CineMods: Envisioning a Future of AI-Driven Film Personalization

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***Abstract*—Modding in the gaming industry has significantly expanded the longevity and value of digital games through user-driven creativity and customization. In contrast, the film industry has remained largely linear and non-interactive. With the emergence of generative Artificial Intelligence (AI) technologies, new opportunities arise for dynamic and personalized film experiences. This conceptual paper explores the concept of Cinematic Modifications (*CineMods*), AI-enabled, user- or provider-generated modifications to movies. We draw parallels to game modding culture, examine the technical, ethical, legal, and commercial implications, and propose a framework for user studies to investigate the desirability and potential adoption of this concept.**

***Keywords*-Generative Artificial Intelligence; Film Personalization; Ethics; User Modding.**

I. Introduction

Digital media consumption is increasingly shaped by personalization. While video games have long embraced user-generated modifications, films remain largely fixed in form and narrative. Advances in generative AI may now open cinema to similar transformations. We introduce the concept of *CineMods*, AI-based modifications by users or providers that enable personalized reinterpretations of films. Inspired by game modding culture, *CineMods* allow viewers to alter visual style, tone, or narrative structure without interactivity. A single scene can be reimagined in distinctly different styles using generative AI, revealing the creative and emotional potential of customizable cinematic experiences. This paper outlines the conceptual foundation, technical feasibility, and ethical implications of *CineMods*, and proposes a research agenda to explore their desirability and impact. The anticipated contribution of this work is twofold: first, to establish a conceptual and technical framework for personalized cinematic modifications, and second, to initiate interdisciplinary dialogue around their cultural, ethical, and commercial implications. We expect that CineMods will prompt reconsideration of the role of authorship and participation in future media landscapes. This paper is structured as follows: Section II reviews related work. Section III outlines the CineMods concept and implementation strategies. Section IV describes a planned user study. Section V discusses ethical and legal aspects, and Section VI concludes the paper.

II. Background and Related Work

Game modding communities have long demonstrated the creative and commercial potential of user-generated content [1]. Titles like *Skyrim*, *Minecraft*, and *Half-Life* have fostered vibrant ecosystems in which players expand core experiences by introducing new mechanics, aesthetics, and narratives. Such mods can significantly increase a game's cultural relevance and commercial lifespan, and in some cases have led to independent commercial successes, such as *Counter-Strike*. In film and literature, participatory practices, such as fan fiction, unofficial recuts (for example, the "Topher Grace cut" of *Star Wars*), or independent remasters also reflect a strong desire to reinterpret narrative media. However, these practices typically remain outside formal distribution channels and often lack legal support or technical infrastructure. Interactive experiments like Netflix's *Bandersnatch* have explored branching narratives, though these rely on predefined choices and do not involve generative transformation. Recent advances in generative AI now enable dynamic, personalized media experiences. Tools, such as GPT [3], Stable Diffusion [4], and generative audio models [5][6] support the manipulation of visual, textual, and auditory elements in real time or through post-processing. These capabilities include natural language rewriting, visual style transfer, tone modulation, and audio synthesis, enabling rich and flexible cinematic transformations. Emerging text-to-video pipelines further demonstrate the potential for fully generative cinematic sequences [7]. These developments suggest that future media distribution could shift from full video files to compact prompts and latent codes, enabling the direct integration of *CineMods* into playback systems.

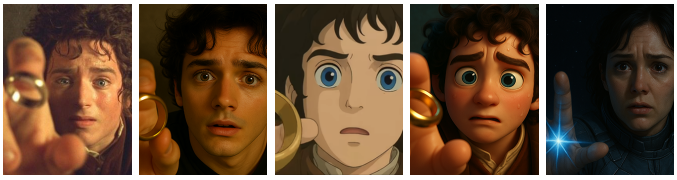

Figure 1. A single film scene reimagined in five distinct styles using generative AI: from the original *Lord of the Rings* frame to reinterpretations in modern, Ghibli [2], Pixar, and sci-fi aesthetics. These illustrate how *CineMods* enable stylistic and narrative reconfiguration of cinematic content.

III. Vision and Implementation

We envision a future in which films become modifiable media artifacts, open to personalization and reinterpretation by viewers or content providers. Inspired by game modding culture, users could alter aesthetics, mechanics, or narratives to create new experiences. In a cinematic context, such modifications might include visual changes (for example, rendering a realistic film in anime or noir style), substitutions of characters, voices, or settings, or the application of emotional filters and cultural adaptations. Genre shifts, such as turning a drama

into a comedy, represent the most comprehensive type of modification, as they typically require coordinated changes across multiple modalities.

The following algorithm illustrates a possible workflow for character-based style transformations within a film. For each scene, characters are identified and processed using a generative style transformer. To ensure consistency, once a transformation is generated, it is cached. This allows characters to retain a coherent visual identity throughout the entire film within the chosen mod style.

Algorithm 1 Character-Based Style Transformation in CineMods

```
Initialize empty style cache M
for each frame f ∈ F do
    for each character c ∈ C(f) do
        if c ∉ dom(M) then
            s ← P(c)              ▷ Generate style prompt
            a ← A(c, s)           ▷ Apply AI transformation
            M(c) ← a              ▷ Cache result
        end if
        Apply M(c) to c in frame f
    end for
end for
```

Formally Defined Notation:

Let:

- $F = \{f_1, f_2, \ldots, f_n\}$ denote the ordered set of all frames in the film.
- $C(f) \subseteq C$ denote the set of all characters detected in frame f, where C is the set of all characters appearing throughout the film.
- $P : C \to S$ be a function generating a style prompt $s \in S$ based on a character $c \in C$.
- $A : C \times S \to T$ denote the transformation function applying an AI-based transformation using prompt $s \in S$ to character $c \in C$, resulting in a transformed representation $t \in T$.
- $\mathcal{M} : C \to T$ denote a cache mapping characters to their assigned transformations.

The algorithm thus ensures:

$$\forall f \in F, \forall c \in C(f) : \quad c \in \text{dom}(\mathcal{M}) \Rightarrow \mathcal{M}(c) \text{ applied}$$

A familiar scene from The Lord of the Rings, for instance, could be rewatched in a distinct style (see Figure 1) such as anime, Pixar, or science fiction. While the core narrative remains, each version creates a different emotional experience, similar to how game mods offer aesthetic or tonal variation. In a sci-fi version, medieval weapons might be replaced with futuristic technology, and landscapes turned into alien worlds. Elements like costumes, lighting, and dialogue would adapt to preserve narrative coherence. These transformations show how *CineMods* can reshape film content while maintaining story engagement.

Technically, these modifications could be delivered in several ways. One approach involves real-time processing on smart TV devices, such as Android TV or Apple TV, where on-device AI modifies content during playback. Building on existing features like AI-based upscaling, this could be extended to support visual transformations, voice replacements, or tone adjustments. Alternatively, such functionality could be integrated directly into televisions. Studios might offer prerendered variants, while communities could contribute through officially supported remixing tools.

CineMods go beyond traditional style transfer by enabling deeper transformations across the full spectrum of cinematic expression. These include changes to genre, tone, pacing, characters, voices, language, plot, dialogue, and even the extension or rewriting of storylines, offering a fundamentally new form of personalized viewing. We propose a lightweight, interpretable structure, for example JSON-based, to define how and where modifications occur. These blueprints include time-stamped prompts, mod types (visual, audio, tone), and may reference specific models or presets to guide generative engines.

Effective personalization requires consistency across modalities. If a character's appearance changes, their voice and delivery should also adapt. A transformation cache can ensure coherence across scenes, episodes, or sequels. Genre shifts may involve coordinated changes in music, pacing, or lighting. A hybrid system of declarative manifests and adaptive engines could manage this complexity while preserving narrative integrity. In this vision, films become adaptable templates that respond to individual viewers. *CineMods* mark a step toward more participatory and emotionally responsive cinematic experiences.

While CineMods are conceptually rooted in fan culture and the creative remixing seen in game modding communities, their potential extends far beyond informal experimentation. If offered or supported by studios, broadcasters, or streaming platforms, such modifications could enable films to reach entirely new or previously underserved audiences. By adapting content for different age groups, cultural backgrounds, linguistic regions, or accessibility needs, CineMods can function as a powerful tool for inclusive storytelling and strategic audience expansion.

Modifications such as localized voice acting, culturally adapted references, or stylistic changes tailored to regional preferences may foster stronger identification and emotional resonance—particularly among audiences who are often underrepresented in mainstream media. As articulated in initiatives like I Want to See Me [8], personalized or culturally resonant media increases engagement by allowing viewers to see themselves reflected in the stories they consume. In this light, *CineMods* offer not only aesthetic variation, but also the potential to support diversity, representation, and emotional accessibility in cinematic experiences. In addition to supporting entertainment and personalization, CineMods hold significant potential in educational settings. They could allow educators to adapt documentary or narrative content to different learning

levels, cultural backgrounds, or teaching goals. This opens possibilities for more engaging, age-appropriate, and context-sensitive learning materials that retain narrative richness while meeting diverse pedagogical needs.

IV. Planned User Study

To assess the feasibility and desirability of *CineMods*, we plan an exploratory user study targeting both general audiences and media professionals. The study will investigate user expectations around film personalization, preferred types of modifications (e.g., visual style, tone, character), and openness to AI-driven content transformations. We are particularly interested in differences between preferences for user-generated versus studio-provided mods, as well as how factors, such as control, authorship, and trust influence perceived value.

Participants will be presented with mock-ups and short video prototypes illustrating possible *CineMod* transformations. These include stylistic re-renderings (e.g., turning a realistic scene into animation), character substitutions, and tonal shifts. Surveys and focus groups will gather feedback on appeal, emotional impact, and ethical acceptability.

In addition to audience research, we also plan to engage with creators, including directors, screenwriters, actors, and producers. These interviews aim to understand professional attitudes toward modifiable cinematic content, concerns around artistic integrity and identity, and the potential role of creative control and consent mechanisms in future *CineMod* platforms. The study will also gauge willingness to pay for mod-enabled experiences and explore whether personalization enhances or undermines the perceived artistic value of films. Insights from this study will inform both technical implementation priorities and broader questions around content governance, audience agency, and monetization strategies. The user study is currently in preparation. We plan to conduct parts of it in a film school environment. While no empirical findings are included in this version, results may inform future work.

V. Ethical, Legal, and Economic Considerations

The concept of *CineMods* introduces significant ethical, legal, and economic dimensions that must be carefully navigated. From an ethical and legal standpoint, AI-generated film modifications raise critical questions about copyright, ownership, and the need for consent from filmmakers and actors, especially in cases of manipulations akin to deepfakes. Central to these concerns is the preservation of artistic integrity, as creators and performers may regard their original works as finalized and intentional expressions. Unintended consequences, such as distortions of cultural narratives or the dilution of intended messages, must also be proactively managed through robust platform governance and adaptive legal frameworks. In particular, adapting films to reflect the preferences or identities of specific ethnic or cultural groups introduces new layers of ethical complexity, including the risks of stereotyping, cultural appropriation, or misrepresentation, all of which must be addressed with cultural sensitivity and ethical rigor. Economically, *CineMods* present both promising opportunities and notable challenges. They have the potential to generate new revenue streams by offering personalized film experiences, thus extending the lifecycle and enhancing viewer engagement. Nevertheless, this emerging practice faces complex licensing issues, the risk of intellectual property fragmentation, and potential resistance from established filmmakers and studios. Successfully implementing *CineMods* will require interdisciplinary efforts to address intertwined ethical, legal, and commercial considerations responsibly.

VI. Conclusion and Future Work

CineMods represent a potential shift in how films are consumed, moving toward a more interactive and personalized media experience. As generative AI capabilities evolve, the boundaries between viewer, creator, and content may blur. Interdisciplinary research is essential to address technical, legal, and cultural aspects.

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