TEACHING DIGITAL IDENTITY: OPPORTUNITIES, CHALLENGES, AND ETHICAL CONSIDERATIONS FOR AVATAR CREATION IN EDUCATIONAL SETTINGS

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ABSTRACT

This article serves intends to serve as a guide aimed at both educators and students, focusing on the rapidly evolving field of avatar creation within creative practices. As tools driven by artificial intelligence (AI) democratise the digital realm, we see a surge in the presence of virtual influencers and V-Tubers who use avatars for a myriad of applications. This unfolding landscape offers significant opportunities for personal and artistic expression but also poses ethical challenges and risks that demand careful consideration. Looking towards opportunities brought by advancements in synthetic media, such as easier access, diversity of representation, collaborative possibilities, and heightened realism in avatar creation. Alongside opportunities, the paper investigates ethical questions related to deepfakes, cultural sensitivities, and the need for stringent data privacy measures. Within the scope of this article, synthetic media is understood as computer-generated content that allows individuals to create and adapt media overcoming specialised skills or training required by earlier generations of media producers. The objective of this article is two-fold: to equip educators and their students with actionable knowledge and best practices, and to guide them in harnessing synthetic media's positive potential responsibly. Through education we aim to foster a digital environment that is safer, more inclusive, and ethically sound for future generations. It also outlines best practices for ethical avatar creation, focusing on transparency, data privacy, diversity, fairness, quality, and responsibility. By adhering to these guidelines, we may navigate complexities of this emerging field while minimising its potential negative impacts on society.

THE NATURE OF AVATARS IN CREATIVE EDUCATION

Figure 1: A scene from Matriculated in the Animatrix by director Peter Chung in which Alexa is jacking into the Matrix

Definition and Relevance: In digital media and virtual contexts Bell proposes the following definition of avatar "An avatar is any digital representation (graphical or textual), beyond a simple label or name, that has agency (an ability to perform actions) and is controlled by a human agent in real time" (Bell, 2008). This presents a valuable tool for creative students, allowing them to construct digital personas that embody their artistic visions.

Figure 2 The Dashvatara: 10 incarnations of Vishnu on earth

https://www.hinduismfacts.org/dashavatara/

Cultural Origins and Ethical Considerations: The etymology of the term "avatar" can be traced back to the Sanskrit word "avatāra," signifying "descent" or "incarnation." Within the Hindu tradition, an avatar personifies a divine entity or deity that manifests itself on Earth by adopting a bodily form, with the express intention of achieving a particular objective or providing guidance and protection to humankind. This etymology provides a cultural backdrop that can inform ethical considerations in creative education. For instance, when students craft avatars, it opens avenues for cultural exploration but also necessitates ethical guidelines to avoid cultural appropriation or stereotypes.

Figure 3 "silhouettes of man through time of the various occupations that he engages in"

Evolutionary Background: Human physiology, an evolutionary response to Earth's environment equipping Homo sapiens with unique traits like bipedalism, opposable thumbs, and advanced cognitive abilities. Foley and Lewin highlight the unique human characteristic of storytelling, and of paleoanthropologists tendency to narritivise the hero myth, drama, and struggle inherent in our evolutionary journey (Foley and Lewin, 2013). Digital avatars allow for an extension of this narrative capability into new forms of representation and self-expression, a possible subplot in our evolutionary story.

Figure 4 "Computer photo of the wedding of Second Life characters Laura Skye and Dave Barmy CREDIT: Photo: SWNS"

Emotional Connections and Guidelines: Discussion of creating avatars is increasingly relevant as people increasingly engage in digital spaces for social interaction, video streaming, and broadcasting. Procter suggests that users develop strong emotional connections with their avatar-personas. "Strong affective links are forged between the user and the avatar-persona due to the former's identification with the latter and because of the affordances of telepresence, co-presence, and social presence as well as self-presence."(Procter, 2021). This emotional bond can significantly enhance the creative learning process but also necessitates guidelines to manage potential emotional risks.

Figure 5 A screenshot from Street Fighter 6's character creator

Ethical and Psychological Challenges: Unlike their human counterparts avatars do not face the same physical laws, interactions or social norms. The avatar's appearance can be as boundless as the creator's imagination, opening up new avenues for personal expression. This liberates creativity but also poses ethical and psychological challenges, such as the potential for self-misrepresentation or the creation of unrealistic or harmful ideals. As educators, it is crucial to address these implications as students explore and develop their digital identities within creative domains.

DELINEATING GAME CHARACTERS AND USER-CREATED AVATARS IN EDUCATIONAL CONTEXTS FOR CREATIVES

In the paper "Characters in Computer Games: Toward Understanding Interpretation and Design" by Petri Lekowski and Inger Ekman, the authors provide definitions that distinguish between characters in games and emerging platforms for avatars as representations of ourselves. According to the paper, predefined functions are created by game developers to ensure players stay within the intended narrative. Conversely, users creating avatars are not limited by these predefined functions and can set their own narrative. (Lankoski et al., 2003)

Non playable characters or (NPC's) are typically designed by developers to fit specific roles or narratives. In contrast, avatars created by people often allow for personal expression, reflecting their personalities, preferences, or desired identities. While avatars created by people are typically used in real-time interactions within digital environments, such as social platforms or virtual worlds, game characters may have scripted behaviors or follow predetermined storylines. Unlike game characters, which usually remain consistent, avatars created by users can be modified over time to reflect changes in personal preferences or appearances. The latter can also serve as powerful tools for developing a user's voice and perspective, educators should seek to divulge to students social and ethical considerations to avoid issues like confining user identities and stereotyping potentially leading to misrepresentation.

NPC's are confined to the game for which they were created, whereas user-created avatars may have the flexibility to migrate across different platforms and digital spaces. For creative students, this portability opens doors to cross-disciplinary experiences and collaborative projects. It also presents challenges, such as the need to manage a consistent digital identity across various platforms, which can be both time-consuming and ethically complex.

REVOLUTIONISING V-TUBERS AND AVATAR INTERACTION: THE EMERGENCE OF INNOVATIVE SYNTHETIC MEDIA APPROACHES

V-Tuber, a nomenclature originating from "virtual" and "YouTuber," referring to a media producer who creates live-streamed video content while embodying a self-selected avatar. The phenomenon of V-Tubers initially garnered prominence in Japan, with content creators adopting visual representations reminiscent of anime-style characters. As the prevalence of V-Tubing has expanded, a substantial number of creators have persisted in embracing anime-inspired personas, while an alternative cohort has elected to adopt anthropomorphic characterisations.

In addition to these traditional V-Tuber categories, there has been an emergence of innovative creators such as CodeMiko, who diverges from the typical anime and anthropomorphic styles. CodeMiko represents a unique V-Tuber archetype, utilising advanced motion capture technologies and interactive environments to create a distinct avatar-persona. This emerging type of V-Tuber blurs the line between virtual and real-world experiences, engaging audiences through real-time interaction and dynamic content.

CODEMIKO: PIONEERING VIRTUAL ENGAGEMENT AND INNOVATION IN THE V-TUBER LANDSCAPE

CodeMiko, a prominent virtual YouTuber (V-Tuber), is the brainchild of Youna Kang, who identifies as "The Operator." This digital persona, referred to as "CodeMiko," is a product of Kang's extensive technical expertise in the media industry. The production of CodeMiko employs an assemblage of prosumer hardware, such as an Xsens motion capture suit for body tracking, optical based face tracking, and software, with a primary focus on Unreal Engine. This convergence of technologies facilitates real-time live-streaming with Kang representing as her alter-ego CodeMiko.

The use of the avatar and virtual environment which forms the majority of CodeMiko's streams has enabled unique approach to audience engagement includes allowing viewers to directly interact with the avatar through triggers, donations via Twitch, or chat inputs, creating a dynamic and immersive experience. (Kang, 2021)
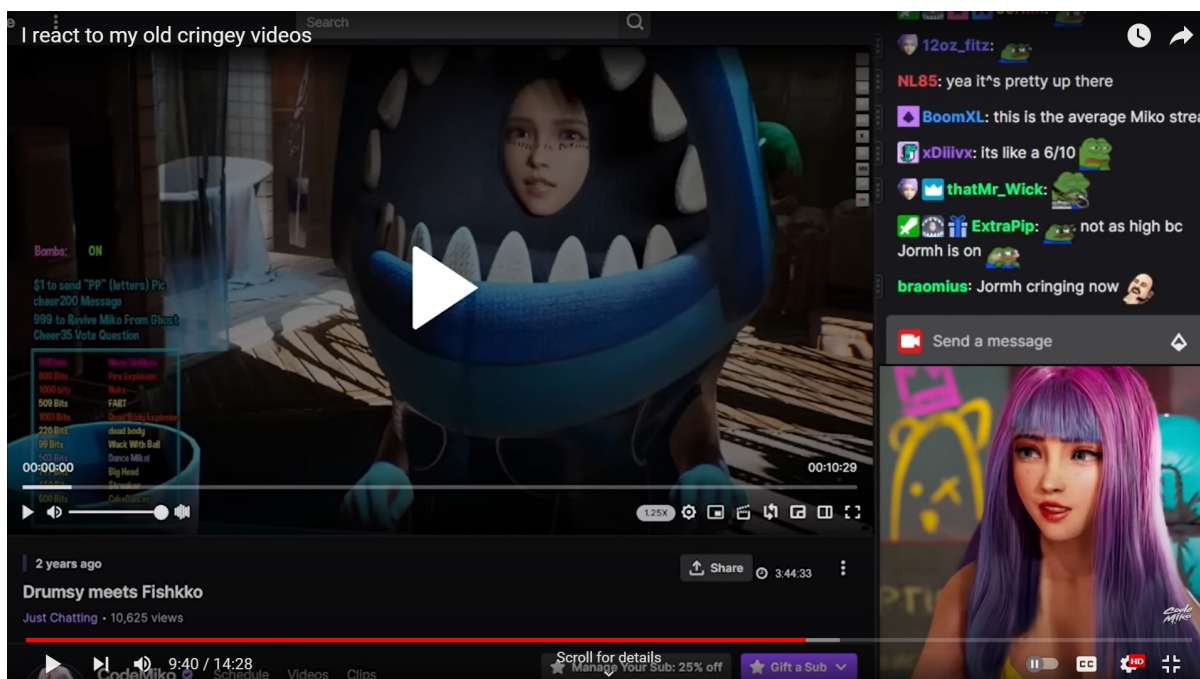

Figure 6 Screenshot from CodeMiko's Youtube channel "I react to my old cringey videos"

The impact of the innovation seen in CodeMiko is discernible in the rising popularity of virtual personas and V-Tubers, as an increasing number of creators investigate the potentialities presented by this medium. The employment of motion capture technology, real-time audience engagement,

and partnerships with fellow content creators has become increasingly pervasive within the V-Tuber community.

Although it may prove challenging to assign specific sources of inspiration to discrete creators, the influence of CodeMiko is manifest in the escalating interest and experimentation with virtual characters in the realms of online streaming and content creation. This tendency is anticipated to persist as the underlying technology becomes more accessible, and content creators' endeavor to distinguish themselves in a progressively competitive market.

Throughout the developmental trajectory of CodeMiko, a series of transformations have transpired, demonstrating a consistent dedication to refining the digital persona's design, technological foundations, and content delivery. This iterative progression has been influenced by factors such as design evolutions, technological advancements, and audience feedback. CodeMiko's visual design has undergone numerous alterations since its initiation. These revisions have aimed to enhance the character's overall aesthetic appeal, refine the granularity of detail, and optimise the design for seamless motion capture performance. Consequently, CodeMiko's current manifestation presents a more polished and visually captivating embodiment of the original concept. It should be noted that changes in an avatars appearance and the Proteus effect can impact the behaviour avatars user or operator and in turn the perceptions of a V-Tuber by their audience (Yee et al., 2009)

Throughout the CodeMiko character's evolution, Youna Kang has successively integrated and adapted to emergent technologies to augment the virtual persona's performance and audience interaction. For example, she transitioned from an elementary motion capture setup to a sophisticated Xsens motion capture suit and incorporated the Unreal Engine for advanced rendering and real-time virtual live-streaming capabilities.

The continual evolution of CodeMiko's character exemplifies the potential for sustained growth and innovation within the domain of virtual influencers and V-Tubers. By remaining receptive to technological advancements and audience input, creators such as Kang can adapt and flourish in a perpetually shifting digital landscape. This adaptability is particularly evident in the evolution of their avatars, which can be continually refined and updated to meet changing needs and expectations.

SYNTHETIC MEDIA: DEMOCRATISING AVATAR CREATION AND SHAPING THE FUTURE OF DIGITAL PERSONAS IN BROADCASTING AND LIVE-STREAMING

The augmented accessibility to create novel representations of individuals in broadcasting and live-streaming environments has been facilitated by the advent of synthetic media. Synthetic media

encompasses digital content generated or modified by artificial intelligence (AI) and machine learning algorithms, including images, video, audio, and text (Millière, 2022). The recent proliferation of readily accessible tools contributes to the democratisation of the technical processes involved in producing high-quality digital media.

In an educational context, the traditional avatar creation process has often posed challenges for both students and teachers due to its steep learning curve, artistic aptitude and reliance on specialised software and hardware. However, AI is currently diminishing these technical barriers to entry, rendering the process more accessible. Analogously to how smartphone camera technology enabled individuals with a vision to capture and edit high-quality photographs, AI now empowers those with creative intent to efficiently produce the foundational components required for generating avatars.

Tools like Unreal Engine's MetaHuman Creator are becoming educational assets. They simplify the avatar-creating process, making it more accessible for students and educators who may not have advanced technical allowing users to create high-fidelity digital humans with ease. The user interface is familiar to any player who has created characters in games, and users can create a MetaHuman in just a few minutes (Unreal Engine MetaHuman Creator, 2023). With further technical skillsets users can then bring Unreals Metahuman's into a variety of digital contexts be it games, animation or virtual production.

Mesh To MetaHuman extends the MetaHuman toolset enabling a 3D scan of a human face to be upscaled within moments to a high fidelity, colourised, rigged and animatable metahuman head. This process alone would have taken potentially weeks of work when using more traditional 3D modelling and animation packages. Human characteristics previously computationally and technically challenging to replicate in real time and with high fidelity can now with machine learning allow for the compression of "simulation data into a format that can be evaluated at runtime" (Engine, 2023)

As game development technologies become increasingly democratised and accessible to media producers and live streamers, including V-Tubers and avatar creators, it prompts inquiries regarding the future manifestations of virtual environments and characters. When individuals can express their creativity unencumbered by constraints typically imposed by games on appearances, physicality, and environments, how will this development influence the evolution of digital personas, such as V-Tubers and avatars, as well as the virtual worlds they inhabit?

Synthetic media emerges as a crucial factor in the creation of avatars for V-Tubers, facilitating innovative approaches to digital persona development and customisation. Synthetic media, which encompasses computer-generated imagery, deep learning algorithms, and artificial intelligence, provides creators with the means to generate unique, realistic, and dynamic avatars with unparalleled flexibility and control.

The incorporation of synthetic media in avatar creation will allow a broader range of artistic expression, as creators can develop digital personas that replicate and even surpass traditional boundaries of appearance, physicality, and environmental constraints. Consequently, creators such as V-Tubers and platforms outside of streaming can construct avatars that more accurately embody their envisioned identity, catering to diverse cultural, aesthetic, and thematic preferences.

Synthetic media permits the implementation of advanced interactivity and personalisation within the V-Tuber domain. Real-time facial and body motion capture, voice synthesis, and responsive environments collectively contributing to a more immersive and engaging experience for both the creator and their audience.

While synthetic media offers exciting educational opportunities, it also brings ethical considerations into the classroom. The blurred lines between reality and virtuality necessitate an educational framework that instils responsible use. This advancement will facilitate the growth of digital personas, such as V-Tubers and avatars, in increasingly diverse and sophisticated ways. Subsequently, this evolution may incite further exploration into the ethical, social, and cultural implications of these virtual characters and the worlds they inhabit, as the differentiation between reality and virtuality becomes progressively indistinct.

ADVANTAGES OF SYNTHETIC MEDIA IN AVATAR CREATION AND COLLABORATION

In the classroom, synthetic media offers several advantages. Beyond simplifying the avatar creation process, it allows for more inclusive representation and encouraging interdisciplinary teamwork among students. Firstly, ease of access is significantly enhanced, as many contemporary tools offer user interfaces that are more comprehensible to a wider audience compared to their predecessors, which often featured complex UIs and associated technical jargon.

Secondly, AI tools facilitate the generation of diverse avatars, allowing users to create digital representations that accurately depict unique characteristics (Chen et al., 2022). This capacity may contribute to more inclusive content, compared to methods that relied on artists' ability to represent cultural diversity, and enable collaborative interdisciplinary production of media.

Through co-creativity and humans working alongside AI (Wingström et al., 2022) collaboration can be amplified when all members of a creative team have the opportunity to explore different aspects of the creative process, even if these activities extend beyond their established training and skillset. For instance, an animator may generate concepts using image generation tools to examine the range of

movements and expressions for an avatar's animation and use these as a communicative tool with the project's concept artist.

Inevitably, the employment of synthetic media tools yields increased time and cost efficiency. AI may also facilitate enhanced realism within avatar creation, particularly when overcoming challenges associated with the uncanny valley effect. As a result, photorealistic output and voice synthesis or modification become simpler to achieve.

Accessibility is another critical consideration when examining synthetic media's impact on avatar creation (Mack et al., 2023). Freedom to innovate and create enabled by synthetic media will allow a wider range of freedom for diverse users to create their avatars. The artificial synthesis of motion capture data and its attribution to avatars allows for the accommodation of users with diverse abilities, enabling their interactions to be more accurately reflected and interpreted in a manner they deem appropriate. This level of customisation has been challenging, if not unattainable, to account for in traditional motion capture methods, avatars models and development processes.

POTENTIAL CONCERNS SURROUNDING SYNTHETIC MEDIA IN AVATAR CREATION AND USAGE

The rise of synthetic media in educational settings brings a unique set of challenges, including the potential misuse of deepfake technologies. Educators need to be aware of these risks and educate students on the ethical considerations. Deepfakes, which can include avatars impersonating others for malicious purposes, have prompted legislative action, such as the Malicious Deep Fake Prohibition Act (Malicious Deep Fake Prohibition Act of 2018, 2018) and the DEEP FAKES Accountability Act (DEEP FAKES Accountability Act, 2021). These acts create new criminal offenses for producing non-compliant deepfakes and for altering deepfakes to remove or obscure required disclosures. Violators may face fines, imprisonment for up to five years, or both. A rapidly emerging range of synthetic media tools seen in software examples such as Synthesia.ai (Synthesia | #1 AI Video Generation Platform, 2023) allow for the easy creation of animated AI avatars as reported in the NY Times ('The People Onscreen Are Fake. The Disinformation Is Real', 2023) Synthesia Co-Founder and chief executive Victor Riparbelli notes Synthesia's Terms of Service states users should not create "political, sexual, personal, criminal and discriminatory content." But Riparbelli also admits as a result of improvements in the underpinning technology "Identifying misinformation will become harder to detect".

An illustrative example of the potential harm arising from the misuse of synthetic media can be seen in example of the proliferation of deepfake pornography (Thomas et al., 2021). This disturbing

trend involves the use of AI to digitally manipulate videos and images, such as removing clothing or replacing faces without the consent of the individuals involved. The resulting content, which can be virtually indistinguishable from real footage, can cause significant harm to an individual's reputation and psychological well-being. As AI tools become increasingly accessible and easy to use, the creation of hyper-realistic deepfakes is within reach of anyone with a smartphone or computer. This raises serious concerns about the potential for widespread misuse of synthetic media, underscoring the urgent need for effective solutions to detect and combat deepfakes. (Gieseke, 2020)

While AI-based detection tools can play a crucial role in identifying deepfakes, they often lag behind the advances in AI models that can continually adapt to bypass these detection mechanisms. This presents a significant challenge in the ongoing battle against deepfake misuse (Hussain et al., 2021). However, embedding deepfake detection capabilities within web-based applications and services, such as social media platforms, could provide a viable temporary solution. By integrating these detection tools directly into the platforms where deepfakes are most likely to be disseminated, it may be possible to deter and dissuade individuals from pursuing creating and sharing deepfakes as these synthetic media tools continue to evolve.

Education initiatives can play a pivotal role in mitigating the misuse of synthetic media. By raising awareness about the potential harm that can result from using deepfakes or impersonating others through avatars in real-time spaces such as games and multi-user environments, individuals may be more likely to think critically about their actions and the potential consequences. Such initiatives could include digital literacy programs that teach users about the ethical implications of synthetic media, as well as strategies for identifying and reporting deepfakes. By fostering a greater understanding of these issues, we may empower individuals to use synthetic media responsibly and contribute to a safer digital landscape.

Ethical concerns arising from synthetic media usage in live streaming, such as issues related to identity, privacy, and misinformation, are important considerations. These concerns encompass deepfake controversies, legal cases, and examples of V-Tuber controversies, as well as deepfake voice cloning, misinformation, or malicious uses. Transparency, proactive detection and disclosure of deepfake content are essential for ensuring responsible usage when moving rapidly towards seeing full-body deep fakes realised with synthetic media. (Lyu, 2020)

Additional concerns include the feasibility of fully customisable media for individual audience members and the appropriate parameters that creators should implement to ensure responsible use of synthetic media (Hayes and Johnson, 2019). Another critical aspect to consider is whether the increased use of synthetic media might erode cultural boundaries, as creators may adopt global aesthetics or

styles, potentially diluting the unique elements of their cultural backgrounds. These concerns highlight the need for a careful examination of the impact of synthetic media on the live streaming environment and its potential implications for content creators and audiences alike.

The rising popularity of V-Tubers (Li, 2023) and synthetic media ('VTubers: The Rise of Synthetic Media in Entertainment', 2023) raises several important questions and concerns. One such area of interest is the potential shift in audience preferences, viewer engagement, and market dynamics due to the growing presence of virtual streamers, which may influence the balance between traditional human live streamers and their virtual counterparts or alter-ego's. As synthetic media becomes more democratised, it raises questions about its inevitable effects on the live streaming landscape, content diversity, and opportunities for new creators.

Data collection and information security are also significant concerns, as demonstrated by incidents involving catfishing, fraud, identity theft, and data breaches. Ensuring data privacy and consent is crucial when dealing with avatars and synthetic media.

As educators and students, the responsible use of avatars extends beyond the classroom. Anonymity can lead to negative behavior such as cyberbullying, harassment, trolling, misinformation, catfishing, and illicit activities. Educational initiatives can provide the ethical framework needed for responsible digital citizenship. While anonymity and avatars can offer benefits, it is crucial to promote responsible behavior and implement measures to mitigate potential negative consequences associated with concealing one's true identity online.

AVATAR CREATION IN EDUCATIONAL CONTEXTS: HARNESSING SYNTHETIC MEDIA'S OPPORTUNITIES AND NAVIGATING ETHICAL COMPLEXITIES

The rise of synthetic media presents transformative possibilities for how individuals represent themselves through avatars, especially in educational settings focused on digital arts and technology.

Synthetic media has the potential to significantly impact how humans represent themselves physically as avatars. Firstly, users may be able to create avatars that more closely resemble their physical appearance, including facial features, body type, clothing, and accessories. This could provide a greater sense of personalisation and immersion in virtual environments. It is foreseeable AI will also lead to new freedom and choice in representations of humans as avatars such as that explored in transhumanist artworks such as that of Universal Everything's Maison Autonome and Transfiguration (2023)

Secondly, synthetic media technology could enhance the realism of avatars, with more lifelike facial expressions, body movements, and interactions with virtual objects and environments. This could further enhance the sense of immersion and presence in virtual environments (Seymour et al., 2020).

Thirdly, users have the potential to broaden their virtual identities through the creation of highly customised avatars that can seamlessly exist across various platforms and environments, paving the way for innovative forms of self-expression and creativity. Notably the concept of homuncular flexibility which entails the capacity for humans to inhabit an expanded or non-human virtual body presenting the opportunity for users to empathise with the character they embody, or to enhance human functionality through the integration of novel features (Won et al., 2015)

However, as educators and creative professionals, we must also address the ethical considerations bound to synthetic media's capabilities. These range from the potential for misrepresentation and identity fraud to the creation of deepfakes that could unduly influence public opinion. It is crucial that curricula incorporate these ethical dimensions, guiding students toward responsible and impactful use of this groundbreaking technology.

In sum, the classroom provides a fertile ground for exploring the potential of synthetic media in avatar creation, but it also necessitates a thoughtful approach to ethical and responsible usage.

CONCLUSION: NAVIGATING ETHICAL AND CREATIVE FRONTIERS IN AVATAR DESIGN EDUCATION

As we look at the transformative impact of synthetic media on the landscape of digital avatars, it becomes evident that this potent tool brings with it an array of ethical and practical considerations. For educators teaching the next generation of creative professionals and for students keen on shaping virtual worlds, the following best practices aim to provide a comprehensive ethical guide.

- In academic settings and professional practices alike, transparency is non-negotiable. Clearly disclosing the use of synthetic media not only fosters trust, credibility and ethical conduct but also prepares students for potential legal and regulatory shifts that may come into play in the future.
- Data privacy should not be considered simply a term but instead a commitment. Obtaining informed consent, adhering to secure data storage practices, and understanding privacy laws are foundational steps for creating an ethical digital art practice. Educators should instill these concepts early to cultivate a culture of responsibility.

- Diversity is also essential when using synthetic media in avatar creation. By creating avatars that represent a broad range of individuals based on ethnicity, gender, age, and physical abilities, content creators can not only enrich their portfolios but also the broader digital eco-system.

- Fairness and equity must be taken into account. It's essential to ensure that students' avatars neither marginalise any groups nor perpetuate damaging stereotypes, herein reinforcing the ethical considerations that are key to any creative endeavor.

- Quality is another important aspect of avatar creation using synthetic media. High-quality avatars do more than just look good; they also minimise the risk of unintended consequences that could be ethically problematic. Quality assurance processes should be built into project timelines, reflecting the importance of this aspect.

- Ultimately, avatar creators bear responsibility for the virtual beings they bring into existence. Students must be taught to consider the ethical ramifications of their creations, from possible impacts on vulnerable populations to the stewardship of inclusive digital communities. Here, the enduring importance of individual anonymity in the ethical use of avatars should be underscored.

By embedding these principles into educational practices, we can equip students to ethically and creatively harness the full potential of synthetic media. This approach not only mitigates risks but also aims to create a digital landscape that is both ethically sound and artistically vibrant in an age of unprecedented technological growth.

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