

# RAPID DIGITAL FASHION PROTOTYPING: THE CASE OF MODDING IN YAKUZA KIWAMI

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**Professional paper:**

UDC: 391:7.05:004.9

DOI: 10.5937/tekstind2601054I



**Abstract:** Digital fashion is required for both video game developers and fashion designers to transmit aesthetics and engage with consumers via video game cosmetics, garments, or decals. The study looked into garments developed by Yakuza Kiwami's modding community to see how modding may be used as a prototyping tool for creating digital fashion in video games. Modding can be used for rapid prototyping due to the immediate in-game physics and fit-testing. After visually examining the current mods, the findings suggested that costumes developed by modders are effective for quick, low-cost reconstruction and visual evaluation. A monitored interaction with the modding community can help develop digital fashion design while following intellectual property regulations and user agreements. The study suggests more research on the amount of modding in other games for rapid prototyping, as well as an ethical framework for using mods to create digital fashion in video games.

**Keywords:** Digital Fashion, Prototyping, Video Games, Modding, Yakuza Kiwami.

## BRZO DIGITALNO PROTOTIPIRANJE MODE: SLUČAJ MODOVANJA U IGRI JAKUZA KIVAMI

**Apstrakt:** Digitalna moda je neophodna i programerima video igara i modnim dizajnerima kako bi preneli estetiku i angažovali potrošače putem kozmetike za video igre, odeće ili nalepnica. Studija je ispitala odeću koju je razvila zajednica modera Jakuza Kivami kako bi se videlo kako se modovanje može koristiti kao alat za prototipiranje za kreiranje digitalne mode u video igrama. Moding se može koristiti za brzo prototipiranje zbog neposredne fizike u igri i testiranja pristajanja. Nakon vizuelnog pregleda trenutnih modova, nalazi sugerišu da su kostimi koje su razvili moderi efikasni za brzu, jeftinu rekonstrukciju i vizuelnu procenu. Praćena interakcija sa zajednicom modera može pomoći u razvoju digitalnog modnog dizajna uz poštovanje propisa o intelektualnoj svojini i ugovora sa korisnicima. Studija predlaže više istraživanja o količini modovanja u drugim igrama za brzo prototipiranje, kao i etički okvir za korišćenje modova za kreiranje digitalne mode u video igrama.

**Ključne reči:** Digitalna moda, prototipiranje, video igre, modovanje, Jakuza Kivami.

### 1. INTRODUCTION

Digital fashion refers to digitally manufactured apparel, and accessories which can be utilized and interacted with predominantly through digital and cyberspace [1]. During the COVID-19 epidemic, fashion businesses were compelled to adapt and innovate, leading to an increase in digital fashion practices [2]. Retailers are adopting digital methods like as Virtual Reality, Augmented Reality and 3D prototyping, as well as using game design components in non-gam-

ing situations for psychological and motivational purposes [3,4]. Beyond that, virtual avatars are digital illustrations of the user, and the manner in which they are presented may influence one's negotiation abilities. Digital fashion includes skins for gamified surroundings, avatars with superimposed visualizations, Augmented Reality alterations, NFTs (Non-Fungible Tokens), and digital twins [5]. As digital fashion expands the notion of the individual, how the avatar appears not only develops the concept of the user but it also aids with self-representation and expression. This

means that the avatar, together with digital fashion options, can have a double 'layer' of self-expression: one through avatar selection (e.g., skin, hair, type body, etc.) and the other through digital clothes [6]. Digital fashion exists in virtual contexts and is not constrained by physical limits, unlike actual clothing.

In today's video games, creating avatars, designing clothes, and dressing them up are common features. As video games have become widespread media, the possibilities of expressing oneself in virtual spaces become increasingly obvious [7]. Videogames influence various criterias of digital fashion [8]. Video game genres such as massively multiplayer online role-playing game, or MMORPG, focuses on dressing up players' characters in virtual clothing and accessories to improve gameplay for aesthetic purposes [1]. Video game skins can be used as virtual clothes, accessories, or to complete a character's appearance [9]. Skins convey a character's position and cosmetic purpose. MOBA (Multiplayer Online Battle Arena) and Battle Royale have increased the popularity and commercialization of video game skins. Video games also allow you to create bespoke clothing for the players' avatar to wear during gaming [1]. Fashion in video games has grown into a big element of one's personality, with gamers often prioritizing it over their real-life expression [10]. Dressing an avatar in a virtual world is a new embodied practice that allows users to express their individuality and establish themselves in a virtual social context. To address the abstracted nature of digital fashion, researchers are exploring tactile systems that replicate fabric textures and provide input, aiming to enhance the multisensory experience. The protagonist's attire from any video game frequently reflect the fashion trends of the time and locale shown in that video game, as well as the protagonist's respective identity [11].

In recent years, mods have been as a prototyping tool for digital fashion in video games. Video game modding is the process of non-professionals modifying or adding to games. Mods may appear to violate end-user license agreements, but they can expand the game's scope and innovation, increasing its appeal to users [12]. Video game modding may be a complex collaborative effort between corporations and modders. Given the benefits and drawbacks of video game mods, it is possible to conclude that mods utilized for cosmetic or digital fashion purposes benefit all parties involved [13]. Contemporary commercialized 3D garment prototyping software necessitate costly subscription-based licenses, creating a significant barrier for independent designers, students, and small fashion teams looking to prototype concepts. Furthermore, attaining precise pattern making in 3D prototyping software requires a sub-

stantial allocation to pattern creation, fabric simulation configuration, and 3D mapping. Designers may need to model shading, textile characteristics, and material draping from scratch and export the 3D prototype into another program before deciding on the final design. Modding tools are usually free, and the basic game is a one-time purchase, making it an exceptionally cost-effective setting for experimentation. The fundamental character model has already been rigged, weighted, and tested. Modders can avoid the time-consuming initial rigging steps by swapping out simple assets (meshes and textures) on already functional 3D skeletons. The engine already includes established physics, lighting, and environmental rendering. Any texture or mesh update is immediately visible under live, contextual conditions. This delivers rapid, comprehensive visual feedback, which is essential for aesthetic testing. Mods can contain additional game models, textures, sounds, mechanics, or a complete revamp of the commercial product [12].

This study aims to explore the potential of modding as rapid prototyping tools for digital fashion, utilizing the video game Yakuza Kiwami as a case study. The study visually analyzes the modding community's contributions of attire modeling in Yakuza Kiwami. The visual analysis enables a full assessment of highly detailed simulated apparel as an intellectual property reflecting the aesthetics of digital fashion.

## 2. EXPERIMENTAL

### 2.1. Game Context: Yakuza Kiwami

Yakuza, commonly referred to as Ryu Ga Gotoku (Like A Dragon) in Japan, is an action-adventure game developed by Ryu Ga Gotoku Studios and published by SEGA. The title Yakuza was used for overseas markets until the publication of Like a Dragon: Infinite Wealth in 2024, although Like a Dragon has been the series' name in Japanese markets since its start in 2005 [14-16]. For the sake of simplicity, the title Yakuza is utilized throughout the study. In 2016, the studio created Yakuza Kiwami, a remake of the franchise's original game, which was released in 2005 [15,17]. Aside from compelling gameplay and captivating narratives, one distinguishing feature of the Yakuza series is the realistic conversion of real-world landscapes into virtual worlds [18,19]. Yakuza Kiwami portrays the Japanese culture throughout the game's environment, in-game items, narratives, and various activities. The in-game clothing system reflects the extravagant fashion designs utilized by organized criminal families to demonstrate authority, with the protagonist Kiryu Kazuma commonly wearing suits.

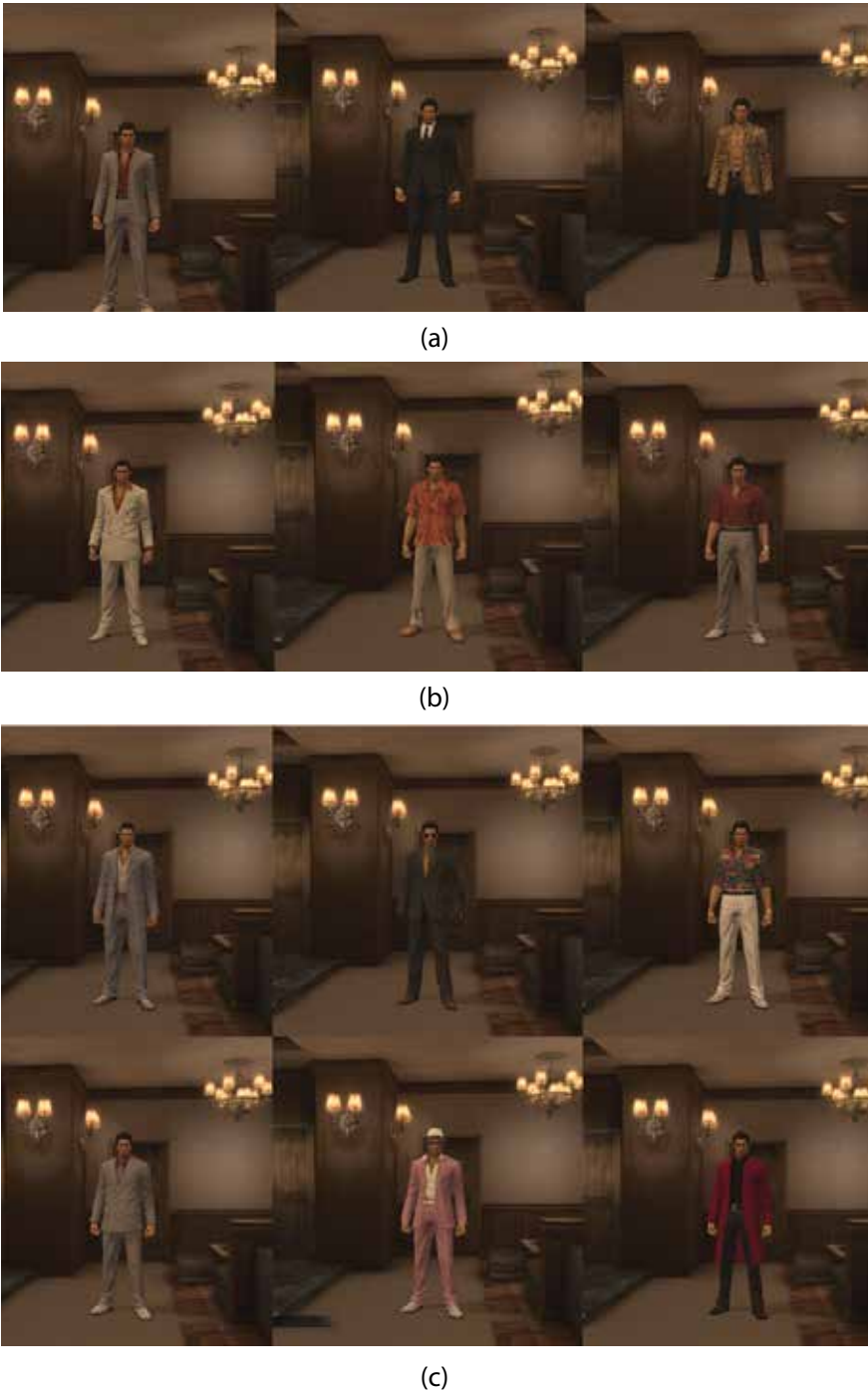
2.2. Research Method

Yakuza Kiwami was selected as the case study due to its active modding community and diverse collection of altered outfits that emulate digital fashion inside the video game. The game engine of Yakuza Kiwami allows rapid modding in Blender software by altering existing meshes of attires. Mods available from ‘Nexus Mods’ were used in this research [20]. Visual data was gathered from in-game screenshots while playing Yakuza on a normal gaming platform. The images of protagonist Kiryu Kazuma’s outfit were taken in a meticulous manner. Total twelve screenshots were selected based on ensemble visibility, value, and variety in garment styles including the in-game attires. The use of screenshots of those outfits was a deliberate methodological choice to align with the study’s specific focus. The goal was not to provide a comprehensive database of all in-game apparel, but rather to demonstrate the feasibility of modding in response to the protagonist’s clothing. These screenshots enable for a detailed visual inspection of clothing style, materials, colors, and accessories.

3. RESULT AND DISCUSSIONS

This study presents the potential of modding as rapid prototyping tool by observing the visual data collected from the modding community of Yakuza Kiwami. The visual analysis was primarily based on evaluating the details of simulated apparels to relate with digital fashion concept. Figure 1(a) depicts the in-game wardrobe accessible in Yakuza Kiwami, which only includes three varieties of apparel. However, these limited clothings are utilized as base mesh for rapid prototyping among

the modding community. Figure 1(b) displays outfits from other Yakuza games generated by modders. Despite these outfits were generated in different game engines, visualizing them in a common game engine provides a better insight by demonstrating the fabric texture, patterns, and silhouette. These clothings can also offer as base mesh for further rapid modifications which can be observed in the following figure. It can be observed that these attires consist new silhouette



**Figure 1:** Attires of Kiryu Kazuma in Yakuza Kiwami; (a) in-game clothings, (b) clothings of Kiryu Kazuma from other Yakuza games developed by modders, and (c) miscellaneous clothings of Kiryu Kazuma developed by modders.

compared to the attires shown in figure 1(a). Which indicates major modifications instead of simple re-coloring of in-game meshes.

Figure 1(c) demonstrates various attires based on Kiryu Kazuma's character model. It can be seen that some of these outfits i.e. suits are quickly prototyped, with modders using re-colors of existing meshes, while some of these attires, such as trench coats, patterned shirts, with accessories like hats, and shades demand more intricate implementation of new silhouettes, which is an important aspect of fashion prototyping. These modifications enable cost-effective replication and aesthetic testing compared to existing commercial 3D prototyping software. Since the character model is already pre-rigged and weighted, the modded attires can be immediately evaluated by the game engine's built-in simulation of light, movement, and friction. This provides designers to get rapid feedback and scope for researching market trends. Furthermore, modding allows to lower financial and skill barriers related with commercial 3D prototyping software due to interactive modding community. However, as mods are observed to show increased scope and innovation in rapid prototyping for digital fashion, it is absolutely necessary to monitor these mods to avoid violation of Intellectual Properties (IPs) and User Agreements.

#### 4. CONCLUSION

The study confirms modding as an effective prototyping tool for digital fashion design in Yakuza Kiwami. The various attires developed by modders offer novel insight in users' aesthetic regarding clothing styles, fabric materials, patterns, and accessories in the game. The finding suggests both developers and fashion designers can be benefitted by collaborating with the modding community under active monitoring. It is also necessary to consider that these mods do not violate laws and regulations of Intellectual Properties (IPs). An effective collaboration between developers and the modding community can be suggested to address this issue. The study's biggest drawback is its focus on the protagonist, Kiryu Kazuma, which may lead to bias. The research relies on a small set of screenshots chosen for their visibility and narrative value. This method accurately reflects Kiryu's attire and its suitability for his physical structure, but it falls short of providing a thorough overview of Yakuza fashion. The absence of other characters' clothes, such as those from competing yakuza families, significantly limits the scope of comparison for further analysis. Due to technical limitations, visual data was obtained via in-game screenshots. As a result, the proper de-

tails and textures of the clothing are determined by the screenshots' quality and resolution. The analysis focuses solely on the protagonist due to difficulties in monitoring non-playable characters (NPCs) with limited movement, visibility, and camera angle. Furthermore, the study lacks quantitative content analysis to supplement qualitative conclusions. Recent entries of the Yakuza or Like A Dragon Series can offer further research opportunities in this regard with an ethical agreement of utilizing mod to design digital fashion in video games.

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Primljeno/Received on: 09.01.2026.

Revidirano/ Revised on: 20.02.2026.

Prihvaćeno/Accepted on: 20.02.2026.

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