

# Invasion! Exploring Empathy and Agency in VR

Eric Darnell and Michael Hutchinson  
Baobab Studios



## Abstract

Our company's first dive in VR has been quite a learning process. The technical hurdles were certainly huge, but most were easy enough to anticipate. It has been the creative hurdles were much more difficult to predict in this brand new medium. What does it mean to be immersed in a 3D world? How is a VR narrative like a movie, and how is it nothing like a movie? What happens when you play essentially the same content on two devices with very different capabilities? It all came down to just getting in there, getting our hands dirty and maintaining an open mind to what we came across along the way.

## Empathy vs. Agency

There is a great deal of buzz about the possibility of easily generating empathy in VR, but the idea of getting extra empathy for free simply because of the immersive nature of may not be so easy to achieve in practice.

Cinema does empathy extremely well despite the fact that the viewer has no control over the story, can only experience the story through a predefined "window" or screen and has no direct connection with the characters the story. In fact, the characters in the story are completely unaware of the viewer's existence.

Nevertheless, audiences find themselves drawn into this medium. They are busy projecting themselves onto the character(s) in the story. The main character becomes an avatar for the viewer. The

viewer is primed not just to sympathize with the character, but to truly feel what the character feels – to fully empathize with the character.

Putting the VR audience inside the story may actually make it more difficult to generate empathy for another character. Instead of being free to project one's self onto a character in the story (as in cinema), the viewer's focus is split. A portion of the viewer's attention is devoted to themselves. For example, the viewers may be making choices for themselves and/or for the other characters in the story. The viewer's own ego becomes a part of the process as he/she must make these decisions; that is, "What should I do now?", "What is the best choice for me to make?". This sort of viewer involvement, or agency, has the potential to make it more difficult to deeply empathize with another character. The viewer's own ego can get in the way.

One way to soften this conflict is to make the viewer and the character the same. This is what we did in *Invasion!* You are a small white bunny, and your friend is a small white bunny, too. Together you share the same experiences and face the same dangers. And victory against a shared enemy equally benefits you both.

## Who Has Control?

Much has been said about the fact that in VR the viewer can choose where to look. The implication of this being that the director must accept this loss of creative control.

This is only partially true. Even in traditional cinema the viewer has the choice to look at any part of the screen they wish – a part that may or may not include what the director wants them to look at. But if everything is done effectively, the viewer will want to look where the director wants them to look.

The same applies to VR. It is the job of the director to inspire the viewer to compose the shot that the director wants them to see. There are a number of ways to do this. A spatialized audio cue can inspire the audience to turn their head to look for the source of the sound. A character in the viewer's field of view can look at something off-screen to motivate the viewer to look, too. A lighting change whose source is off-screen can motivate a look. The sort of space that the viewer is in could encourage a certain

\*e-mail: [festivals@baobabvr.com](mailto:festivals@baobabvr.com)

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composition. For example, if you are in a living room with a window and you hear the sound of a car wreck you won't be looking under the living room coffee table for the source of the sound – you'll be looking out the window.

Then, when the viewer finds what they are looking for, the set design, lighting and other compositional elements can already be in place to help focus the viewer's attention. So the viewers, by following the proverbial "bread crumbs" laid out for them, end up finding the very composition that the director has chosen for them to discover. Of course, all of this is predicated on the viewer caring about what they are looking at. In our case, this means we must have compelling, believable characters and an engaging story. Without great story and character none of the above "tricks" matter. The viewer has to be invested.

One thing we find is that VR is so new that the viewer can be invested in the VR experience even without story or characters. Just the fact that they can look all around, that they feel like they have been transported to and are immersed in an alternate reality, can be enough. This is what we call the "Gee Whiz" phase of VR. It's the phase we are in now. Just staring up at the clouds rolling by may be enough for the newcomer to VR.

What if the viewer is missing the story because they are distracted? Ideally, you stop the story and wait for them. And while you wait, you might bring in cues to try to pull them back – a bit of audio, or a visual that the viewer is inspired to follow that eventually leads the viewer back to the narrative. So as you wait for the viewer to come back you must give up a little in terms of pacing, but this is usually better than the viewer missing a key story point and being confused for the rest of the piece. The issue of variable pacing will be mitigated by two things; 1) the viewer having more experience in the VR medium in general and, 2) by having a compelling story and characters that the audience doesn't want to ignore.

## Real Time vs. 360 Videos

We want our content to run on as many different hardware platforms as we can. Different platforms deliver different experiences and consequently require different approaches.

Higher end hardware runs at real time, rendering two stereo images every few milliseconds. The disadvantage of this is that you need a fair amount of processing power OR you need to dramatically simplify what the imagery is that you are creating. The advantage of rendering on the fly is that you can introduce content that is influenced by the viewer.

We took advantage of this when we designed for the higher end systems that track your head translation through space. For example, if you move to the side when the bunny or the aliens are looking at you, they will turn their heads to maintain eye contact. We didn't look at this as a fun feature to add to our content, we saw it as critical. If the viewer were able to force the characters to break eye contact, then the connection is lost – the immersion is compromised. So head tracking was essential.

The other thing we were able to do is to give the audience a bunny body that moves with the viewer and firmly establishes the viewer as a character in this world. This also helps with generating empathy by establishing a clear connection with the other bunny (as describe above).

Rendering on the fly gives us the opportunity to stop and start the narrative depending on what the viewer is doing. It also gives us

the chance for other mirroring events to occur. For example, if the viewer cocks his head to the side, the bunny could duplicate, or mirror, that pose, underscoring the implied connection between the viewer and the bunny.

Current portable systems like the Gear VR are not connected to powerful desktops. Most of their processing power has to come from the phone itself. Rendering something like "Invasion!" on a phone is essentially impossible. Instead we had to output our content ahead of time in order to generate a 360-degree 3D video. It looks as good as the stuff that plays on the higher end systems, but the interactivity is compromised.

Most lower end headsets don't have positional tracking, so we don't have to make adjustments to eye lines on the fly. And while other sorts of mirroring would be nice, there simply isn't the ability to add that variable content on the fly. Or, at least, not yet. As our tools get more robust and the processing power of these mobile VR devices and phones increases, there will be more opportunities to use positional tracking and real time rendering to modify the experience based on viewer interaction.

Of course, you can design specifically for the phone and allow for various types of interactivity. You just have to compromise in other areas, such as image complexity. For a project like Invasion!, which is much more focused on telling an immersive story than in providing an interactive experience, we opted to focus on high-end imagery and frame-by-frame control of character animation.

## About Invasion!

Invasion!, an animated real-time VR interactive experience, is directed by Eric Darnell, the director and writer for 4 Madagascar films and director of Antz. A teaser of Baobab's animated film, "Invasion!" is top ranked on Samsung Milk VR, a premium virtual reality content service, available via Samsung Gear VR powered by Oculus.

Eric's VR animation studio, Baobab Studios, brought together a coalition of industry experts and company advisors to aid in Invasion's creation: animation innovator Glen Keane ("The Little Mermaid," "Tangled"); DreamWorks Animation Co-President Mireille Soria; David Anderman, Chief Business Officer of Jaunt and former Lucasfilm COO; Pixar Animation Studios co-founder and alpha channel co-inventor Alvy Ray Smith; Pacific Data Image co-founder and former DreamWorks Interactive CEO Glenn Entis; and Twitch co-founder and COO Kevin Lin.

"Invasion!" is the story of advanced aliens as they arrive on Earth to claim it as their own -- and destroy anything that tries to stop them. However, despite the Aliens' vast intellect, superior technology and horrific firepower, the citizens of Earth rise up and, against all odds, bravely square off against these ruthless invaders. But these citizens of Earth are not members of the human race, as might be expected. Instead, they are two of the cutest, sweetest, cuddliest and meekest creatures of our planet, creatures that easily perish -- two adorable little white bunnies.