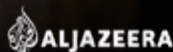


An Introductory Guide

PRODUCING STORIES USING 360-DEGREE VIDEO



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At a time when viewers are keener than ever to delve deeply into news stories and when they want to interact more closely with their characters and details, traditional media can no longer satisfy. We need a new technique, one that frees the viewer from the cameraman's control of the scene - 'framing' in both the technical and theoretical senses - and allows the audience to decide what angle to take.

The 360-degree technique frees us from the limitations imposed by a traditional camera, which includes some visual elements while excluding others. It places the camera in the viewer's hands, allowing them to choose their own angle as the story is told visually.

In this handbook we provide a timeline summarising the most important stages in the production of stories filmed in 360 degrees. We have also included some advice from our AJ Contrast experts, drawing on their long and multi-award-winning experience with 360-degree film.

Al Jazeera Media Institute



Introduction

In her book *The Pains of Others*, the American journalist Susan Sontag highlights the moral dilemma of consuming images of pain, noting that there is always someone behind the camera deciding what should be in the frame and what should be left outside it. In the 20th century, images were first used as a means of transmitting objective information and presenting a 'factual' version of events in faraway places.

But visual journalism has since developed steadily, along with two parallel technological developments : the digital and the computational.¹



1. Talar Kilijian, *Virtual Reality Journalism*, *Columbia Journalism Review* (accessed on 17 March 2019 at) <https://medium.com/journalism-trends-technologies/from-360-to-virtual-reality-e20aa5f5b96d>

According to the theory of communicative needs, the audience can determine its own aims and needs and likewise, its motivations for accessing media.

The audience, then, has the power to choose the content and media that meet those needs. Media richness theory says that the task of media institutions is to overcome the communication challenges that confront the audience, such as unclear messages or messages with contradictory interpretations: 'The more learning that can be pumped through a medium, the richer the medium.' This is where technology comes in.

Technology allows humans to meet their developing need for information, and to decode ambiguous symbols through pictures and sounds set up by a computer. Their role, however, was limited to that of a spectator until the emergence of virtual reality.

Virtual reality has given spectators access to a virtual environment that enables them to be agents outside the control of the cameraman.

The possibilities presented by VR-enabled 'immersive journalism' were first demonstrated in 2010 by the VR pioneer, Nonny de la Peña. De la Peña showed how it was possible to allow the audience to access stories, to discover 'the sights and sounds, and possibly, the feelings and emotions

that accompany the news' by producing a story about starvation in Los Angeles. In just a few years, those early experiments moved from labs to newsrooms.

This was possible thanks to two technological advances: cameras capable of filming a -360degree scene in 3D, and a new generation of headphones. The latter allowed Palmer Lucky, founder of Oculus VR, to produce the first VR headset in the early 2010s.

When the Google Daydream VR platform launched in the UK and USA in November 2016, the Washington Post used it to retell the story of Freddie Gray, an African American man who was put into a coma in police custody and subsequently died.

The newspaper used visual, audio and text materials, and 3D maps, drawing on court records and witness testimony to allow the viewer to feel the pain and gravity of the crime more actively and powerfully than they would have through the traditional, textual narrative. In similar fashion, the New York Times told the story of NASA astronauts training in the Mauna Loa volcano (an environment resembling that of Mars) in Hawaii.

The Google Store soon included apps associated with many major news outlets: CNN, USA Today, The Guardian, and the BBC. This was a moment of transformation for VR in news.

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360-degree and VR journalism have spread rapidly in the coverage of humanitarian crises and wars in particular. In 2015, the Innovation and Development Department at the Al Jazeera Network began working on producing 360-degree film and VR content, which resulted in the creation of the Al Jazeera Contrast Studio.

AJ Contrast specialises in telling stories from marginalized communities and the Global

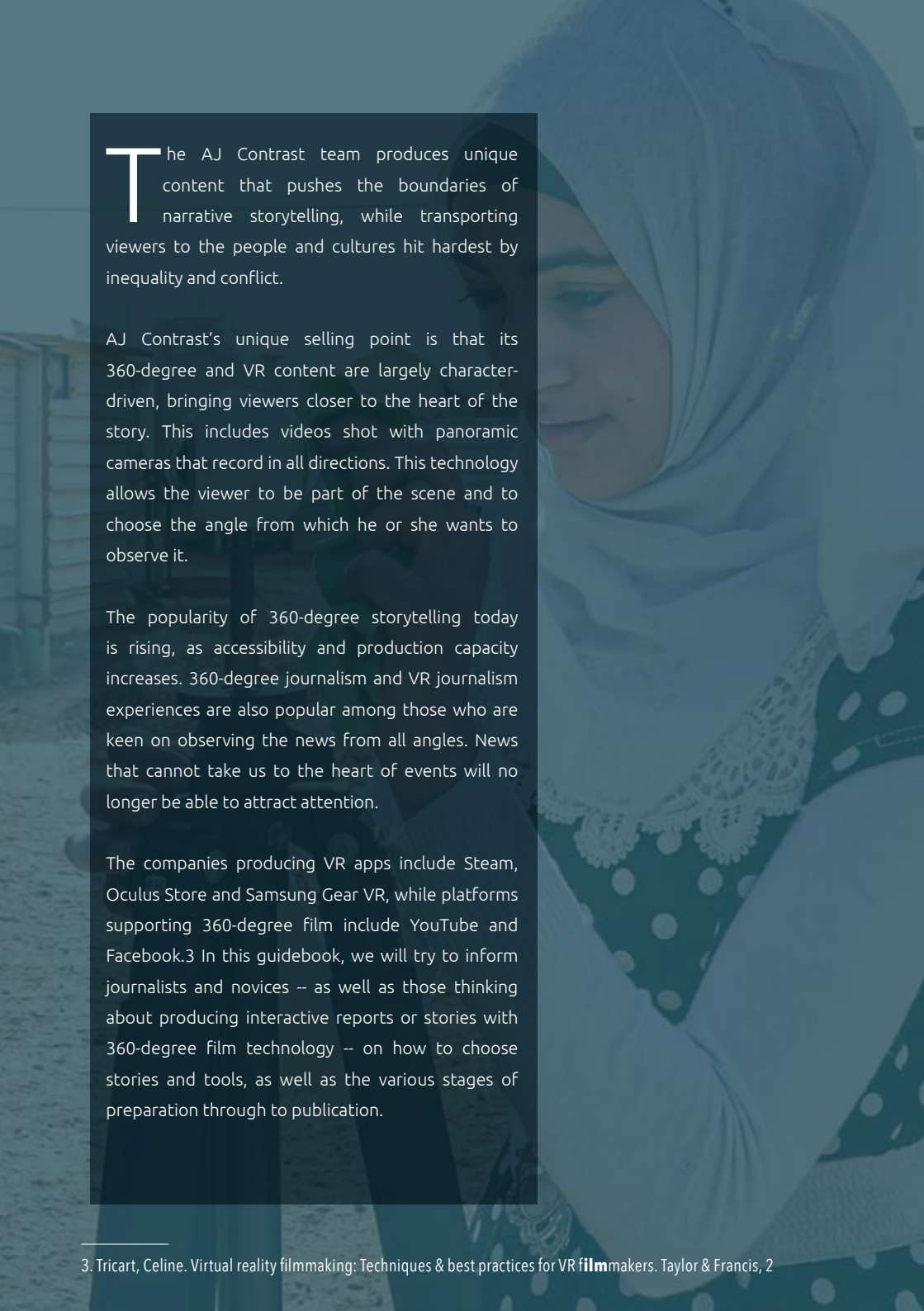
South, using emerging technologies, such as virtual or augmented reality.

The team began to produce stories from around the world and publish them on Al Jazeera's media platforms in English.

In 2018, they began translating their work into Arabic and publishing it on Al Jazeera's Arabic platforms, which became the first Arabic-language media outlets specialising in VR news.

The AJ Contrast team produces unique content that pushes the boundaries of narrative storytelling while transporting viewers to the people and cultures hit hardest by inequality and conflict.





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AJ Contrast's unique selling point is that its 360-degree and VR content are largely character-driven, bringing viewers closer to the heart of the story. This includes videos shot with panoramic cameras that record in all directions. This technology allows the viewer to be part of the scene and to choose the angle from which he or she wants to observe it.

The popularity of 360-degree storytelling today is rising, as accessibility and production capacity increases. 360-degree journalism and VR journalism experiences are also popular among those who are keen on observing the news from all angles. News that cannot take us to the heart of events will no longer be able to attract attention.

The companies producing VR apps include Steam, Oculus Store and Samsung Gear VR, while platforms supporting 360-degree film include YouTube and Facebook.³ In this guidebook, we will try to inform journalists and novices -- as well as those thinking about producing interactive reports or stories with 360-degree film technology -- on how to choose stories and tools, as well as the various stages of preparation through to publication.

Why use VR or 360-degree video?

*Before you begin a VR project,
you should ask yourself the following questions:*

- Does using VR strengthen the story? How
- Does the viewer need to experience the story (physically)



*If the answer is yes
VR may be your best bet.*

In recent years, the use of VR in journalism has become more popular, because it allows viewers to step inside a scene they might never encounter in their daily lives. When viewers are able to tour a refugee camp themselves -- rather than just seeing it on a screen -- they will likely understand and connect with the refugee crisis on a deeper level.

The objective of VR and 360-degree storytelling is to create a link between the audience and the people and cultures whose stories are being told in this new narrative style.

A step-by-step guide to making a 360-degree video

Step 1: Understanding the technology

What is the difference between VR and 360-degree videos?

Though they can be used together, there are some important differences between 360-degree videos and VR:

When watching a 360-degree video, the viewer can only look up, down, left or right as well as straight ahead. A VR experience, meanwhile, is almost unlimited: in VR, you can control and interact with your environment.

To understand 360-degree video, imagine that you are in the passenger seat of a car. The director is the driver: he or she will create the experience, directing the car from the beginning of the journey until its end. You observe from your seat and enjoy the sights without direct involvement.

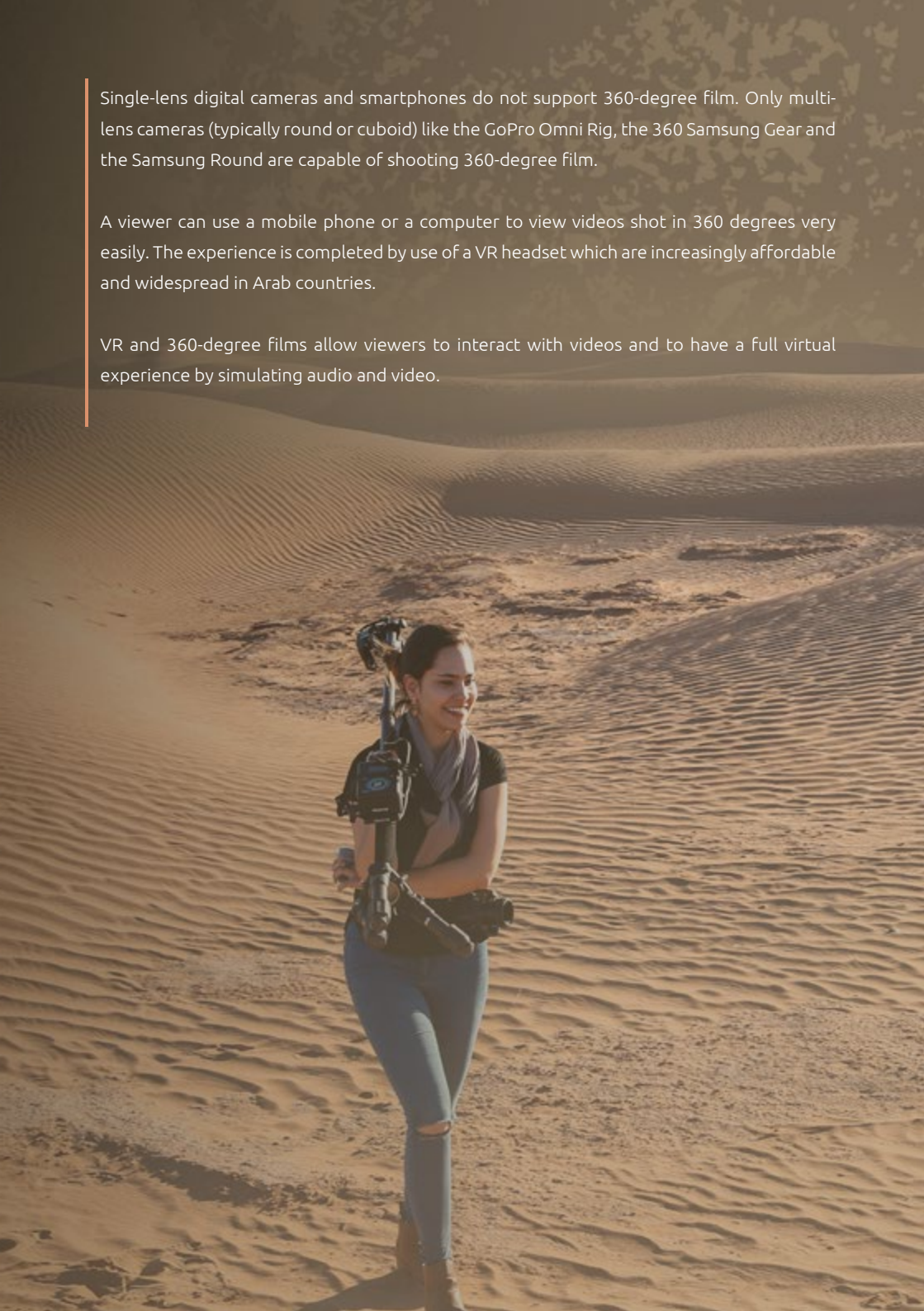
With VR, you are behind the steering wheel and you decide where you want to go. This is what makes VR such an attractive choice for video game designers and modellers (Vimeo).

360-degree film includes videos shot with panoramic cameras that record in all directions. This technology allows the viewer to be part of the scene and to choose the angle from which he or she wants to observe it.

Single-lens digital cameras and smartphones do not support 360-degree film. Only multi-lens cameras (typically round or cuboid) like the GoPro Omni Rig, the 360 Samsung Gear and the Samsung Round are capable of shooting 360-degree film.

A viewer can use a mobile phone or a computer to view videos shot in 360 degrees very easily. The experience is completed by use of a VR headset which are increasingly affordable and widespread in Arab countries.

VR and 360-degree films allow viewers to interact with videos and to have a full virtual experience by simulating audio and video.



Step 2: Choosing a story

Not all stories suit the use of this technique. There are several criteria that help us decide whether a story will be better told using 360-degree film.

Character:

Rather than telling the audience about the story, find a way of framing it through a narrative based on a character. Find a compelling character and allow them to gradually take you into their world, making sure not to intervene in their performance. You should only intervene for technical reasons -- for example, to request that someone do something in a particular moment in order to capture it on film.

'Different media organisations have different approaches to 360-degree filming, but AJ Contrast believes that the character affects the story. We always strive to find a way of covering issues through the eyes of those most affected by them.'

Location:

The environment should be interesting enough that the viewer can explore it. This is why much VR coverage of news stories focuses on places in the developing world or conflict zones – not only in pursuit of richer images, but also because it takes viewers to a world that would be difficult to access. However, we should be careful not to focus more on the location, rather than the story itself.

For example, while shooting *I Am Rohingya*,⁴ AJ Contrast told a story that is not just about the experience of being in a refugee camp, but about one refugee's life there. Rather than simply placing a 360 camera in the camp, AJ Contrast created the story around Jamalida, a mother, widow and refugee who experienced terrible things, but also has a strong spirit. The story centred around her reality and the things she does every day. For example, we see Jamalida bathe her children and prepare their food.

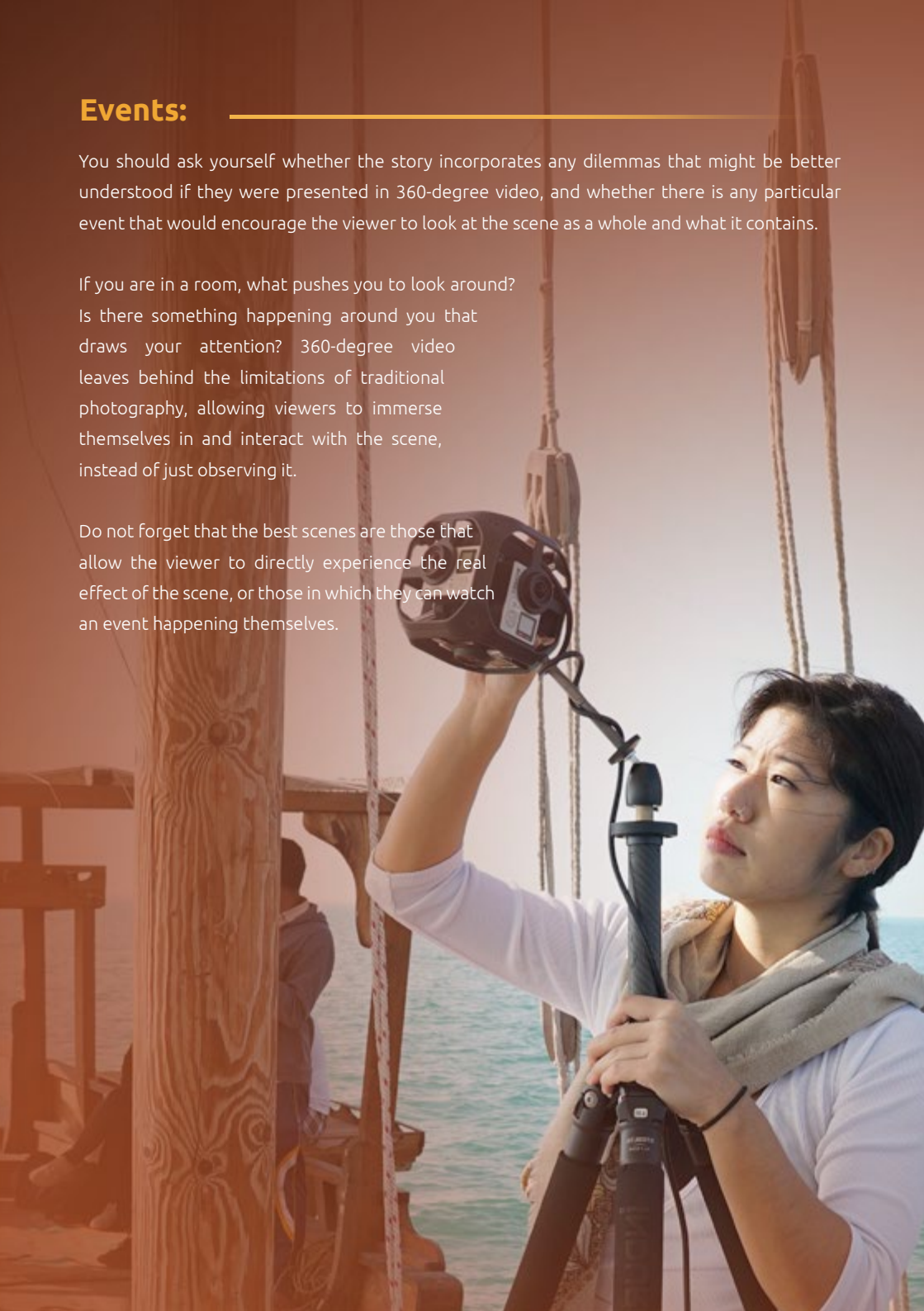
4. <https://rohingaya.com/ajcontrast>

Events:

You should ask yourself whether the story incorporates any dilemmas that might be better understood if they were presented in 360-degree video, and whether there is any particular event that would encourage the viewer to look at the scene as a whole and what it contains.

If you are in a room, what pushes you to look around? Is there something happening around you that draws your attention? 360-degree video leaves behind the limitations of traditional photography, allowing viewers to immerse themselves in and interact with the scene, instead of just observing it.

Do not forget that the best scenes are those that allow the viewer to directly experience the real effect of the scene, or those in which they can watch an event happening themselves.



Step 3: Preparing equipment

It's important to carefully plan your day(s) with regard to team size, filming dates and equipment. In the next section, AJ Contrast outlines their workflow and 'go-to' regarding planning and equipment.

360-degree camera:

Our go-to camera is the GoPro Omni, although the team has also used the Nokia Ozo (I Am Rohingya,⁵ Oil In Our Creeks⁶) and the Samsung Round (Dreaming in Zaatari,⁷ We Shall Have Peace).⁸

A piece of advice: We usually bring a second GoPro Omni with us when filming because experience has shown us that the Omni can have problems when filming or even stop working, particularly in difficult environments. It's always best to have a back-up camera.

A non-360-degree video:

We always try to film a few segments using a Sony A7sii with an FE 24-70mm f/2.8 GM.

Alongside cameras that support 360-degree film, we always bring a DSLR camera to take pictures and film behind-the-scenes footage. Sometimes we take pictures with our phones, but we always need high-quality photos to use in our posters and publications on social media and elsewhere.

For these purposes, we use a Sony A7sii with an FE 24-70mm f/2.8 GM.

5. <https://ajcontrast.com/rohingya>

6. <https://ajcontrast.com/oilinourcreeks>

7. <https://ajcontrast.com/ofilm-zaatari-in-dreaming>

8. <https://ajcontrast.com/sudan-south>

What to use with a GoPro Omni:



Battery pack:

Whenever possible, we have our camera plugged into our external battery. This lessens the chance for the camera to glitch, and keeps it running longer.



Two extenders:

These two little silver rods connected to the camera are super important. We use them to create additional space between the 360 camera and the tripod mount, which will decrease how much visual space the tripod will take up on the footage. This will make a world of difference in post-production when we are masking out the tripod.



Ball-head tripod mount:

Having one particularly helps when you are filming with a subject. This allows us to adjust the GoPro Omni so that we can make sure a lens is directly facing the subject head-on, and avoid unnecessary stitch lines across the subject's face or body.



360 Samsung Gear camera:

We always bring a Samsung Gear along because we sometimes need a camera that is lighter and smaller than the GoPro. Depending on whether we will need them, we also bring a spare one. We've used them in varying ways across different docs, although the quality of the camera is much lower than the GoPro Omni rig. They're also particularly useful in more tricky situations, where you take a risk that the camera will get damaged. We've used a Gear 360 for Pearls of the Past⁹ (caged inside a waterproof case), for the drone shot in Forced To Flee, and for our Macedonian documentary Winter, Leave.

9. <https://ajcontrast.com/qatar>



Tripod:

- ▶ The basic compact carbon tripod.
- ▶ If we need to get location b-roll shots (like the shot in *The Disappearing Oasis*¹⁰), we'll use a monopod that can get the GoPro omni rig as high as 180cm. The monopod also allows for extremely easy tripod-removal, appearing as a smaller dot at the bottom of the footage, as opposed to a taking up a large chunk of the lower half of the screen.
- ▶ For other handy mounts for creative shots, we'll use a car mount (like our opening scene from our film from Djibouti), or a bike clamp for shots like *Dreaming in Za'atari*, or a clamp that we connected to a cart inside the Rohingya refugee camp. While you don't want to overdo these shots, they can be a nice divergence from the usual static shot and create some dynamic motion in your film.



Sound:

"Depending on the shoot, we'll bring 2–4 lav mics (we go with the industry classic Sennheiser). We hook these up to the Zoom H4N Pro to record our audio — both ambient and interviews.

If we want to capture spatial audio, we'll use the Zoom H2N alongside the onboard audio of the camera. For an example of how we used spatial audio, check out our documentary *The Curse of Palm Oil*,¹¹ where our producers stayed up at all hours of the night to capture different sounds of the forest."

10. <https://ajcontrast.com/morocco>

11. <https://ajcontrast.com/malaysia>



Lighting:

For lighting, we generally stick to natural lighting and avoid filming in the dark. The GoPro Omni's strengths are definitely not filming in low light situations, as the footage is rendered extremely grainy.

However, we recently added these new portable LED lights to our kit — and we love them. They're super light, and the best part

is, they are flexible so you can bend them any which way. To hide them from the camera, you can wrap them around the base of a monopod.

You can use them to light up darker spaces in the evening, or even use them during the day to shine more light on darker spaces in the shot.

Additional equipment:¹²

Besides the obvious equipment like the cameras, audio, tripod and lighting, here's a list of other important gadgets or gear that we bring along:

- ▶ Extra extenders (mentioned above in our 360 camera kit)
- ▶ Extra AA batteries (for Sennheiser Lav mics and Zoom H2N and Zoom H4N)
- ▶ 2–3 Lens cloths (always, always, always keep these handy to wipe all of the camera lenses in the VR camera, because a single, dirty lens can ruin an entire shot)
- ▶ USB hub port (to import all of the memory cards of the VR camera, as well as to charge additional equipment)
- ▶ SD card readers
- ▶ An extra GoPro to take a plate shot for the tripod removal
- ▶ Duck tape and masking tape
- ▶ Headphones (to check audio levels)
- ▶ Laptop
- ▶ Charging strip to charge multiple devices and batteries
- ▶ External HDs (We bring two 2TB Lacie hard drives, one that is a master and the other that serves as a backup)

12. <https://medi.giphy.com/media/2fNJsCzXex7HiWoCkw/mp4.source>

Step 4: Storyboarding for filming and interviews

Before filming:

- ▶ Plan the scenes that you'll film based on your storyboard.
- ▶ Work to create a logical sequence, where the character's story is clear and easy to follow.
- ▶ Be patient in order to get the right shots, at the right time and in the right place.
- ▶ Be ready for any new discovery or surprise during filming.
- ▶ Be creative in choosing where to put the camera and where to film, in a way that adds context and/or richness to the story.

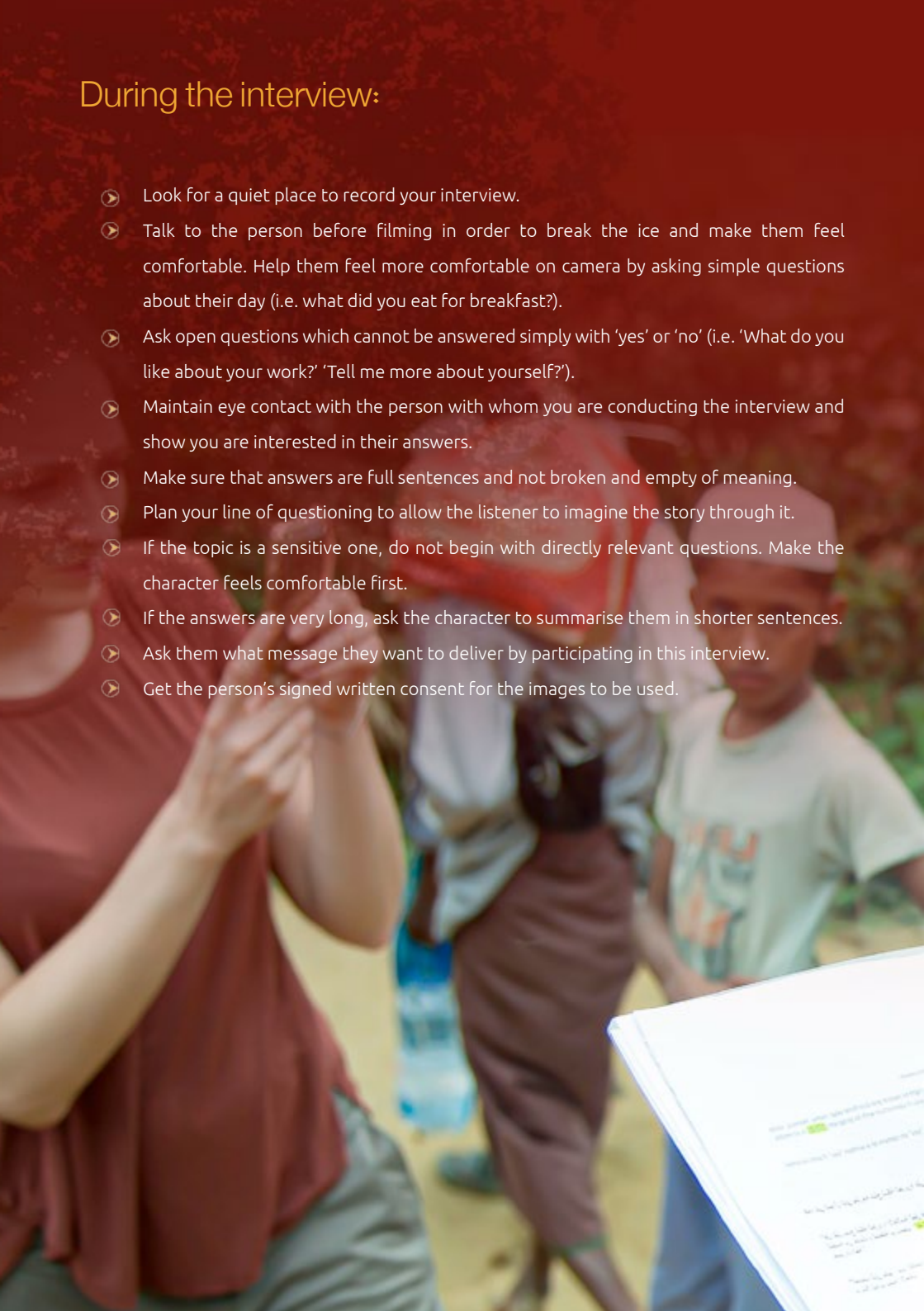
Before the master interview (with your lead character):

- ▶ Make sure you have a solid sense of the character and story before you start filming.
- ▶ Set an interview date with the character, and make sure they know how long the interview will take.
- ▶ Introduce yourself to the character and make sure that they are familiar with you and the purpose of the interview. Give them an idea as to the kinds of questions you will be asking.
- ▶ Find out whether the character is articulate and able to speak naturally in front of the camera.



During the interview:

- ▶ Look for a quiet place to record your interview.
- ▶ Talk to the person before filming in order to break the ice and make them feel comfortable. Help them feel more comfortable on camera by asking simple questions about their day (i.e. what did you eat for breakfast?).
- ▶ Ask open questions which cannot be answered simply with 'yes' or 'no' (i.e. 'What do you like about your work?' 'Tell me more about yourself?').
- ▶ Maintain eye contact with the person with whom you are conducting the interview and show you are interested in their answers.
- ▶ Make sure that answers are full sentences and not broken and empty of meaning.
- ▶ Plan your line of questioning to allow the listener to imagine the story through it.
- ▶ If the topic is a sensitive one, do not begin with directly relevant questions. Make the character feels comfortable first.
- ▶ If the answers are very long, ask the character to summarise them in shorter sentences.
- ▶ Ask them what message they want to deliver by participating in this interview.
- ▶ Get the person's signed written consent for the images to be used.



Recording in front of the camera:

- During the interview, sit under the camera or hide so you do not appear in the shot.
- Ask the character to introduce themselves again, this time in front of the camera.
- Ask the interview to answer a question directly connected to the main topic of the story as soon as they say their name, place of residence, and occupation.
- Decide the best answers from the full audio interview and ask the character to answer the same question again on-camera.

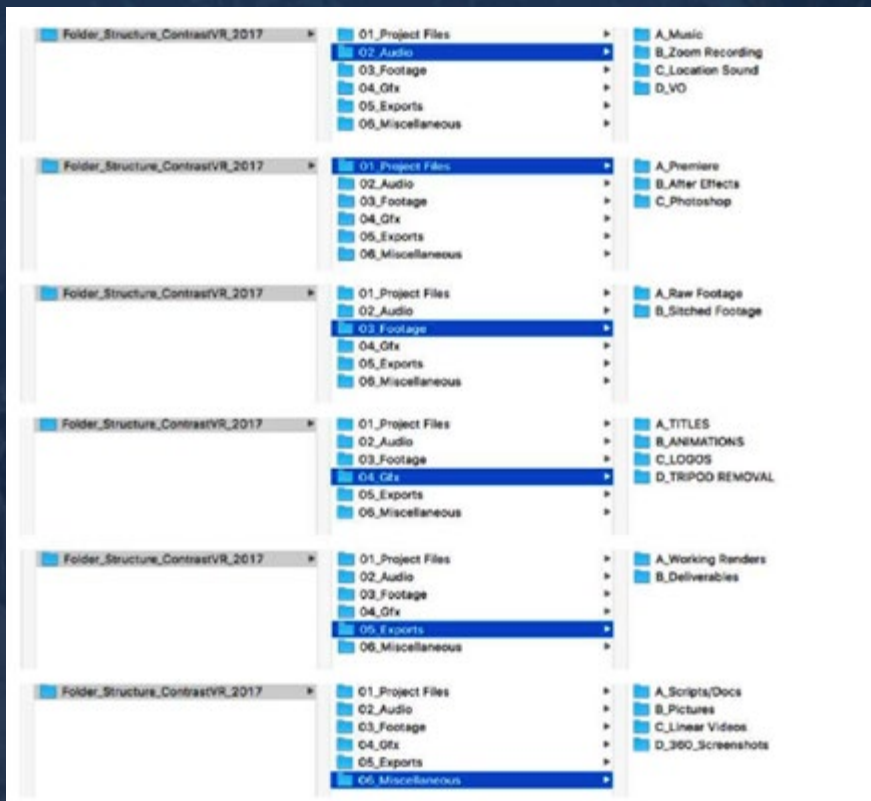


Step 5: Preliminary editing

The preliminary stages of post-production (editing) involve data management and image stitching.

1. Data management

Rule number one in post-production is organization. Creating a folder structure that helps keep all the material organized the exact same way for every project is extremely important.



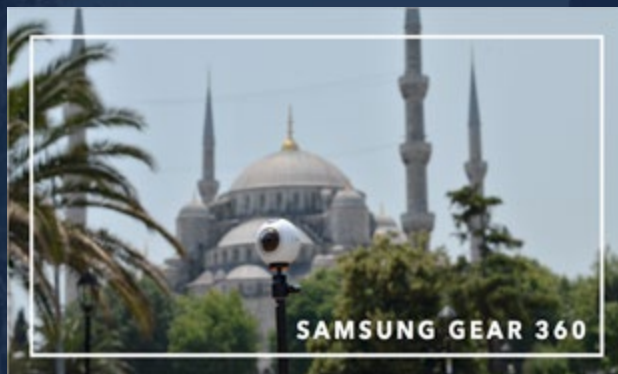
When it comes to VR post production, it is even more tedious than traditional film editing. Depending on the camera, you might have several files for one shot. For example, for the GoPro Omni, which uses 6 different cameras, you will have 6 different files for the same scene. You not only have to deal with all the raw footage that comes straight out of the camera, but you also have to keep track of your rough and fine stitched files, graphics, titles, tripod removal, audio files and various exports.

AJ Contrast uses the Adobe Suite for post-production: “Something that we keep in mind is to create multiple project files along the way (for Premiere and After Effects) and keep them all in a separate folder. We’ve lost project files quite a few times due to Premiere/After Effects errors.”

2. *Stitching*

Once your shooters, journalists or producers bring back 360 footage, it’s time to begin the post-production process by stitching the material — if they haven’t already done it.

Since a 360-degree camera has a number of different lenses, the files must be combined together to allow the scene to be viewed from different angles.



In order to stitch the 2016 version of the Gear 360 camera, a Samsung mobile device or Windows machine is required. If you do not have access to either option, you can download an After Effects template to stitch your files one by one -- you will also need a Skybox Converter license to use this template.

If you are using the newer version of the Gear 360 (2017), you can stitch your footage on a Mac/Windows machine or iOS/Android device. To ensure your files are stitched correctly without any errors, a good tip is to stitch the footage in groups of a maximum of 5 shots, or even less, at a time.



Other consumer friendly 360 cameras with quality good enough for distribution on social media have their own specific software and plugins for stitching. Some examples are Pixpro 360 Stitch and Xiaomi Yi.



Final step: Publication and distribution

You can publish 360-degree videos on social media platforms that support it: Facebook, YouTube and Vimeo. They can also be viewed using headsets set up for VR: Oculus, Samsung and HTC VIVE.



Headsets

Oculus Rift
VR Gear Samsung
VIVE HTC



Platforms

Platforms Social
Facebook 360
Youtube 360





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