A Case for Play:
Immersive Storytelling of Rohingya Refugee Experience

Ray LC[†]
Parsons School of Design
Northeastern University College of
Art, Media, and Design
rayLC@newschool.edu
http://www.raylc.org

Anika Ullah
MIT Media Lab
University of California, San
Diego Department of Visual Arts
anikanullah@gmail.com
https://www.anikanullah.com

Fabeha Monir
Photojournalist
Visual Journalism of Dhaka,
Bangladesh
fabeha.monir@gmail.com
http://www.fabehamonir.net/

ABSTRACT

The displacement of refugees from their natural homes have caused violence and estrangement all over the world, as victims, perpetrators, and hosts jostle for territorial and resource control, to the detriment of victims who live in unbearable conditions outside their homelands. There's often misunderstanding amongst hosts and Western media that see refugees as parasites and destructive agents who hoard valuable resources. Educating both sides of the refugee-host divide have involved programs like UNVR, which created immersive films following the conventional 2D filmmaking approach, portraying static scenes with narratively voiced pieces that attempt to put us inside the refugee camps to elicit empathy. Instead of relying on storytelling through voice as in conventional documentaries, we embarked on an audio-visual journey-based approach to show the daily lives of Rohingya refugees in Balukhali, Bangladesh using dynamic movements in VR space, spatial audio that surprise, and collaborative filmmaking that involves the participants as they empower themselves using 360 camera and phone as tools for exploration. Instead of investigating the hardships of refugees from a Western perspective, we enabled a boy in the refugee camp and his family to create a visual experience that represent their daily struggles the way they have become used to. The interactive VR film becomes an empowerment tool to enable self-expression in a corner of the world that have become used to being the observed as opposed to the observer, in turn taking advantage of VR as a medium for both immersion and capability to surprise in 4D.

KEYWORDS

Virtual reality, 360 film, social change, refugee camp, empathy.

[†]Correspondence and request for materials should be addressed to RLC (email: rayLC@newschool.edu).

1 Introduction

Documenting the truth often requires telling stories that faithfully represent the subjects in the way they are affected emotionally, not merely the cold reality. For example, showing only the physical destructions of 9-11 would not get at the truth of the way people were affected, both the perpetrators and the victims. Even showing the physical and verbal scenes without organization would not get at that most important element of what it means to us. Thus telling stories objectively can be closer to the truth than simply facts. But how do you tell stories objectively without agenda? How to represent your subjects in their subjective states? How do we distinguish genuine stories from the pretense of truth?

The new medium of Virtual Reality (VR) promises a new way for journalists to show the truth, by merely putting a 360 camera where events occur and assuming that it does not affect the natural state of its subjects. VR films like Chris Milk's "Clouds Over Sidra" put audiences in a static scene in the middle of the refugee camp to evoke empathy for the plight of its subjects (Milk et al, 2015). But VR fundamentally changes the responsibilities of the journalist filmmaker, as the producer and its sponsor quickly learn to produce material that evokes emotional responses for their own sake, making the viewer emotionally vulnerable due to the high level of fidelity (Kool, 2016). Because the director steps away from a completely immersive but static scene, we forget that the entire experience is orchestrated to evoke a certain type of reaction under the impression of duplicating reality. Unlike traditional filmmaking in 2D, the entire set is part of the VR experience, so that all arrangements with subjects have to be done well before hand, with mutual understanding.

How do we overcome the propensity to use VR to spew forth agendas? In order to tell the genuine story rather than the impression of truth, we aim to use VR in three specific ways that remind us of the limitations and ethics of the medium. 1. We aim *not* to hide the director filmmaker, but to make her a part of the truth-telling, for in making the documentary, we inserted ourselves into the sociology of the environment, so why should we disingenuously hide ourselves? 2. We invite the subjects to

make the film, empower themselves to express what they would like, giving them direct access to the audience and allowing them to have agency about being the portrayer and not just the portrayed. 3. We use dynamic movements and spatial audio from surprising sources to rethink the VR medium, reminding audiences that VR is telling us a story by the way an actor with agency moves her journey forward in time, and not a static representation of reality.

Together, these techniques show the viewer genuine experiences that coalesce into stories framed and imaged collaboratively by the creator and her subjects, illustrating VR as a medium for expressive filmmaking rather than as an absolute description of reality. In turn, it opens up opportunity for the filmmaker and her subjects to play together, to involve both parties in the documentary process.

2   Background

2.1   Historical Context

To investigate the 360-VR medium as collaborative play, we visited the Rohingya refugee camps in Southern Bangladesh to document a vulnerable community whose day-to-day activities are seldom known to the public. The Rohingya is a Muslim group previously living in the Buddhist Rakhine state in Myanmar, with a history of violence that cuts deep into the cultures of the respective communities (Ullah, 2016). During World War II, the Rohingya Muslims were aligned with the British while the Rakhine Buddhists supported the Japanese. After the war, the Rohingya were denied citizenship, and in the 1978, the Myanmar government launched operations to clear the area of the Rohingya, leading to formation of militant groups like the Rohingya Solidarity Organization (RSO), which use drastic means to attack the Myanmar borders with Bangladesh. After renewed attacks by the Arakan Rohingya Salvation Army (ARSA) in 2016, the Myanmar government began processes to systematically root hundreds of thousands of Rohingyas away from Myanmar using violence and humiliation tactics. Over 700,000 refugees fled to neighboring Bangladesh, whose government is dealing with massive populations, and wants to prevent further explosion by forced sterilization and repatriation (Milton et al, 2017).

Photographic images from both sides have appeared that seem to support different agendas. Myanmar officials claim one image supporting ARSA attacking its own village, but later investigation led to identification of Hindu arsonists. Amidst all the rhetoric from both sides is a need for real, immersive documentation of the refugees' plight and stories of how these events came about. Photos can often be faked (Figure 1), and the narrative stories of the victims do not come across from official documentation. Meanwhile, refugees themselves do not have means of making films or immersive experiences that can tell their story, making misperception on the Bangladeshi side common place. The public perception in Bangladesh as perpetrated by the government sponsored media is that Rohingya militants have been breeding in refugee camps, and that refugees

are given no freedom of movement (Rahman, 2010). As a developing country with a burgeoning infrastructure, Bangladesh has been reluctant to absorb the over 1.3 million Rohingya in its country, but UN resolution with Myanmar has been stalemate. The Bengladeshi authorities have portrayed the Rohingya as militant and self-serving outsiders who seek to benefit from using resources in Bangladesh. The result is seldom documented abdominal conditions.
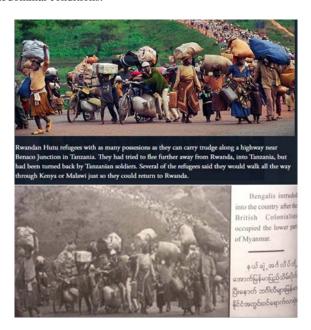

Figure 1: A 1996 photo of Hutu refugees of Rwanda (top) altered and described falsely as Bengalis who intruded into Myanmar after British occupation by Myanmar military's book on the Rohingya. (Source: Reuters, Poppy McPherson)

2.2   Virtual Reality as Medium

Human empathy is what joins us together despite diverse backgrounds and expectations. Humans are uniquely able to empathize not only with other humans, but animals, fictional characters, and even machines. Virtual Reality (VR) transports humans to a story environment where they feel the character's emotions by virtue of seeing the same situation and interacting with the same people at high degree of realism. This generates participatory empathy, which comes from our own experience of the subject, as opposed to affective empathy that comes as an emotional reaction to a different being's plight (Torisu, 2016). A study has shown that VR results in greater engagement and empathy scores compared to 2D displays when viewers saw a girl living in a refugee camp (Schutte & Stilinovic, 2017). Further studies found greater empathic response to color blindness after a VR experience, facilitating perspective taking (Ahn et al, 2013).

VR may be designed to immerse ourselves in other perspectives, but does VR actually change people's behavior enough to show that it is capable of driving activism? In a study looking at charitable giving to local refugee aid organizations, VR experiences of a destroyed Middle Eastern city, and not flat

monitor 360 video, led to greater number of givers and greater amount of donation per giver (Gurerk & Kasulke, 2018). What's more, perspective taking in VR led to a significant increase of post-exposure-experience petition signing, up from 61% to 82% compared to the traditional 2D screen-based equivalent (Herrera et al, 2018). Others have found that dissemination of VR material led to both positive and negative emotion increases that call for behavioral and political change, highlighting the role of VR outside its purely immersive property (Durnel, 2018).

The interaction of human emotion with VR experience is not as simple as one-directional influence, however. Personality traits are correlated with immersion in VR, suggesting that humans have purposeful intention over control of VR experiences (Shin, 2018). This bidirectional influence ushers in a VR landscape in which storytelling is no longer one-sided as in a traditional medium. Instead of storytelling from the point of view of a narrator informing her audience as in novels and movies, VR presents an alternative implicit storytelling perspective where the environment is set up and configured for self-exploration that leads to its own stories being told, as in gaming environments. Future immersive film practices will create spaces and social connections that form empathetic relations without an overt, direct narrative (Jones & Dawkins, 2018). We leveraged this opportunity with VR to create collaboratively empowering work that allows subjects to create their own stories to tell without deliberate narratives to guide the audience.

Figure 2: Film still from Milk and Arora's VR film about the Za'atari Syrian refugee camp in Jordan following a 12-year-old girl around to school, cafeteria, computer lab, and other daily activities. (Source: Within from unvr.org)

2.3   Virtual Reality as Journalism

VR as a medium for journalistic narratives promulgating sustainable peace has been at the forefront of development. Viewers are given a headset, headphone, and controller and allowed to roam in a virtual world whose environment can be created from photos or 360 videos. UN's VR documentary "Clouds Over Sidra" (Figure 2) tells the story of a Syrian girl refugee living in Jordan (Milk et al, 2015). Seeing the world from her perspective increases self-reported empathy and emotional responses, and facilitates behavioral changes like willingness to support humanitarian work (Durnel, 2018). Another VR film explores the life of an Ebola survivor in Liberia who helps others

heal through faith, and was shown at Sundance Film festival (Arora & Milk, 2015). Amnesty International generated a 16% rise in donations when the organization began distributing a VR program that allowed viewers to experience the Syrian civil war immersively.

Immersive work with the Rohingya and other refugees are not limited to VR experiences. While Al Jazeera's ContrastVR project has filmed an immersive Rohingya experience focused on the camp life of a young girl (Mickute & Gorbiah, 2017), other projects have included a play that documents 14 Rohingya youths who discuss onstage their families' experiences during the escape from Myanmar's oppressive raids (Zine, 2018). Theatre may be the most immersive form of experience of all since it duplicates the actual experience of being with subjects every time the play is performed. It is like VR using the real world. VR for storytelling of refugee experiences don't even have to be real footage. In another example of telling the story rather than reality is Khaled Hosseini's immersive animation about the death of a 3-year-old refugee boy who drowned attempting to escape the camp (Hosseini, 2017). Drawn in 360 video, it gives the feeling of the events surrounding the boy as told by his parent better than any real footage would be capable of.

Figure 3: Location of the Rohingya refugee camps in Balukhali, Bangladesh, a 3.5 hour drive away from the nearest town, Cox's Bazar. (Source: maps.google.com)

While these previous efforts utilize VR as an immersive medium, they tend to rely on static shots reminiscent of screen-based filmmaking. Sound is usually easily localized, and the camera has no action. This makes for a static set where the auteur filmmaker is completely absent from the theme, so that whatever is presented is proclaimed to be reality itself. This fails to recognize that behind the scenes, the director and staff have had to have numerous conversations and directions with their subjects, which are told to move freely in space, but with overt instructions given to them prior to the shot, and hence wholly invisible to the VR viewer. These experiences tend to be slow and show sad or depressing scenes designed to evoke sympathy as opposed to empathy. We often don't feel like it's the way life is in the camp, but rather the dreary life that we should believe exists there based on what the filmmakers have wrapped up and presented to us as an agenda. Most of these films use dubbed voices and westernized music, making the experience puzzling. They tend to have beautiful renderings of nature scenes that constrasts with the camp,

emphasizing their decrepit state. Point of view of the camera almost never shifts, in fear of dizziness in VR, and even the equipment that the 360 camera sits on is painstakingly smudged out in post-production, again emphasizing the lack of perturbing into the scene by the filmmakers.

However, the filmmakers *did* perturb the camp, by the very existence of the crew and the directions given out, for making the 360 film was an agenda that blurred out the true state of the camp the way it was lived in. Instead of this packaged process, can we create a more participatory method which involves both subjects and filmmakers, so that the product is an organic representation of what the journey was: that of outsider journalists exploring homes of a people they are curious about? Even with limited understanding, can we get refugees to play collaboratively with us, telling us a version of their own story?

Figure 4: Rohingya camp at block B56 of Balukhali in Bangladesh. The central football field is surrounded by shanty in all four directions of the hills.

3   Methods

We stayed in Cox's Bazar in the month of Ramadan in late May, and visited the Balukhali Rohingya camps by a 4-5 hour drive every morning, because we are not allowed to stay close to the camps (Figure 3-4). We had no power, and must leave before 3pm each day during Ramadan due to camp closure, so only refugees themselves can take videos in the evening. Upon arriving at the area, we climbed up the hills in block B56 to meet the Maji (leader) Salim. Working with the Program for Helpless and Lagged Societies (PHALS), Salim took us to Camp 8E, where we visited two families before deciding to work with the family of Ameena Khatun, who had 10 children (5 sons, 5 daughters) between them. Like most Burmese, the family doesn't have family names, so we refer to each of them by their unique first names. Sometimes even they can't remember everyones' names.

Ameena and Ehsan (her husband)'s family came from Patiya Para, Myanmar during the forced extradition (Figure 5). They walked through hills and forests for 16+ days in the heat of the burning sun and in the rain. The children became sick and they had to beg for rice from others on the way. The Myanmar military already burnt their houses down so there was no choice but to go

forward. People were seen jumping into rivers and falling from hills, fleeing from the military. They cooked only once every four days, and must rely on these provisions during that time.

One daughter of the family, Shamima, died on the way to Bangladesh. She was vomiting and having diarrhea, with very little to eat, but cause of death is unknown. Because there were so many family members, they had to leave her in the jungle and move on. No one has any mementos, souvenirs, photos, or clothing of hers, because they had no belongings from home. The only remnant of Shamima that Ameena Khatun has is in her memory. Ameena also can neither draw nor write, so Shamima's memory will be hard to pass on. The only thing she had wanted was her children's safety, so Ameena has difficulty dealing with this pain to this day. Currently they also lack provisions and clean water, but in Bangladesh at least they do not fear having the light on during Ramadan or fear practicing their religion.

Figure 5: Some members of the family of Ameena Khatun, including the father Ehsan (left), and the boy Mofizur Rahman (front left next to Ameena), who narrated the VR experience.

To tell the story behind the truth of the Rohingya refugee experience of the family of Ameena Khatun, we needed to describe their lives from different perspectives, so that audiences can be immersed in the multi-dimensionality of the narratives. Thus we took a multi-disciplinary approach consisting of 1. A narrative film about how Ameena and the family deals with the death of Shamima, as a way to serve as the lasting memory that otherwise would be lost to posterity; 2. A documentary about empowering refugees to express themselves by teaching them video-making using a phone during evenings at Ramadan when we don't have access to them; 3. A VR experience that takes the audience inside camp life, narrated and guided by Mofizur Rahman, with camera work and playful initiative by Mofizur and his friends in the camp. For the rest of the paper we will concentrate on the VR experience. For the film and documentary, see our accompanying [website](#).

VR filming was done using a Ricoh Theta V 360 camera attached to a TA-1 3D spatial audio microphone, and stitched and converted daily offline. Refugee-handled camera work was hand-held, while tracking scenes following Mofizur during his journey

were done by lifting a fully extended tripod above the head of the cinematographer. Mofizur and his companions were instructed only on how to hold the camera without obstruction, and allowed to roam freely around the house and to pass off the camera to others. Before recording the main interactions, subjects were given the camera to take a short footage. That footage is converted from two-fisheye view into 360 video format on the computer and shown to the subjects, who could interact with the 360 nature using the computer trackpad (Figure 6). We then loaded the 360 video into a Unity scene with a single sphere and inverted normal for display on the inside of the sphere. The result is exported to a Google Pixel XL phone for immediate viewing by the subjects as a quick prototype in VR. They were allowed to iterate as many times as desired before taking the main footage.

Figure 6: Subjects and members of the refugee camp in the 360 VR production interacting with the short footage they themselves took after using the 360 camera to record some movement associated with navigation using the camera.

4   Results

4.1   Unleashing the Auteur

Previous VR films in the refugee camp space exhibit static scenes, passively viewed subjects in narration, and hidden evidence of directorship and cinematography. Our work with the Rohingya attempt to address these issues to produce a more active experience that shows collaboration between subject and director.

Both "Clouds Over Sidra" and "Waves of Grace" contained long, static views where not much happens, but the camera is smudged out so that audiences cannot see the mechanisms of the filmmaking even when looking down in VR. This technique is even more pronounced in "My Mother's Wing," a VR film about a mother's loss of her children in Gaza (Arora & Palitz, 2016), which tends to narrate the experience like a traditional 2D film, with long voice-overs and subtitles. In one moment, even a car seat is emptied in order to accommodate the invisible but present audience. One static scene follows another with English voice overs and music composed to please Western tastes. The director's involvement is hidden from view, as is the behind-the-scenes production that led to the naturalistic behaviors found in

the film. Instead of showing the refugee experience in isolation, we recognized that any observational process is inherently transformative of the subject being studied (Eberhardt & Thomas, 1991). The moment we arrive at the refugee camp, we are dealing with subject preconceptions of what should be shown and not shown to us. For example, are these filmmakers wanting to make a sad story? Should we show them our sad side? What do they expect refugees to be like? Shall I show them what they want to see? These preconceptions necessarily influences the documentary, so that the supposedly objective film with an invisible narrator is already gone upon first arranging such a visit.

Instead we wanted to show the collaborative nature of such a visit. We are not the only ones observing, the refugees are observing us as well. Thus we should not be the only ones expressing ideas, the refugees have things they want to show as well. The first order of action was to show us not hidden from view but as part of the collaborative process. Instead of objective cameras planted on the ground, we held up the 360 camera with our hands and holding on to our tripods. We played in the football games they play, not hiding from it (Figure 7). We followed along during the tour, and participated in passing the camera to each other. In turn our camera exists in the scene, not apart from it. The story that emerges is not an impossible attempt to hide our presence, but rather to document how visiting refugee camps occur, and how we learn from each other.

Figure 7: Involvement of the creators in 360 videos for VR. A scene where the journalists are working with documentation of the family while the Mofizur Rahman enters with the camera (above). A scene where the director plays football together with the Rohingya children (below). (Screenshot)

4.2   Subject Empowerment

Current VR experiences reply on filmmakers to provide the context, both in terms of where the film takes place and who we

can meet in it. In "The Displaced," a VR film about three children from refugee camps, we get to meet the protagonists but never follow (Ismail & Solomon, 2015). We are ferried on a boat we cannot step away from and asked to read subtitles as the protagonists read their lines. Like other VR experiences, we are introduced to the protagonists but when we really want to see them face-to-face, we are confronted instead with desolate landscapes. What if instead of being a passive subject, we let protagonists take the camera where they wish to take us, and let them dictate the terms of the journey?

Figure 8: Empowering refugee subjects in creating their own voice. Providing a phone and instructions on use to a family member so that they can be free to document their evenings during Ramadan (above). Mofizur Rahman giving tour of his home using a 360 camera as perspective (below). (Screenshot)

To empower the refugee subjects, we took four different approaches to making the VR experience, and incorporated them into the film: 1. We gave the family a Samsung phone capable only of taking video and photo, and asked them to document evening activities when we were not there, and used their content in our subsequence documentary and exhibition; 2. We showed them how VR filmmaking works from taking footage to importing to stitching to viewing the binocular result on a phone, then asked them to take the camera around the house and beyond to give us a tour as they pleased (Figure 8); 3. We also followed the subject around as they move about town, so that we with the camera mounted high above us on a tripod, is the follower to the initiative of the subject; 4. We let the children learn about VR filmmaking via the demo and then let them pass the camera between themselves, allowing them to see what their presence and faces look like afterwards on the stitched video on the computer, then let them again play with passing the perspective amongst themselves and playing with the audiences' view and their own creative movements (Figure 9).

The result of this initiative-based filmmaking is an increase in the way the refugees promote their own stories. After learning initially about how their movements in space in the camera translated to a 360 view that evolves in time on the computer and in binocular form in the phone, they began taking the camera to places we did not envision. Mofizur Rahman took the camera and put it on the cabinet, when the family began making semai (a food item that was also Shamima's favorite), in order to give us a better view. The children took turns playing with each other with the camera, giving it back and forth to each other without choreography. At the football field, following the person pursuing the ball led everyone to follow the camera, and to play with it as if it was part of the game that they are orchestrating. When we showed the family and children some of the footage they were helping to make, they flocked to the computer (Figure 6) and marveled at the technology and the way they had played with it.

Figure 9: Empowering refugee subjects in expressing their own voice. Following the trek laid out by Mofizur Rahman as he takes his friends and us around the camp, showing us his favorite places (above). The children passing the 360 camera around amongst themselves, playing with perspective (below).

4.3 Dynamic Video and Audio

The static nature of video and audio in VR productions makes it seem as if it's part of the limitation of the genre. From "Clouds Over Sidra" to "I am Rohingya," each film is reluctant to tire the audience, or to push the boundaries of what is possible when the camera moves in space and time. What encapsulates this best is "Meet the Soldier," and "Refugees," two VR films from Scopic (Cherim, 2018). In each case, great amount of movement from soldiers running to refugees arriving on harbor is portrayed in the experience without a jolt of movement of the 360 camera. With catastrophic events involving shooting and pushing happening all around the view, the audience is fixed to the ground (fixed to the

stones of the beach in the case of the refugees) without a trace of movement. Does this portray the viewer in a 360 film not as part of the scene at all? Are we not a witness to this story but rather a God-like overseer? This approach has been taken by every major VR refugee experience, along with (mostly) Western-created music and sound that fails to fit to the subjects but rather to the audience for whom the experience is intended. It is catering to the eye that is used to cinema, the subtitles, the fixed camera, and the melodramatic music. But to document the real refugee experience as opposed to the sad, drawn out view that is not part of their lives (which are generally happy and playful in their own ways), we have to play with perspectives and surprises, to fit the medium to the view of the subject as oppose to our own.

Figure 10: Audio and spatial dynamism in VR film. Following a protagonist with a 360 camera during play while he chases after the ball, as if audience is also chasing the ball (above). Subtitle coupled to place in the environment where voice should emanate or point towards (below). (Screenshot)

To show dynamic interactions reminiscent of play, we traveled with the 360 camera either on a tripod that we move, or by holding by hand. We also enabled static scenes where families are eating or making food, only to have Mofizur Rahman take the camera during the recording and go outside. View movements come from movements in vessels like the vehicle that took us to camp, from refugees taking the camera to places like football fields and kitchens, and from the cinematographer following the subjects while carrying the instrument (Figure 10). Interactions are unpredicted, such as when children interrupt us from behind, taking advantage of the VR medium to truly use all 360 degrees.

Audio of our VR experience is also dynamically enabled to surprise and play in 3D. Family members frequently interrupt our movement in following Mofizur Rahman with voices that occur behind us as we move forward, causing audiences to turn around, a feat that is unique to VR compared to 2D movies, and which is

not taken advantage of by static-scene VR refugee films up until now. We also used only original voices of the refugees with subtitles placed at the location of their speaking to heighten the immersion with spatial audio (Figure 10). We used music improvised by Rohingya musician Takir, as recorded by the group Music in Exile, to give a genuine voice to Rohingya musical creative roots, as opposed to Western traditions. The resulting production is filled with Rohingya initiative, collaboration, and influence.

ACKNOWLEDGMENTS

REFERENCES

[1]   Milk, C., Arora, G., and Pousman, B. "Clouds over Sidra." VRSE: Switzerland (2015). Online: https://www.with.in/watch/clouds-over-sidra/

[2]   Kool, H. The ethics of immersive journalism: a rhetorical analysis of news storytelling with virtual reality technology. *Intersect*. 9: 3 (2016).

[3]   Ullah, A. Rohingya Crisis in Myanmar: Seeking Justice for the "Stateless." *Journal of Contemporary Criminal Justice*. 32: 3 (2016).

[4]   Milton, A. H., Rahman, M., Hussain, S., Jindal, C., Choudhury, S., Akter, S., Ferdousi, S., Mouly, T. A., Hall, J., Efird, J. T. Trapped in Statelessness: Rohingya Refugees in Bangladesh. *International Journal of Environmental Research and Public Health*. 14: 942 (2017).

[5]   Rahman, U. The Rohingya refugee: a security dilemma for Bangladesh. *Journal of Immigrant and Refugee Studies*. 8:2 (2010).

[6]   Torisu, T. To what extent can virtual reality and machines stimulate empathy? *UCL Interactive Architecture Lab*. (2016). Online: http://www.interactivearchitecture.org/to-what-extent-can-virtual-reality-and-machines-stimulate-empathy.html

[7]   Schutte, N. S., and Stilinovic, E. J. Facilitating empathy through virtual reality. *Motivation and Emotion*. 41: 708 (2017). DOI: 10.1007/s11031-017-9641-7.

[8]   Ahn, S. J., Le, A. M. T., and Bailenson, J. The effect of embodied experience on self-other merging, attitude, and helping behavior. *Media Psychology*. 16 (1): 7-38 (2013).

[9]   Gurerk, O., and Kasulke, A. Does virtual reality increase charitable giving? An experimental study. SSRN (2018). Online: https://ssrn.com/abstract=3072002

[10] Herrera, F., Bailenson, J., Weisz, E., Ogle, E., Zaki, J. Building long-term empathy: a large-scale comparison of traditional and virtual reality perspective taking. *PLOSONE*. 13 (10): e0204494 (2018). Online: https://doi.org/10.13.71/journal.pone.0204494

[11] Durnell, L. A. Emotional reactions of experiencing crisis in virtual reality (VR)/360. Fielding Graduate University ProQuest: 10747522 (2018).

[12] Shin, D. Empathy and embodied experience in virtual environment: to what extent can virtual reality stimulate empathy and embodied experience? *Computers in Human Behavior*. 78: 64-73 (2018).

[13] Jones, S., and Dawkins, S. Walking in someone else's shoes: creating empathy in the practice of immersive film. *Media Practice and Education*. 19 (3): 298-312 (2018). DOI: 10.1080/25741136.2018.1520538.

[14] Arora, G., and Milk, C. "Waves of Grace." VRSE: USA (2015). Online: https://www.with.in/watch/waves-of-grace/

[15] Mickute, V., and Ghorbiah, E. "I am Rohingya." ContrastVR: Bangladesh (2017). Online: https://contrastvr.com/rohingya

[16] Zine, Y. "I am Rohingya: A Genocide in Four Acts." Innerspeak Media: Bangladesh (2018). Online: https://www.youtube.com/watch?v=g7XXolxFKi0

[17] Hosseini, K. "Sea Prayer: a 360 story inspired by refugee Alan Kurdi." The Guardian (2017). Online: https://www.youtube.com/watch?v=LKBNEEY-c3s

[18] Arora, G., and Palitz, A. "My Mother's Wing." VRSE Within: USA (2016). Online: https://www.with.in/watch/my-mothers-wing/

[19] Eberhardt, L. L., and Thomas, J. M. "Designing Environmental Field Studies." *Ecological Monographs*. 61 (1): 53-73 (1991).

[20] Ismail, I., and Soloman, B. C. "The Displaced." New York Times: USA (2015). Online: https://www.youtube.com/watch?v=ecavbpCuvkI

[21] Cherim, T. "Meet the Soldier." Q42 Hack the Planet: USA (2018) Online: https://www.hack-the-planet.io/meet-the-soldier/