



Sunakanandam (A Dog's Happiness): Experimenting with Hand-drawn Animation in Cinematic Virtual Reality

Maharshi Gautam Peesapati*¹  and Delwyn Jude Remedios² 

¹ Department of Design, Indian Institute of Technology Hyderabad, Kandi, Telangana, India.
gautam160691@gmail.com

² Department of Design, Indian Institute of Technology Hyderabad, Kandi, Telangana, India.
delwyn@des.iith.ac.in

Abstract. This research uses reflective documentation [1] to experiment with hand-drawn animation in Cinematic Virtual Reality (CVR) [2] to understand the convergence of the classical technique in emerging media. Sunakanandam (A Dog's Happiness) [9], a Telugu song was selected for translation into a hand-drawn animated music video in CVR. The CVR experience, Duet [3] was a novel innovation in hand-drawn animation that represented a boy and a girl's journey to adulthood, giving the navigator [7] the freedom to follow any character. However, for aesthetic and contextual reasons, the project focuses more on the characters, and the backgrounds are suggestive sketches that morph into different scenes. One of the advantages of the VR format is the spatial immersion [10]. The project Sunakanandam seamlessly depicts two worlds in 360-degree space: a gated society in contrast to a street. In the story, a street dog aspires to enter the gated community for a better life. While juxtapositions through split-screen have been commonly explored in conventional cinema, the scope of 360-degree space as a split-screen lacks representation [4]. The findings reflect upon considerations towards staging, key-framing, in-between animation, camera angles and transitions for hand-drawn 360-degree spatial storytelling. This research encourages hand-drawn artistic approaches to emerging technologies.

Keywords: cinematic virtual reality; hand-drawn animation; music video; reflective documentation research; immersive storytelling.

1 INTRODUCTION

This paper explores the convergence of a classical artistic medium, hand-drawn animation with an emergent technological platform, Cinematic Virtual Reality (CVR). It addresses the central research challenge of translating the established principles of traditional animation into a 360-degree spatial narrative environment, examining both the practical obstacles and the unique storytelling affordances that arise from this synthesis. To investigate this intersection, this practice-led research centered on the creation of Sunakanandam (A Dog's Happiness), a hand-drawn animated music video in CVR.

The project is an adaptation of a Telugu song that employs anthropomorphism to tell the story of Malli, a street dog whose desire to enter a gated community is fueled by a constant bombardment of visuals suggesting that pets within the gated community are happier (Figure 1). Advised against this pursuit by a wise old dog, Malli is nonetheless deter-mined. He ultimately enters the community only to discover that life within is dystopian and troublesome, a mere facade of happiness. Realizing the value of his freedom, he returns to the streets. Through this 360-degree narrative, the project explores themes of desire, liberty, and dissatisfaction that can accompany the pursuit of unattainable ideals.

The project's problem statement aims to culminate traditional animation techniques with virtual reality technology to create a musical experience that depicts the human desire for things that are out of reach, while simultaneously ignoring the value of resources already possessed. The song's lyrics and music serve as the primary catalyst for the visual and emotional journey.



Fig. 1. Poster and Character Design
(Personal Documentation)

This paper will first outline the theoretical and artistic precedents that informed the project. It will then detail the practice-led methodology, documenting the production process from concept to final composite. This paper presents a reflective analysis on the potential of hand-drawn art in immersive media.

2 LITERATURE REVIEW

To situate the Sunakanandam project within the broader academic and artistic landscape, a review of the narrative tradition and immersive media is essential. This review provides a foundational framework for the project's thematic development, research through practice, storytelling strategy, and technical execution.

2.1 The Potential of Anthropomorphism in Narrative Storytelling

The use of animal characters to explore complex human themes has a rich history, and two works were particularly influential in shaping the project's narrative approach.

The Panchatantra [8]. This ancient Indian collection of fables stands as a pioneering work in the use of anthropomorphism for didactic and moral storytelling. The effectiveness of these tales, which use animal protagonists to generate interest and impart relatable morals, has endured for over two millennia. This long-standing tradition of impactful storytelling directly influenced the decision to use an animal protagonist in Sunakanandam to explore themes of desire and contentment.

The Jungle Book [6]. Walt Disney's animated feature film played a pivotal role in popularizing anthropomorphism for modern global audiences. For Sunakanandam, this film served as a crucial aesthetic and technical reference. Specific aspects were adopted from its animation style, including the studied exaggeration of both quadruped and biped locomotion and the highly emotive expressiveness of its characters, which were vital for conveying the story's emotional arc without relying solely on dialogue.

Anthropomorphism, as a concept and its emotional resonance with the audience and its effectiveness in conveying human emotions through animal characters not only played a vital role in the culmination of this project but also in the aesthetic that was developed.

2.2 Innovations in Cinematic Virtual Reality and Spatial Narrative

The project also drew heavily from pioneering works in the CVR space that have explored the unique capabilities of 360-degree storytelling.

Duet [3]. This Oscar-nominated short was a landmark experiment that brought a classical, hand-drawn aesthetic into a 360-degree environment. Its commendable use of virtual space to follow two characters on their life journeys affirmed that a handdrawn look could be achieved effectively in VR, providing a crucial affirmation for the artistic direction of Sunakanandam.

Pearl [5]. Another Oscar-nominated CVR short, Pearl offered a masterclass in the expert utilization of virtual space. The entire narrative unfolds from the fixed perspective of a passenger seat inside a car, demonstrating how a continuous, unbroken shot within a confined environment can tell a powerful, decades-spanning story. This film was a key learning experience for understanding filmmaking and staging techniques specific to VR.

Table For Two [7]. This work demonstrates the power of VR to present parallel interactive narratives. By allowing the navigator to assess a situation from different viewpoints in the same setting, it showcases how to convey a continuous story without any traditional film cuts. This technique of guiding audience attention between multiple simultaneous points of interest directly informed the core conceptual decision in Sunakanandam to present two contrasting worlds within the same 360-degree space.

The synthesis of these precedents includes combining the anthropomorphic tradition of The Panchatantra, the animation techniques of The Jungle Book, and the spatial narrative innovations of CVR experiences like Duet and Table for Two created the unique theoretical foundation upon which Sunakanandam was built. The design process of Sunakanandam aims to examine the considerations of hand-drawn animation in CVR.

3 RESEARCH THROUGH PRACTICE: THE PRODUCTION OF SUNAKANANDAM

This research adopts a reflective documentation methodology [1], to examine the production process of Sunakanandam, outlining the practical challenges, technical workflows, and artistic decisions made while merging 2D hand-drawn animation with a 360-degree CVR environment.

3.1 Conceptualization: From Lyric to Spatial Narrative

The project began with the translation of a Telugu song with ethnographic roots in the Telangana dialect. The central narrative contrast between the freedom of the street and the perceived luxury of a gated community posed a unique representational challenge. While traditional cinema might use a split-screen for juxtaposing these two scenarios, CVR offers an integrated solution. In Sunakanandam, the 360-degree space presented an opportunity for a "seamless split screen," allowing the audience to physically turn between the two contrasting worlds, thereby making the environment itself a central narrative element.

3.2 World Building in a Spherical Canvas

Creating the 360-degree environment required a specialized workflow. An equirectangular perspective grid was used to construct the foundational background in

a flat, 2:1 aspect ratio (Figure 2; Figure 3). This background was populated with quintessential elements from Hyderabad, including its distinctive rock formations, slums, and construction alleys, to ground the story in a specific locale.

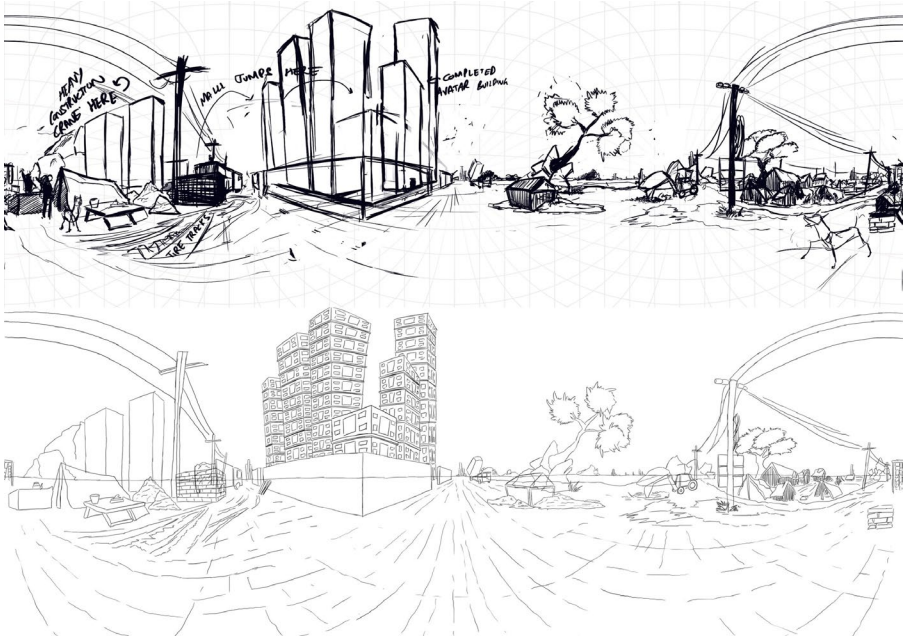


Fig. 2. Background sketching and cleanup on an equirectangular perspective grid
(Personal Documentation)



Fig. 3. Background with the street and the gated community
(Personal Documentation)

This flat 2D image was then imported into Adobe Photoshop and converted into a spherical panorama, enabling direct sketching in a 360-degree view. A significant technical limitation was discovered here: the inability to add new layers while working in the spherical perspective mode. The workaround involved a repetitive process of reconverting the 360-degree view back into a flat image to add layers for colour, light, and shadow before converting it back again for review.

3.3 Staging and Storyboarding for Immersion

Storyboarding for VR is fundamentally different from traditional filmmaking. Instead of composing for a fixed frame, the process involves utilizing the entire space as a stage. It became critical to choreograph action and design scenes that would actively guide the navigator's eye. This was achieved by creating contrast through color, establishing a clear visual hierarchy, and using character motion to draw attention to key plot points. A major technical problem was identified at this stage: when animated characters moved too far above or below the horizontal centerline (the "safe area") of the equirectangular view, they became severely distorted in the flat 2D working file, making them challenging to animate.

3.4 Animation: Traditional Craft in a Distorted Perspective

The core animation process involved a study of bipedal and quadruped locomotion, including comparative analysis of creatures like a dog versus a buffalo to understand the significant differences in their anatomical features and weights (Figure 4). The goal was to combine this realistic understanding of movement with the exaggerated features necessary for anthropomorphic storytelling.



Fig. 4. Animation frames of the characters
(Personal Documentation)

A key practical discovery was made in timing the animation to the music: the action needed to occur a few frames before the corresponding beat, as viewers perceive visuals slightly earlier than audio. The animation was produced at 24 frames per second (fps), with timing varied by creating new drawings on 1s (every frame), 2s (every two frames), or 4s (every four frames) to achieve different speeds of movement. Techniques such as smear frames were used to convey exaggerated motion, while loops of runs, trots, and walks were created and offset to produce variety efficiently. The perspective distortion identified in storyboarding remained a significant challenge, requiring a learning curve to animate characters like the watchman, who occupied the skewed upper and lower regions of the frame, while maintaining their volume and performance (Figure 5).

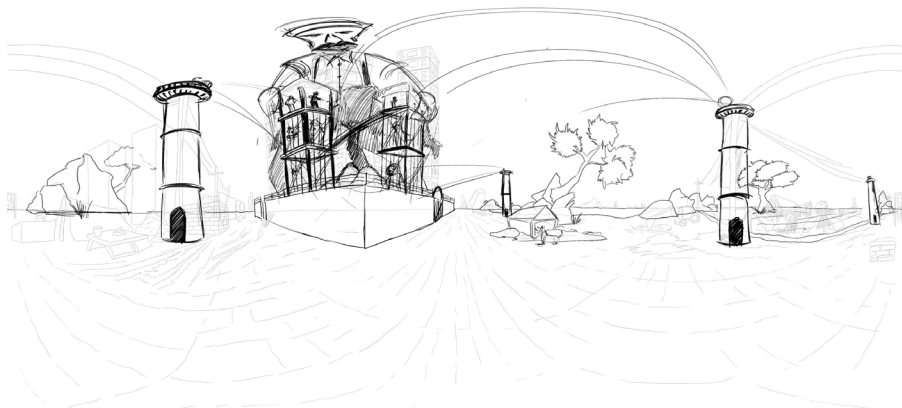


Fig. 5. Character distortion in 2D plane for top gaze
(Personal Documentation)

3.5 Finalizing the Experience: From Cleanup to Compositing

The final stages of production brought the various elements of hand-drawn animation in 360-degree background together into a cohesive whole.

Cleanup and Color. The rough animation frames were redrawn with clean lines. Techniques like "place and trace" were employed during this stage to maintain the solidity of characters' faces during subtle movements. These cleaned-up frames were then flood-filled with colour according to the established character model sheets (Figure 6; Figure 7).



Fig. 6. Cleaned-up frame 1 from the navigator's view
(Personal Documentation)

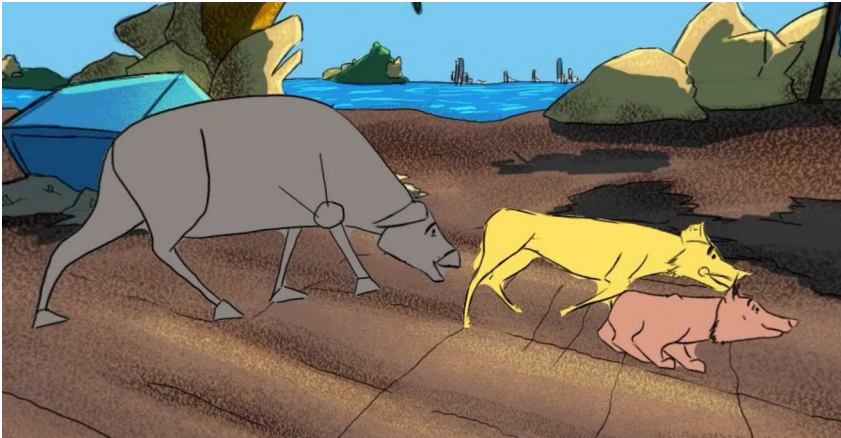


Fig. 7. Cleaned-up frame 2 from the navigator's view
(Personal Documentation)

Compositing. The final 2:1 aspect ratio background and the sequential animation layers were assembled in Adobe Premiere Pro. This composite was then rendered into the final CVR format for 360-degree viewing.

Iterative Testing. A crucial part of the process was a continuous feedback loop. At every major stage, the 360-degree video was exported, uploaded to YouTube, and tested on an Oculus VR device (Figure 8). This iterative testing was vital for refining the narrative flow, checking the staging, and ensuring a compelling navigator experience.



Fig. 8. Iterative Testing
(Personal Documentation)

The completion of this production process yielded not only a finished CVR music video but also a set of key insights derived directly from the practical challenges of this experimental workflow.

4 FINDINGS AND REFLECTIVE ANALYSIS

The practice-led creation of Sunakanandam generated several key insights regarding the considerations of hand-drawn, 360-degree spatial storytelling. These findings highlight both the challenges and the novel opportunities presented by the convergence of these two media.

4.1 Staging and Gaze Guidance in CVR

In traditional cinema, the director has control over the navigator's gaze through the fixed frame. In CVR, this control is relinquished. This experiment confirmed that guiding the navigator's focus requires a different set of tools. The effective use of strong colour contrasts, a clear visual hierarchy (placing the most important action in the most prominent space), and deliberate character motion proved essential in directing attention. The navigator's freedom to look anywhere necessitates a more intentional and dynamic approach to staging to ensure narrative coherence.

4.2 The Challenge of Key-framing and In-betweening in a Non-Planar Space

The most significant technical hurdle was the perspective distortion inherent in the equirectangular projection. Animating characters directly on the flat, distorted 2D background image while maintaining contact with the ground plane and ensuring

believability was a challenge. The solution required a hybrid workflow: key poses had to be authored directly within the 360-degree spherical view to ensure accurate proportions. These keyframes were then exported as static PNGs and imported into traditional animation software, where they served as guides for creating the in-between frames on a flat, albeit distorted, plane. This process underscores the need for new tools and techniques tailored specifically for 2D animation on a spherical canvas.

4.3 Rethinking Camera Angles and Transitions

The concept of "camera angles" is fundamentally altered in CVR. With the navigator at a fixed central point, traditional techniques like cuts are not applicable. Instead, transitions were achieved organically, leveraging the continuous nature of the virtual space. This was accomplished either through character movement guiding the navigator from one scene to another or through the background itself, where suggestive sketches would morph into new settings. This approach creates a more fluid and immersive narrative experience that is unique to the medium.

4.4 The 360-Degree Canvas as a Narrative Device

The project successfully demonstrated that the 360-degree canvas can function as a powerful narrative device. Using space as a "seamless split-screen" to juxtapose the worlds of the street and the gated community highlights the possibilities of 360-degree narratives. It allowed the central conflict of the story to be spatially represented, inviting the navigator to physically turn and compare the two realities. This technique offers a method for spatial storytelling that is unique to the CVR medium, capable of conveying thematic contrasts through immersion.

These findings contribute a practical, experience-based perspective on the challenges and possibilities of creating hand-drawn animation for CVR, bridging the gap between established artistic practice and emerging technological platforms.

5 CONCLUSION

This research began with the objective of investigating the convergence of classical hand-drawn animation with the emerging technology of Cinematic Virtual Reality. Through a process of reflective documentation centered on the production of the CVR music video *Sunakanandam (A Dog's Happiness)*, this paper has detailed the practical challenges and unique creative affordances of this hybrid medium.

Sunakanandam demonstrates that the principles of traditional animation can be thoughtfully translated into a 360-degree spatial environment. The findings highlight critical considerations regarding staging, the technical difficulties of animating on a non-planar canvas, and the new cinematic language required for immersive storytelling. Most significantly, it validates the use of the 360-degree space not merely as a container for content, but as an active narrative device capable of representing complex dichotomies in a spatially intuitive manner. It allows for the navigator to physically turn

between the contrasting spaces, thereby making the environment a central narrative element.

This research highlights the need for new tools and workflows that encourage artists, animators and storytellers to experiment, embrace and adopt hand-drawn animation in the CVR context. The workflow adapted in the design process could be used as primary research in developing these tools.

This research encourages and validates the application of traditional, hand-drawn artistic approaches to emerging technologies. The unique properties of CVR encourages artists and storytellers to experiment with new possibilities for creating immersive narrative experiences that blend the timeless appeal of classical craft with the unique possibilities of Cinematic Virtual Reality.

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