

MA Commercial Music Producer

Exploring the Intersection of Music and Gaming: The Creation of DJ Paws

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This assignment aims to create a playable rhythm game utilising Unity and Fmod. Throughout this project, I have implemented skills acquired from various modules in my studying while also leveraging my passions for both music and gaming.

In my artistic career, I aspire to incorporate video games as a unique platform for sharing my music. While live concerts provide an immersive experience, they often limit the artist's and individual fans' interactions. By creating playable experiences centred around my music, I intend to bridge the divide between artist and fan. The fusion of music and gaming offers an exciting opportunity to engage fans in a way that extends beyond traditional means, as players will be able to experience my music dynamically and interactively, actively participating in creating unique soundscapes. By allowing players to manipulate audio elements, apply effects, and explore different genres, the game becomes a canvas for self-expression and musical exploration. Furthermore, the medium of video games provides a new distribution channel for my music, offering a fresh and immersive way for fans to engage with my music. They can dive into the game world, discover hidden tracks, and unlock exclusive content, creating a deeper connection and sense of ownership over the music.

Through this project, I aim to tap into the potential of video games as an artistic medium, blending music and interactive experiences. By creating a playable rhythm game, I take a step toward realising my vision of merging music and gaming, providing a unique and captivating experience for players while expanding the boundaries of my artistic career.

In the subsequent sections of this essay, I will delve into the technical aspects of the project, detailing the implementation of various game mechanics, audio integration, visual elements, and the overall development process.

The project encompasses three critical areas for its successful realisation: 3D rendering and game development using Unity, music composition and integration, and FMOD audio middleware. These three components work in tandem to create a captivating and interactive experience for players.

When considering what type of game to create, I drew inspiration from unique and unconventional titles like "Octodad" and "Trombone Champ." These games showcased the potential for combining humour, quirky mechanics, and engaging gameplay. With this in mind, I created a lighthearted rhythm game to capture the player's imagination and provide a fun and immersive experience. One of the key considerations during the conceptualisation phase was striking a balance between skill-based progression and accessibility. I wanted the game to offer a sense of accomplishment and growth as players improved their DJ skills, but I also wanted it to be approachable for players of all skill levels. This meant designing intuitive controls and gameplay mechanics that allowed for immediate enjoyment and experimentation.

The game's premise revolves around a cat DJ, injecting a playful and whimsical element into the experience. Players could immerse themselves in a world of music and creativity by embodying a feline character. The aim was to create a game that could be a delightful distraction, perfect for short bursts of play to unwind and have fun. However, I also wanted to provide depth and challenge for those who wished to invest more time and effort into mastering the game.

Including various buttons and faders in the DJ set was a deliberate choice to offer players various interactive elements. I wanted to evoke a sense of exploration and experimentation, where players could discover each control's unique effects and combinations on the music. This approach encouraged players to engage with the game on their own terms, fostering a sense of discovery and creativity.

The progression in DJ Paws is designed to be organic and rewarding. The game ensures satisfying growth by allowing players to learn and improve their skills at their own pace. Whether it is simply enjoying the music and bopping along to the beats or delving deeper into the mechanics and

mastering intricate mixes, the game accommodates casual players and those seeking a more challenging experience.

DJ Paws aims to provide an inclusive and enjoyable experience for players of all backgrounds and skill levels by creating a game that balances lightheartedness and skill-based gameplay. It is a game that can be enjoyed in short bursts for pure fun or pursued as a creative outlet for those passionate about music and rhythm. The decision to incorporate a backstory into DJ Paws stemmed from the desire to create a stronger connection between the player and the game's character. I wanted to add a lighthearted touch to the rhythm game experience. By introducing the concept of a cat DJ who unexpectedly takes over the show despite having no prior experience, players are invited to step into the shoes of this unlikely hero. This backstory serves to immerse players in the game world and foster a sense of empathy and curiosity. It adds an element of surprise, humour, and relatability, ensuring that players enjoy the game as a playful distraction while embracing the opportunity to improve their skills and engage with the unique gameplay mechanics.

Originally a video was recorded and produced to act as a cut scene to introduce the game. However, errors occurred within Unity, and I could not get the video to play without running into critical errors. I then decided to take some screenshots, add them to the game as posters on the wall, and build a walkway to the stage, serving two purposes. Firstly, it provided a concrete pathway for players to navigate the game world, building anticipation and excitement as they approached the stage. The gradual increase in volume from the crowd added to the immersive atmosphere, heightening the sense of being in a live music setting. Secondly, the walkway served as a narrative device.

I began work on rendering and game development as this area was the most complex and unknown to me.

I decided to present the game from a first-person perspective to enhance the player's immersion. This led me to focus specifically on the elements I needed to model: the DJ set and the player's paw. To ensure a streamlined workflow, extensive research was conducted on the optimal techniques for model creation, rigging and integration into Unity by leveraging the versatility of iPad apps, such as Nomad Sculpt and Procreate. One of the key advantages of using Nomad Sculpt was its automatic unwrapping feature, which streamlined the process of preparing the models for texturing. This feature was particularly valuable considering the time constraints of the assignment. Once the paw and DJ set were sculpted, I exported them to Procreate, a painting app on the iPad that offered the ability to paint 3D objects. In Procreate, I applied textures to the models, adding visual details and enhancing their overall appearance. The models were sculpted, painted and prepared for further refinement.

Blender was pivotal in addressing rigging challenges and reducing the model's topology through decimation. However, even though rigging was performed within Blender, I could not incorporate this aspect into the final game due to time constraints.

Regarding the sizing of the models, meticulous attention was given to the player's interaction and comfort. The goal was to enable seamless access to all buttons and faders while maintaining a realistic range of movement for the player's character. Iterative adjustments were made until an optimal balance was achieved.

The control system posed an intriguing challenge, necessitating careful consideration and exploration of various approaches. Ultimately, the DJ set's dominance in the player's field of view necessitated the implementation of character movement. I wanted the player to be able to take in the atmosphere around them and move around within the environment. This was because I wanted the game to feel less "arcadey." As I researched rhythm games for inspiration, I noticed that most games on the market place the player within set boundaries and very rarely give control of the character to the player. This decision likely relates to the need for precise input speeds and accuracy, as rhythm plays a crucial role in these games. My inspiration, however, steered me in a different direction. I drew inspiration from games such as *Octodad* and *Trombone Champ*, taking note of their "silliness"

and the challenge of mastering proper movement, particularly from Octodad. I aimed to incorporate these elements into my game design.

A novel control scheme was devised to facilitate the smooth movement of the character's arm. The arm's position remained fixed by designating the arm as a child object of the player's camera, enabling players to adapt and aim accurately and quickly. Additionally, the mouse scroll wheel input provided depth-axis movement, enhancing access to faders and introducing a skill-based element to the game. Mastering the simultaneous arm extension and character movement became a gratifying challenge as the player grew accustomed to the mechanics.

A second paw was introduced to enhance the player's immersion in the feline DJ persona.

Within Unity, I created interactive faders and buttons. By utilising the transform component of each object, I could precisely control their movement and position within the game environment.

I implemented scripts restricting their movement within specific ranges to ensure the faders functioned smoothly and realistically. By setting maximum and minimum values for each fader's position along the designated axis, I ensured they would stop precisely at their intended endpoints. This allowed players to precisely manipulate the faders and replicate the tactile experience of adjusting volume levels and effects.

In addition to the faders, I integrated scripts for the effects and one-shot buttons to enhance their visual feedback. When a button was activated, such as when an effect was toggled on or off, its colour dynamically changed to indicate its status. This visual cue provided immediate feedback to the player, allowing them to quickly discern which buttons were active at any given moment. By adding these script-driven colour changes, I aimed to enhance the visual appeal of the DJ console and create a more immersive and interactive experience for the players.

In order to create a vibrant and dynamic crowd within the game, I encountered a slight setback.

Initially, I had planned to add the crowds as 2D sprites. However, I realised I had created the project as a 3D-only project, so I could not directly use 2D sprites. However, I quickly found a solution by adding the crowds as UI elements instead.

To make the crowd come to life, I implemented some visual effects. I divided the crowd image into layers and applied parallax scrolling to each layer. This gave the illusion of depth and movement within the crowd. Additionally, I introduced random movements by programmatically shifting and rotating certain sections of the crowd image. These subtle variations prevented the crowd from appearing static and added to the overall liveliness.

When writing scripts for the various functionalities and interactions within the game, I encountered a challenge in finding appropriate learning resources. The available tutorials and guides either seemed too specific, focusing on isolated problems, or too vague, requiring extensive study hours to grasp the entire concept.

In order to streamline my script development process and ensure efficient progress, I turned to AI language models. These models, such as GPT-3.5, offered a unique solution by providing me with a powerful tool to generate code snippets and script templates. I could describe the desired functionality, and the AI model would assist me in producing the necessary script.

I significantly reduced the time and effort spent on scriptwriting by leveraging AI language models. It allowed me to access vast programming knowledge and expertise distilled into user-friendly responses. Instead of sifting through extensive documentation or spending countless hours watching tutorials, I could now focus my energy on refining and implementing the generated scripts, accelerating my development process.

This innovative approach facilitated the creation of complex scripts and expanded my understanding of programming concepts. The AI model's ability to generate code snippets and provide context-specific guidance enabled me to overcome scripting challenges and advance my project confidently.

Using AI language models proved to be a valuable asset in my game development journey. It expedited the scriptwriting process and empowered me to leverage the collective knowledge of the

programming community, helping me overcome obstacles and enhance the overall quality of my project.

While creating the tracks for the game, I focused on ensuring that they were well-suited for the gameplay experience. As a DJ rhythm game, the tracks needed a consistent tempo and timing, allowing players to mix them seamlessly.

To achieve this, I meticulously worked on both tracks in Ableton, carefully adjusting their tempo and aligning their beats. I also experimented with removing some aspects from one track and blending them with the other to create a harmonious fusion. By strategically selecting and manipulating the different elements of each track, I aimed to provide players with an intuitive and enjoyable mixing experience.

Simplicity was a crucial consideration in the track design. I wanted the songs to be easily comprehensible, allowing players to understand their structure and elements quickly. By keeping the arrangements straightforward, I ensured that players could focus on mastering the mixing techniques and building their skills within the game.

Moreover, I wanted the songs to have a predictable pattern regarding where the drops and transitions occurred. This deliberate design choice allowed players to anticipate critical moments in the tracks, enhancing their ability to execute seamless transitions and create dynamic mixes. By providing a clear structure and recognisable cues, I aimed to empower players to develop their sense of timing and musical intuition.

Overall, my approach to creating the tracks for the game involved meticulous attention to tempo, timing, and simplicity. By carefully crafting the songs and incorporating predictable elements, I aimed to provide players with an engaging and accessible mixing experience to facilitate their enjoyment and growth within the game.

When it came to the audio effects in the game, I wanted to create a dynamic and immersive experience for the players. To achieve this, I turned to FMOD, an industry-leading audio middleware tool that allowed me to connect various effects to the faders and buttons within the game.

After careful consideration, I decided on a set of effects to enhance the DJ experience and provide players with a wide range of creative possibilities. These effects included reverb, delay, flanger and bit crusher.

For the faders, I decided volume, HP-LP filter and compression to be suitable variables. Each effect was assigned to the corresponding faders and buttons, allowing players to manipulate and shape the audio in real-time.

Implementing these effects using FMOD required me to create audio events and parameters within the FMOD Studio tool. This allowed me to establish the necessary connections between the game's interface and the audio effects. By mapping the faders and buttons to their respective effects parameters, I enabled players to control and modify the sound during gameplay dynamically.

Integrating these effects came with its fair share of challenges. One of the critical hurdles was ensuring that the effects responded accurately and smoothly to the faders' movement and the buttons' activation. It took meticulous fine-tuning of the parameter settings and script logic to achieve seamless transitions and responsive audio changes.

When initially exploring the implementation of the HP-LP filter, I contemplated using separate faders for the high-pass and low-pass filters. However, as I delved deeper into the design, I realised I could achieve a more intuitive and seamless control scheme. Instead of using separate faders, I used a single HP-LP filter parameter, employing reversed automation curves. This approach allowed me to create a cohesive and fluid user experience, where moving the fader in one direction would increase the effect of the high-pass filter while simultaneously reducing the influence of the low-pass filter and vice versa. By employing this technique, I achieved a more dynamic and intuitive control scheme for the HP-LP filter, enabling players to effortlessly shape the frequency spectrum of the music as they mix and perform.

The knowledge and experience gained from working with the HP-LP filter proved invaluable in developing another essential feature—the fader that seamlessly transitions between the two songs. Leveraging the concept of reversed automation curves, similar to the HP-LP filter, I created a fader that intuitively controlled the volume balance between the two tracks. By employing the same opposite automation curve technique, moving the fader to one side increased the volume of one song while decreasing the volume of the other, and vice versa. This approach provided a smooth and natural transition between the tracks, enabling players to blend the music and craft seamless mixes effortlessly. The familiarity gained from working with automation curves and parameters in FMOD allowed for a streamlined development process, ensuring a cohesive and intuitive user experience throughout the game.

In pursuing a unique and diverse array of effects for the game, I encountered a challenge when implementing the bit-crushing effect. FMOD did not offer a dedicated bit-crusher effect, so I had to employ a creative approach to achieve the desired outcome. After thoroughly exploring the available effects in FMOD, I discovered that a combination of distortion, filter sweep, and time warping could simulate the characteristics of a bit-crusher effect. I could replicate the distinctive lo-fi, degraded sound associated with bit-crushing by carefully manipulating these parameters and applying them to the audio signals.

The game also features buttons that trigger one-shot sound effects alongside the interactive faders and effects. These buttons were strategically placed within reach of the player's arm movement, facilitated by the scroll wheel control for quick navigation. The selection of one-shot sounds was carefully curated to encompass a combination of familiar clichés and rhythmic elements. By incorporating these sounds, the game fosters a lighthearted and comedic atmosphere, enhancing the overall player experience. These one-shot sound effects serve as an additional interaction layer and allow players to synchronise their actions with the music, resulting in a satisfying and engaging gameplay loop.

Additionally, I paid particular attention to the audio design for the crowd in the game. I wanted to recreate the energetic atmosphere of a lively club, so I carefully selected crowd sound samples and crafted audio layers to simulate the sounds of cheering, applause, and excitement. By adjusting the volume and spatialisation of the crowd audio, I aimed to enhance the immersion and replicate the feeling of performing in front of a live audience. I also added a small easter egg within the game for hitting the play button too many times, resulting in the crowd booing the performance.

Throughout the development process, I continuously iterated and tested the audio effects and crowd audio to ensure they harmonised seamlessly with the gameplay.

During the beta testing phase, valuable feedback was gathered from a select group of players, providing further insights to enhance the game experience. One of the significant issues highlighted was the camera movement, which was perceived as too slow. Taking this feedback into account, adjustments were made to increase the responsiveness and fluidity of the camera, allowing for more immersive and dynamic gameplay.

Additionally, a participant remarked that the game had a somewhat eerie ambience, possibly attributed to the appearance of the paws, which featured long claws. To address this concern, a redesign of the paws, opting for more vibrant and rounded shapes that aligned better with the lighthearted nature of the game, could be implemented. These visual alterations could establish a more appealing and welcoming aesthetic.

Another aspect that emerged from the beta testing was the perceived sluggishness of the character's movement. To address this, optimisations could be implemented to enhance the character's speed and responsiveness, ensuring that players could navigate the environment with greater agility and enjoyment.

Some players struggled with the faders and buttons, wanting clearer feedback and interaction cues. In response to this feedback, animation cues could be introduced between the arm movement and the corresponding faders and buttons, providing players with a visual indication of the impact of their actions. Implementing a rigging component of the character's paw in Unity would also help

with this issue. This adjustment would improve the responsiveness and intuitive nature of the game controls.

Furthermore, some participants expressed frustration over the need for more instructions or guidance on the functionality of the buttons and faders. However, it is worth noting that this feedback was collected before implementing the storytelling element in the game. With the introduction of a narrative context that portrays the game's character as having limited knowledge, players are now provided with a sense of discovery and exploration, encouraging them to experiment and uncover the functionality of the various buttons and faders organically.

Looking ahead to the game's future, several exciting improvements and features could be implemented to enhance the experience further. One notable addition would be introducing higher difficulty levels that incorporate unmatched songs. Players would face a more significant challenge in seamlessly blending the tracks by including songs that do not follow the beat-matching pattern. This would allow more experienced players to test their skills and elevate the overall difficulty curve of the game.

Another promising avenue for development is the implementation of cooperative gameplay. By allowing two players to work together simultaneously, the game could foster a sense of teamwork and collaboration. Coordinated mixing and synchronisation between players would facilitate more precise mixing and introduce an engaging social element to the gameplay experience. To enhance the overall visual presentation of the game, incorporating animation cues could provide an added layer of polish. These cues, such as visual effects or character animations tied to specific actions or events, would further immerse players in the game world and contribute to a more dynamic and captivating visual experience.

Introducing a point system would be a valuable addition to the game mechanics. Assigning points based on the accuracy and timing of fader and effect manipulations would create a sense of achievement and progression for players. This gamification element would enhance replayability and motivate players to improve their skills continuously and strive for higher scores.

Considering the game's potential release on platforms like Steam, community engagement would be crucial. Allowing players to contribute their own songs to the game's soundtrack would diversify the available music selection and foster a sense of ownership and creativity within the community.

Additionally, collaborating with well-known DJs to incorporate their songs into the game through sponsorship programs would increase the game's visibility and attract a wider audience.

By continuously expanding and improving the game through updates and community involvement, the possibilities for growth and innovation are vast.

In conclusion, the journey of creating this game has been an invaluable experience for me in terms of game and audio design. Despite the game's current state being less polished than initially envisioned, the process has given me a wealth of knowledge and skills in a relatively short time. While the game may still be considered a work in progress, it remains playable and offers a unique experience that needs to be added to the market.

Reflecting on the project, I recognise the areas where more time and refinement could have been beneficial. However, I am considering continuing to work on the game and releasing it as an early-access title on Steam. The game's distinctive concept and gameplay mechanics, combined with the potential for further development and refinement, make it a promising endeavour.

By embracing the early access model, I would have the opportunity to involve the community in the game's development, gathering feedback and suggestions to guide future updates and improvements. This iterative process would allow me to shape the game based on player preferences and refine it into a more cohesive and engaging experience.

Furthermore, the market currently needs a game that combines the elements of rhythm-based gameplay, DJ simulation, and immersive audio design that my game offers. By capitalising on this unique selling proposition, the game has significant potential to resonate with a niche audience and garner a dedicated following.

While acknowledging that there is still work to be done to realise the game's potential fully, I am excited about the prospects. With further dedication and refinement, the game could become a successful venture, capturing the interest of players who seek a different and immersive gaming experience.

In summary, this project has not only expanded my skills and understanding of game and audio design. However, it has also sparked a passion for pursuing further endeavours in the intersection of music, gaming, and interactive experiences. With a continued focus on development and community engagement, I am eager to see the game evolve into a unique and successful creation that resonates with players and is a testament to my growth as a game developer.

References

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