

Cinévoqué: Development of a Passively Responsive Framework for Seamless Evolution of Experiences in Immersive Live-Action Movies

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ABSTRACT

Cinematic Virtual Reality's (CVR) inherent feature of allowing the user to choose their Point of View (POV) within a 360° space brings forth new challenges to storytelling. The approaches used in traditional films do not translate directly to this medium, as it is uncertain if the user would follow all the Points of Interest (POIs) consistently. Our framework, Cinévoqué, aims to address this issue by using the real-time data generated during a VR film to passively alter the narrative and parts of the experience to suit the user's viewing behavior. In this poster, we discuss the technical approaches used to implement this framework and create responsive live-action CVR.

CCS CONCEPTS

- **Human-centered computing** → **Virtual reality**; *Scenario-based design*; *User centered design*;
- **Applied computing** → **Media arts**;
- **Computing methodologies** → *Virtual reality*.

KEYWORDS

Virtual Reality, VR Cinema, Storytelling, Responsive Narrative, Presence

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1 INTRODUCTION

Cinematic Virtual Reality (CVR) immerses the viewer within a virtual environment of the movie and provides them with the ability to choose their own Point of View (POV). This feature makes it difficult to guarantee that the viewer's POV would always align with the storyteller's intended Point of Interest (POI), unlike non-immersive films, where information pertaining only to the POIs are visible in the rectangular frame. Thus, viewers may not be able to

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infer a coherent narrative in CVR if they fail to follow the intended POIs. Filmmakers and Researchers have tried to work around this issue through the use of audio and visual cues [Pillai et al. 2017; Rothe et al. 2017] to direct the viewer's attention to the intended POI. They have also utilized specific design approaches such as keeping POIs of successive scenes in a similar viewing direction to make it easier for the viewer to follow them [Brillhart 2016]. Though these approaches could help mitigate the problem to an extent, they can't warrant that all viewers would look at the intended POIs.

We propose a passively responsive framework named Cinévoqué that acts as a backend for CVR, which would dynamically alter the movie experience unbeknownst to the viewer based on POIs the user has looked at or missed, in order to show a narrative that's consistent with what they have seen. Though, to the viewer, the experience would be similar to watching a normal VR movie. As an extension to this approach, it is also possible to implement alternate storylines that are entirely different from each other, of which one would be shown to the viewer based on their gaze behaviour and without any conscious inputs from them. While the concept of branching storylines have been used in real-time games and interactive experiences, wherein the content is programmed to react based on the player's actions, the challenges in implementing this is in the context of CVR is made unique by the immutable nature of recorded or rendered videos. In the following sections, we discuss the approaches used to develop a framework that enables the creation of passively responsive experiences that account for this problem.

2 SYSTEM IMPLEMENTATION

Cinévoqué is a portmanteau of the words 'cinéma' and 'évoqué' that indicates our concept of 'evoked cinema' and it is a system built within the Unity3D game engine. The films that run on this framework are composed of *nodes*, which are snippets of the possible narrative paths. These nodes are connected in a directed graph structure and are segregated under different *levels* based on the part of the narrative they represent, i.e., nodes that depict alternate scenarios beyond a single point in the narrative are grouped under a single level. The structure of a simple Cinévoqué film is shown in Figure 1. Nodes are named after their position within the storyline, and the nomenclature is given by $L(\text{level number})N(\text{node number})$.

The decision to traverse a particular node from its alternatives is predominantly influenced by the user's passive interactions with entities called *hotspots*. They are usually associated with the intended POIs in an immersive scene, both spatially and temporally,

