A Guide to Immersive Ethics

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About the Authors

Jayson Chesler is a digital storytelling producer for McClatchy, where he works on maps, 3D assets and other web visuals for enterprise stories. He has developed workflows for AR storytelling and photogrammetry for use in work like McClatchy's collaboration with Yahoo News XR and the nonfiction AR app Actual Reality.

Theresa Poulson is a product manager for news, building audience-focused strategies for new and existing products for McClatchy. Based at New Ventures Lab, she has guided journalists in creating content with emerging media including 3D and augmented reality. She was an executive producer for Actual Reality, a McClatchy app dedicated to serialized AR storytelling, which won a 2019 OJA for Excellence and Innovation in Visual Digital Storytelling, Medium Newsroom.

Journalism 360 is a global network of storytellers accelerating the understanding and production of immersive journalism. Our mission is to help news organizations, journalists, technologists, content creators and journalism educators experiment with all forms of immersive storytelling, including but not limited to 360 video, augmented reality, virtual reality and mixed reality.

Introduction

As media evolves, journalists are presented with new opportunities for storytelling; re-thinking what defines "ethical storytelling" in new and powerful media is part of that process.

No, not throwing out the rules — instead, being thoughtful about how we interpret the standards of our industry as they apply to emerging methods and technology, and understanding the potential implications of our actions.

This guide is meant for those who are looking for a way into the discussion about ethical storytelling in emerging tech and for those who've already made headway and want to compare notes.

Immersive media (including 360 video, augmented reality, virtual reality, and other 3D experiences) presents several key differences from traditional media that demand a re-translation of long-held ethical standards:

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- The audience has more agency and control.
- The experiences and how they're presented are often new to audiences and sources.
- The perception of immersive and psychological impacts are still being discovered.
- Capture techniques require more post-production work (repair/rebuilding and optimization) in post-production than photo or video.
- There are very real challenges, limits and flaws to the technology (for the user experience and creators).
- The aesthetic can be more evocative of a video game than a homepage.

The goal of this guide is to provide resources and recent use cases, with the acknowledgment that this space is changing rapidly and new considerations come to light every day.

Thinking Critically About Ethics

Here are some questions you may consider as you embark on a new immersive project. These questions are not meant to stifle exploration, rather to inspire careful consideration of the potential effects of how we're reporting, producing, and delivering our story to audiences.

Production

☐ Can the subject be captured, or will a recreation be more accurate?

☐ Will a failed capture distort the truth? Photogrammetry software, for example, is accurate if the inputs are accurate, but is there a risk of photos being incomplete, over-exposed or lacking visual details?

☐ Is the exact subject needed for the story? Can the asset be representative of the subject? Can the subject be modeled faithfully?

☐ If capture isn't possible, is modeling from photos viable?

☐ How will people be captured and how might that affect how they are perceived?

☐ What tools will be appropriate for capturing people?

☐ Is the presentation style of volumetric video distracting? Is it a problem if only the front of the subject is captured?

☐ Will the stillness of a photogrammetry capture be too lifeless or unsettling? Will clothes or hair be misrepresented by photogrammetry?

☐ Is motion capture possible? If not, will stock motions not recorded from your subject distort the truth?

☐ Could your approach for capturing people inadvertently dehumanize them, present them as an "other," portray them as a villain, or accentuate or diminish features in a way that could appear like a caricature?

☐ How will you talk with your sources to gain informed consent?

☐ Are they aware of what the capture will entail?

☐ Do they understand how and where their likeness may appear, and what users could do with that asset?

☐ Should you ask them to sign a release that outlines all of the above?

☐ How will places and spaces be captured?

☐ How will you work with property owners to gain permission?

☐ Does providing an immersive view of a space present a security risk?

☐ What will be your approach for objects?

☐ What are the important details of an object, and can you capture and represent objects accurately?

☐ If the context of an object is important to the story, can you accurately capture and represent it?

Designing experiences

☐ Will the design provide for enough context needed to tell the story?

☐ Do you need to disclose anything in an editor's note or warn about sensitive content? Where should those notes be placed? And what kind of language should you use?

☐ Does the design take into account one's physical safety and awareness of one's surroundings?

☐ How do you onboard users into the experience?

☐ Is there a way to contact creators?

☐ Is there an opportunity to show the audience how you created the experience?

Testing experiences

☐ What is the user's perception of the purpose of the story?

☐ Do they trust what they see?

☐ What questions do they have?

☐ Is it clear what action they need to take? If not, do they miss any critical parts of the story by not taking that action?

☐ Does the story hold up from different points of view, and fields of view? On different devices?

Controversial and sensitive topics

☐ Could viewing your experience be traumatic for viewers? How might you account for this in your editorial decision-making?

☐ If a story is presented in AR, are you comfortable with viewers placing the story in any environment and taking photos? How might you guard against recontextualizing?

☐ Like a statue, could creating a 3D scan leave the impression that the object or scene represented is something to be memorialized or honored? How might you account for that in its presentation?

Distribution

☐ If your first line of distribution is available on limited devices or platforms, can you make adaptations to make it more accessible to other audiences? ■

Case Study: Actual Reality

At McClatchy, we built our own ethics code for our AR app, [Actual Reality](#), while we were early in pre-production for the content. Creating stories in AR was a first for our organization, so we wanted to set some ground rules before getting started. What follows is a slightly abridged version of the editor's note that appears in the "about" section of our app. The note was crafted in collaboration with our entire team and put into writing by the executive producers, Ben Connors, Theresa Poulson and Meghan Sims.

The Editor's Note

Our AR stories use a variety of 3D media, including photo-realistic models, recreations and illustrations. The production processes are new to nonfiction storytelling. Maintaining your trust in our journalism is of the utmost importance to us, so we will be transparent about how and why we produce the 3D images you see in this app, including clearly noting instances where there might be confusion.

Photo-realistic models

The photo-real, 3D models of people, places and objects are created using a process called photogrammetry, which combines hundreds of photographs taken from many angles.

Due to the nature of the technology, many of these models are edited for technical and visual clarity. We follow these guidelines when editing those objects:

To maintain faithful representations of people, places or objects, some of the visual information that was lost or damaged in the production process has been reconstructed by replicating the texture and shape of the original object.

When a photo-real, 3D object cannot be reconstructed, we might use an artist's recreation in its place. We have done this only if:

1) The object is integral to the story,

2) Using a recreation is the only option for representing the object in the story and

3) The recreation is as faithful to the original object as possible.

Any time we've used a highly realistic artist's recreation to take the place of an object, it is noted at the beginning of the story you're viewing.

Photo-realistic scenes through recombination

When a scene contains different types of 3D models, particularly models that move, it is often necessary to scan different components of the scene in isolation (separated either in time, location or both) and then recombine them to produce a single, cohesive scene.

For instance, we might spend 20 minutes capturing a 3D model of a street corner, then afterward ask a character to step into a different area where

we can most effectively create a model of their body. Then we'd recombine those elements to create one scene.

When we use recombination to create a scene, we endeavor to recreate the scene with as much fidelity as possible making sure that:

1) The scale of the components match,

2) Any actions represented are authentic to the characters and the spaces they are in, and

3) No objects of editorial significance are omitted.

At times, we will create recombinations that are not intended to represent actual environments, such as when we show how objects compare or show several objects as a gallery. These instances will be clearly noted in the editor's notes for that story.

Motion capture

In some cases we have added movement to photo-realistic, 3D people through a process called motion capture, to provide lifelike representations of the sources in our stories. To do this, we:

1) Record motion data with a portable sensor,

2) Take hundreds of photographs from many angles (photogrammetry) and

3) Combine them in software to create a moving, 3D model.

As we experiment with this new technology, we aren't always successful at capturing the real motion data, so we might use animation from a stock library to add movement to a person instead. Any time we do this, it is noted at the beginning of the story you're viewing.

Volumetric video

In some cases we've presented characters using a technology called volumetric video. We use a tool called DepthKit, which combines frames from two different types of video cameras. One camera records normal color videos and the other records a low-resolution "depth" video that captures the shape of the character in 3D.

Although you can move around these videos and view them from multiple angles, you might notice that the edges of the characters look warped from certain perspectives. To mitigate the effect, we've slightly altered the brightness of the color video with information from the depth video. You'll be able to see the depth video overlaid as a series of light lines and dots. The resulting image looks a little like an animated topographic map.
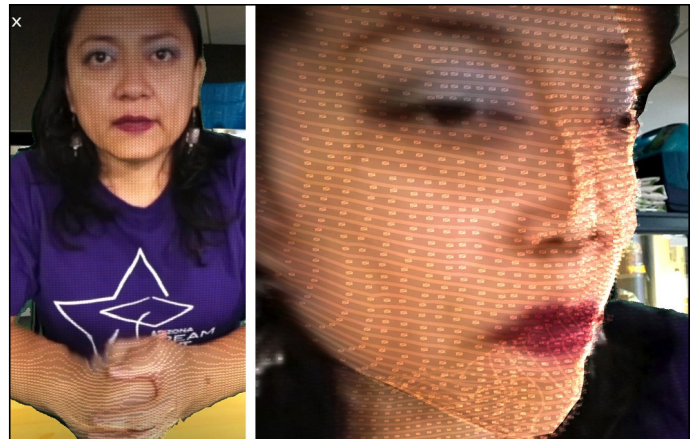
Illustrations

You'll also see different kinds of artists' illustrations throughout this app.

The illustrations are used for a variety of reasons: to create a sense of space, to recreate a memory, when a realistic reconstruction wasn't possible (either due to lack of access and/or privacy concerns), to contextualize or add to a realistic 3D object, to visualize data or represent a concept.

These illustrations should be easy to differentiate from the realistic, photogrammetric objects. But we'll err on the side of caution: Any time we think there might be a reason to clarify or add context to what you're seeing, we'll let you know in a note at the beginning of the story you're viewing.

Build Your Own Guide

Some things to consider when making your own guide:

- **Reference precedent:** Consider your organizations' rules for photography, graphics, video and design.

- **Dialogue across disciplines:** Immersive media requires significant contributions from talent with diverse professional backgrounds. Include all contributors in conversations about your journalistic standards, not just the ones who traditionally get the bylines.

- **Practice transparency:** Emphasize why you are using this technique (doesn't have to be explicit). Provide explanations for your audience for those who want it. Choose language carefully. Who are you talking to and why?

- **Embrace imperfections:** Shortcomings in technology and the "rough edges" that come with experimentation shouldn't hold you back. ■

Case Study: American Food Post-Production

American Food, McClatchy's AR tour of cultural food enclaves around the United States, centers on the iconic dishes on local restaurant menus.

In post-production

The producers had returned from the field after capturing an array of Vietnamese food from Sacramento's Little Saigon using photogrammetry. Complex light information from shiny and transparent surfaces confuses the photogrammetry software (in this case, we're using RealityCapture), leaving holes in our 3D images. What's more, this bowl was white, providing no textural detail for the software to use to connect the images into a complete model.

The first step should always be to reshoot, if possible. But with such a challenging subject, and little time for a reshoot, we were faced with a decision: We can either leave the rough spots or make edits to ensure that the surfaces are as faithful to the original as possible.

For guidance, we looked at industry precedent for visual media, in particular these two rules:

"Editing should maintain the integrity of the photographic images' content and context. Do not manipulate images or add or alter sound in any way that can mislead viewers or misrepresent subjects."

— NPPA

"When reporting on news events, the photographs we take and use depict them truthfully, honestly and without bias. They are only enhanced for technical clarity — to correct color or improve contrast, for example. We are careful in how we crop them to ensure that the scene is in proper context."

— NPR's Visual Ethics Code

For 2D photos, this means limiting edits to modifications like adjusting exposure in the darkroom or color correction in Photoshop. Editors shouldn't take liberties to add Instagram-like filters that might suggest the photo was taken at a different time of day, or go even further by removing or adding elements in a scene.

With this spirit in mind, we came up with this policy for editing 3D images:

Captured objects may be edited for technical and visual clarity if the edits are as faithfully representative as possible.

So what does this mean when it's put into practice? Since photogrammetry requires lots of photos, we had a ton of visual information to reference as

we edited the chewed-up dishes, like this one of Vietnamese soup, for visual clarity. We looked closely at the photographs and used a digital sculptor's toolkit -- "digital clay" in the 3D sculpting software ZBrush -- to fill in the missing parts of the shape.

Then, to get the color and texture right, we used a combination of the clone stamp tool and hard and soft brushes in Photoshop to copy the surface from a photograph.
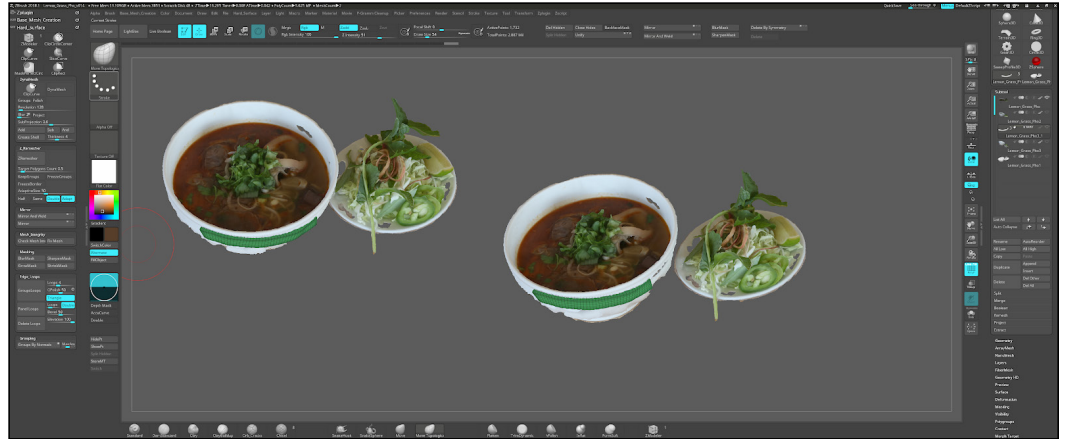

With those two techniques working together (within a limited time frame), the final image is as faithfully representative as possible.

In an effort to be transparent, we run an editor's note in our app explaining the edits and defining this type of object as a "photo-realistic model."

The Glass Bowl

Another test of our ethics code came up when we wanted to feature a model of the dessert dish bouza in the episode taking viewers to Little Arabia in Anaheim, Calif.

In this case, the area's iconic stretchy "ice cream" was served in a glass bowl, and the model of the dish had more than a few small holes:
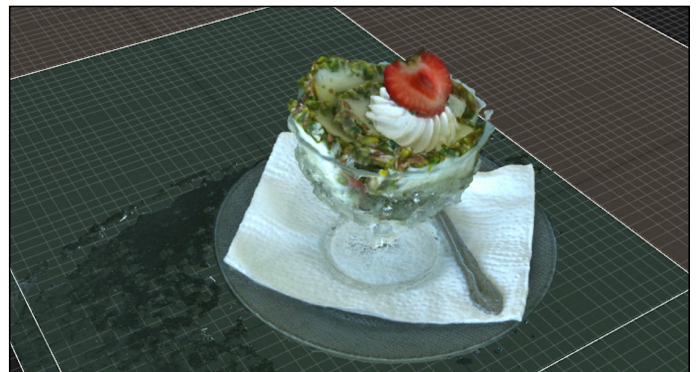
To fix this, we would have to build the bowl from scratch referencing the original scan that had information on the circumference and photographs

of the surface's texture. Then, we put the photogrammetric model of the bouza inside the re-creation of the glass bowl.

While getting as close to the original object as possible was still the goal, we think this goes beyond simply editing for technical and visual clarity. We also know it's important to give ourselves limits to how and when to use a realistic re-creation, so we included an editor's note at the beginning of the episode. ■
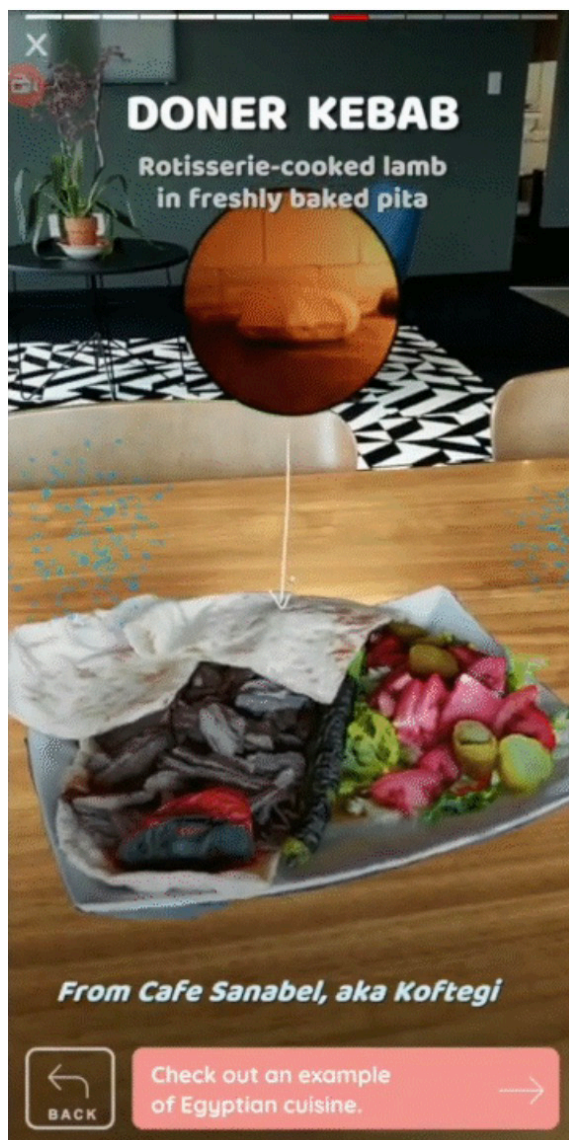
Case Study: Euronews 360 Video

Euronews has produced dozens of 360 video projects in recent years, with [Thomas Seymat](#) heading their immersive workflow.

For this project, [Deadly wildfires: a devastating year for Portugal](#), Seymat served as executive producer to tell the story of a devastating year of wildfires in Portugal. The piece mixes 360 video, traditional video and a spatialized audio mix with natural sound, music and interviews translated from Portugese to English.

In the Field

Euronews' history of creating video journalism for TV long outdates their 360 projects, which allows Seymat to pull from existing standards for a lot

of potential ethics questions. The team avoids staging actions with their subjects and tries to capture what would be going on if a camera weren't there as opposed to influencing what's happening, just like in their TV work.

Similarly, the sound engineer mixed the spatial audio to accurately portray the sounds that were actually present. While the engineer wasn't in the field during production, the producer who was there understood how to best work with the ambisonic microphone they used for spatial audio capture, which meant that audio captured was directionally consistent and easier to maintain accuracy with.

The larger point of difference between Euro-vision's 360 production and traditional video is, obviously, the camera. Since a 360 camera films all around it, Seymat said those in the field explained -- in Portugese -- to those around the camera that it could film them wherever they are.

Knowing the technical limitations of the specific camera in-use made this an easier task: the video was shot with a Samsung Gear 360, so the team knew that people wouldn't be identifiable if they were farther than about 25 feet from the camera, Seymat said.

In Post-Production

Euronews generally doesn't edit tripods out of their 360 video, Seymat said. This is done, in part, to save time, but it also avoids difficult technical and ethical complications.
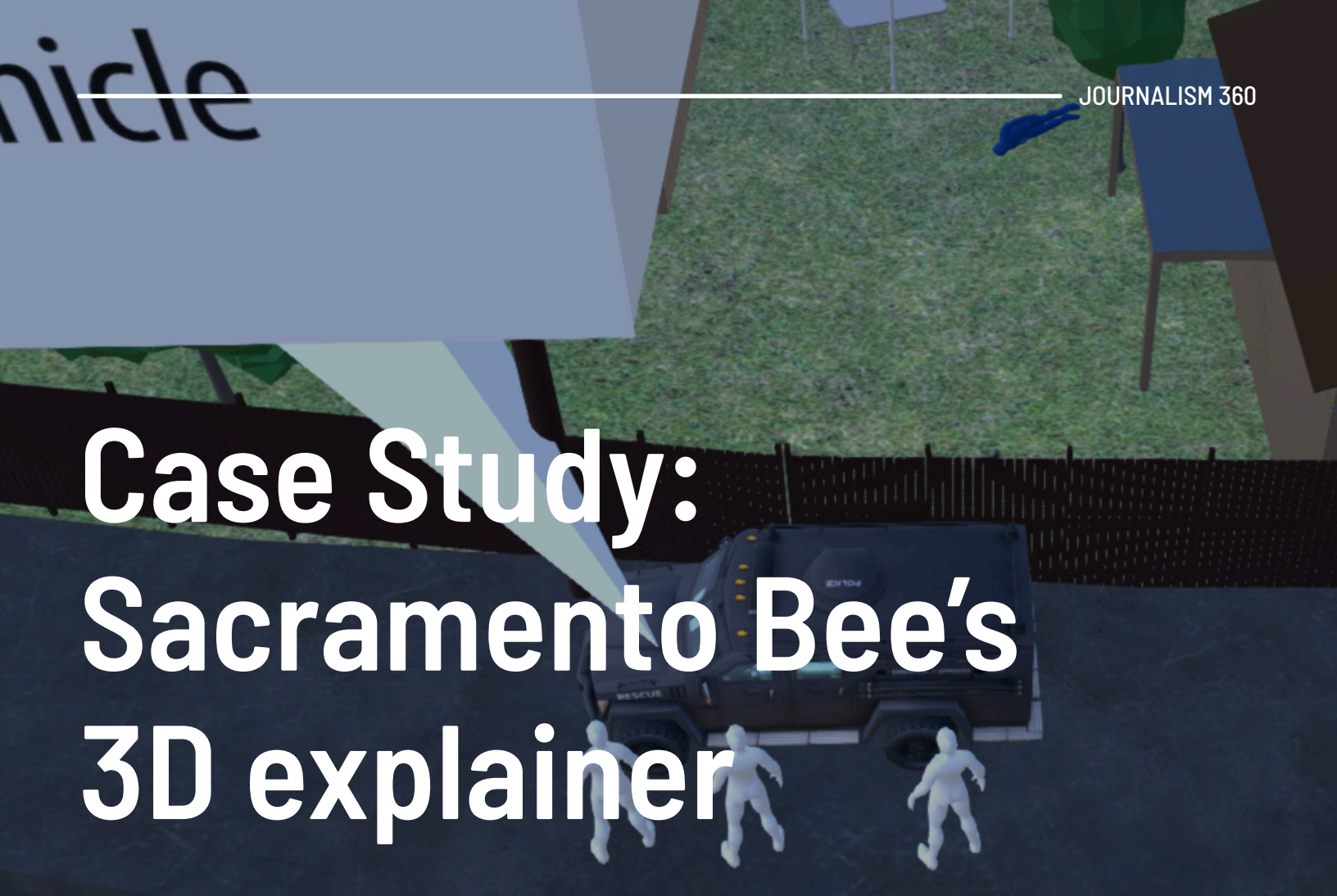
This project features various textured nadirs -- like cobblestone and straw -- that would have been challenging to replicate with visual editing tools. And the team in the field is small so as to not interfere with the subjects they're filming, so taking photos of every nadir would be challenging too.

Instead, Euronews chooses low footprint light stand-style tripods instead of bulkier ones used for traditional video cameras. These tripods are left in the shot rather than being removed or covered with a graphic, which gives the viewer full transparency that they're seeing the full picture. Since they're relatively small, the tripods don't interfere much with the overall visuals of the project.

Avoiding traumatizing experiences in VR

While Seymat said the main audience considered for Euronews' 360 projects is web viewers, the general policies they follow are appropriate for those who use VR headsets as well. Euronews' TV stories cannot contain violence and graphic imagery, and they follow the same guidelines for their 360 work.

Through experimentation, the team has found ways to do relatively steady moving shots with the 360 camera. In the case of this project, they use car mounts for movement, which keeps the footage smoother than if someone had been walking with the camera instead. While this makes for an overall better viewing experience in general, it's particularly vital for anyone watching in a headset to avoid feeling ill. ■

Case Study: Sacramento Bee's 3D explainer

The team working at McClatchy New Ventures Lab collaborated with The Sacramento Bee to produce a 3D animated explainer about the shooting death of Sacramento Police Department Officer Tara O'Sullivan.

This piece features 3D assets modeled by David Martinez, police scanner audio from the scene and 3D callout boxes with contextual information with fact-checking by Melanie Hogue. Jayson Chesler brought it all together as the producer.

A 3D animation approach was taken to answer one fundamental question about the scene: why did it take officers 47 minutes to rescue Officer O'Sullivan? Since the public had confusion about what exactly had happened and limited access through reporters to the environment itself, a 3D representation seemed like an appropriate way to show the events accurately.

Sourcing Visuals

Since the area represented in the piece was a crime scene in a residential area, we were unable to physically visit the site. Instead, the visuals were created using a mix of drone footage, Google Maps imagery and bodycam footage for references.

The Sac Bee's Daniel Kim filmed drone footage the week after the shooting and made it available for the NVL team to work with. This footage was cross-referenced with imagery from Google Maps, which was more complete but was somewhat out-dated. Any areas that had changed since Google Maps' last update were paid extra attention, since they were less easily fact checked with a quick look at the map.
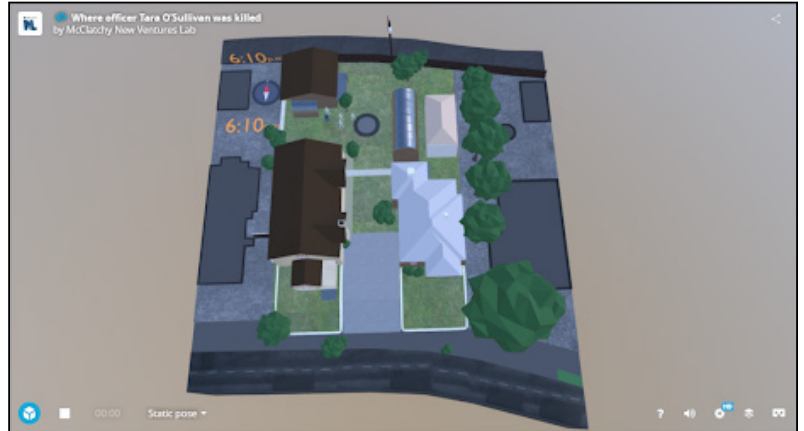
Finally, some specific areas of particular importance appeared on bodycam footage released by the police department. This footage was used to fine-tune a few particular details, including a taller-than-expected, overturned trampoline and the distance between some of the structures in the backyard.

Only Showing Known Truth

There were a lot of unknowns within this story that had to be accounted for in the final product. Police officials gave a detailed rundown of every time the suspect fired his gun during the standoff, but did not clarify where he was located while shooting. Similarly, the scanner audio mentioned multiple times that officers were concerned that the suspect had access to multiple houses, sheds and other structures and weren't certain where he was. As such, the visualization doesn't attempt to show where shots are being fired from, and instead a "shots fired" graphic flashes across the entire scene.

A similar combination of official statements and scanner audio gave a general picture of where officers were positioned during the event. However, the path the police took from position to position was not demonstrated, and was particularly difficult to figure out given the confusing layout of the backyard and surrounding area. The only bodycam footage released showed the moments after the initial shots were fired, when officers retreated from their initial positions.

Since there were too many variables and not enough information to know for certain how the police officers and vehicles got from each position that they described in the scanner audio, the piece does not tween from one position to the next. Instead, the recreation serves as more of a 3D audio slideshow than a video with interpolation between frames, which also saved time during production.

Lastly, the visual style of the piece was meant to show a certain level of overall uncertainty. While a photogrammetry capture of the crime scene was never a viable option, a 3D artist could make a more realistic depiction of the environment. Rather than focusing attention on trying to get every inch of real estate correct and photorealistic, a more blueprint-esque style was chosen so the team could work quickly -- before the news cycle had passed -- and so the team could focus their efforts on fact-checking events and not just visual details.

Representing Time and Space

The events shown take place over 47 minutes, but the visualization only lasts for five. Like in traditional video or audio reporting, the team cut large portions of scanner audio to better and more efficiently tell the story. To show the passage of time, the team placed a clock graphic in the top left corner of the visualization.

The events that play out, the audio on the scanner and the shots fired graphics are all synchronized with the times shown. ∎

Additional Resources

🔗 [Ethics in AR Discussion at ONA 2019](#)

🔗 [After Volcano Eruption in Guatemala, Re-creating a Truck Covered in Ash](#)

🔗 [Thoughts on Media: The Ethics of Virtual Reality Storytelling](#)

🔗 [Responsible Reconstructions Using Virtual Reality to Expand the Possibilities of Documentary](#)

🔗 [An Ethical Reality Check for Virtual Reality Journalism](#)

🔗 [NPR Ethics Handbook: Visual Journalism](#)

🔗 [SPJ Code of Ethics](#)

🔗 [NPPA Code of Ethics](#)

🔗 [ONA: Build Your Own Ethics Code](#)