visual reconstruction of historical figures who are deceased raises questions about consent from the deceased and their descendants. Nevertheless the ownership of recorded cultural expressions or physical artifacts may be controlled by an

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institution such as a museum while the associated identity remains owned by individuals or communities. Visual reconstruction of a cultural icon, therefore, requires severe ethical considerations [7]. There exist cases in which a candidate's consent to commit a visual reconstruction process is straightforward; cases may be more complicated when cultural heritage or historical mediocrity are analyzed [8]. Particularly, consideration of the cultural propriety of historical reconstruction allows two approaches: reproduction and strengthening the characteristics of the cultural icon. Reproduction identifies the reconstruction based on an ethnic or cultural background, thereby permitting further consideration for projects involving social representing [9]. Cultural sensitivity ultimately refers to proper course of actions that respect cultural peculiarities, irrespective of general considerations such as cultural reproduction. High cultural sensitivity is expected before the completion of the reconstruction process, allowing risky projects on financially unfeasible reconstructions to be cancelled at preliminary stages [10]. In one reconstruction project it may highly considerate reconstruction due to the entire nation having influence from the cultural icon and leaving enormous cultural footprints; in other reconstruction project long duration of cultural extension underlayed may dominate the consideration. Further consultation on national or societal basis may be possible if the communication shows difficulty [9, 11].

A Framework for Ethical Use in Film and Museums

Historically, museums have reconsolidated items through traditional editing methods such as digital interpolation and restoration based on the general desire to recover the original object while respecting its journey through time [2]. However, the high cost of such a labour-intensive process remains a barrier for many collections; and deepfake technology offers a viable solution [3]. Today, museum reconstructions often strive to portray artefacts while facilitating storytelling by human specialists, who provide guidance to the audience both in-person and via audio guides [4]. In film reconstruction, an equally humanitarian objective entails sharing knowledge and memories. Nonetheless, whether intervening in the creative process to recapture the original intention of an artist rather than viewing the work through a contemporary lens is ethically justifiable, remains a topic of lively discussion [5].

Case Studies in Film and Museum Practice

Deepfake technologies have gained popularity in cinema and galleries to enhance historical reconstructions, presenting new ethical challenges [3]. This section presents illustrative cases illuminating the responsibilities that accompany the deployment, as well as the ethical tensions surrounding the relationship between reconstruction and narrative fidelity [4]. Two situations of film practice may frame the discussion: the reconstruction of historical events through documentary styles, in other words, a close adherence to historical documents and footage to convey the past as accurately as possible and reconstruction through interpretive storytelling, which seeks to imagine a plausible narrative that fills in the gaps between the recorded evidence of events [5]. The first case aims to recover a past more accurately, and so any reconstructions should be open to a rigorous definition of historical fidelity [6]. The second approach conversely raises questions surrounding the transformative limits of technically sophisticated formats that extend mere documentation into imaginative representational frameworks; such "impostures" conventionally raise weaker epistemic objections than those posed to the strictly evidential approach. Yet the extent of free artistic license granted to reconstruction varies widely in practice [7].

Governance, Policy, and Professional Standards

Governance of deepfake technologies must build on existing organizational, regulatory, and professional frameworks for the preservation and use of historical materials, yet it must also consider the specific moral questions raised by these resources and techniques [6]. For instance, the ethical debates surrounding access to and manipulation of historical documents, photographs, film, format, audio, and the like in educational, scholarly, artistic, and commercial projects echo the tensions between reconstruction and digital education identified in earlier sections [7]. Similarly, an overlap exists between established safeguards for new digital media and the concerns related to deepfake technologies [3]. Governance and policy relevant to deepfake technologies can [1] assure access to the extensive and digitized historical media desired by many reconstructive projects; [2] promote stable and widely supported standards for the dissemination, copyright, and provenance of such collections; [3] clarify and assert the professional commitments underpinning the reconstruction of historical media; [4] foster the supportive dialogue and community building, and the consultation and advisory processes essential when deploying deepfake algorithms; and [5] encourage peer review, publicly accessible documentation of methods and datasets, and access to data collection and processing software that would permit independent verification and reproduction of deepfake projects and the historical claims they entail. No single recommendation or body can adequately address all these interlinked demands, but at least three operational principles resonate with the ethical questions invoked by deepfake technologies and usefully inform institutional responses [5]. Existing governance structures relevant to deepfake technologies encompass traditional historical reconstruction practices in film and museums and the enduring moral stakes associated with historical representation and accessibility.

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Responsibilities to uphold broader moral obligations and to observe basic professionalism, craftsmanship, and scholarly integrity also inform these frameworks [6]. These overlapping ethical principles highlight the sensitivity and care with which reconstruction projects and culturally and historically significant audiovisual documents are treated within conventional museum and archival practice [7].

Public Engagement, Trust, and Skepticism

The rise of deepfake technologies has prompted concerns about misrepresentation and authenticity in historical reconstruction efforts. Prioritising engagement and accessibility, these interventions can nevertheless undermine audience trust and devalue original historical materials [10]. Engaging with historical audio and visual documents inevitably raises the questions of veracity of the documents and reconstruction responsibility. The ethics of deepfake reconstruction must therefore address public engagement, trust, and skepticism to provide audiences with a critically informed, contextualised experience [11]. Engaging audiences through familiar, popular, yet dissonant or controversial aesthetics is a common practice in film. Reconstruction practices are therefore confronted with balance between the material integrity of the document and the construction of an immersive historical experience [12]. Relevant measures do seek to promote audience trust in deepfake reconstructions of historical events. Public-facing provenance metadata describing the source, method, and ethical considerations of the reconstruction are one example [10]. The use of trusted third-party educators to frame the historical record provides another measure facilitates audiovisual interpretation of contemporaneous, competing, and sometimes conflicting sources. These measures serve as an important counteract against online misinformation, and thus maximise the audience's capacity to discern [1]. The availability of tools for mass viewing and mass dissemination has made deepfake reconstruction of archival sources widespread [11]. Those reconstructions therefore risk populating collective memory with inaccuracies and exploitations of knowledge, events, and persons. Addressing public engagement, provision of opportunities for deepfake experimentations may encourage explorations of audio-visual representation and reception of previously underrepresented content [1].

Future Directions: Safeguards, Verification, and Responsible Innovation

Deepfake technologies present substantial social and cultural risks that may undermine commemoration and the historical record, and thus require careful consideration that is informed by the ongoing discourse around responsible innovation and risk management without stifling creativity or experimentation [11]. The ongoing introduction of new tools, services, and datasets enables film and museum professionals to explore a growing range of depths, styles, and approaches; these have the potential to reach wider audiences and prompt new kinds of engagements. Consequently, there remains scope to foster further scholarship, create opportunities to collectively engage with these questions, and improve existing technical and institutional architectures [10]. Prioritizing error prevention, identification, and remediation would establish a strong initial research agenda. In particular, recommendations for augmenting existing datasets or training protocols to reduce errors would strengthen the accuracy of the underlying models and lessen the likelihood of misleading results [10]. Such an approach would complement the establishment of error-reporting pathways for existing tools and supporting early detection of misrepresentations in broader public discourse and consequently mitigate the amplification of historical inaccuracies [11]. Additionally, safeguards against model transferability at repository and archival levels would assist in keeping out-of-the-box generators from misusing materials that are intended solely for retained provenance and help responsible experimentation remain responsibly restricted [11].

CONCLUSION

Deepfake technology represents a double-edged development in the field of historical reconstruction within film and museum practice. On one hand, it offers unprecedented possibilities for revitalizing historical narratives, reconstructing lost or damaged audiovisual records, and enhancing public engagement with cultural heritage. On the other hand, it introduces significant ethical risks relating to authenticity, consent, provenance, and the manipulation of historical truth. These risks are particularly acute where reconstructed figures are portrayed without adequate transparency or community consent, thereby blurring the boundary between documentation and fabrication. To address these concerns, ethical frameworks must prioritize transparency in production processes, clear attribution of reconstructed content, and rigorous attention to cultural and historical sensitivity. Governance mechanisms, including peer review, provenance metadata, and institutional oversight, are essential to maintaining public trust and safeguarding historical integrity. Ultimately, the responsible use of deepfake technologies in historical reconstruction depends on balancing innovation with ethical accountability. When properly regulated and transparently applied, deepfakes can function as valuable educational tools rather than sources of distortion, ensuring that historical memory is both engaging and trustworthy.

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