

# Chapter 1

## Augmented Reality Activism

Mark Skwarek

### 1.1 Introduction

Arguably two of the most important activist events in recent US history were that of the Occupy Wall Street Movement and the whistle-blowing by Edward Snowden (see Fig. 1.1). The two events highlight differences between physical and virtual approaches to activism and their end results.

Many, including some of the mainstream media, argue that the physical presence of protesters in the streets of the Occupy Movement accomplished very little if nothing at all. Yet Occupy created a movement which organized and inspired a new generation of activists, sweeping across the globe. In contrast, Snowden's leaked information shook American society to the core. Although both actions utilized technology, Occupy was largely an effort that took place by taking over the real world with people on the ground. Snowden's action was accomplished largely through the use of technology and courage. The implications of his actions have changed the way we think about communication and the political elite. Does the impact of technology give activists the upper hand in the effort to create change in society or does it remove people in the street from the equation? An emerging technology called augmented reality has the ability to combine both the physical experience of the streets and digital experience of the Internet. AR has the power to take net-based activism such as blogging or even hacktivism (hacktivism is activism with hacked electronic equipment. See <http://en.wikipedia.org/wiki/Hacktivism>) and turn it into a real-world experience. AR allows activists to place their messages at specific locations anyplace on the face of the earth and share those messages with others either physically at the site or online.

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**Fig. 1.1** Mark Skwarek, *ProtestAR*, AR Zuccotti Park occupiers in front of NYSE (2011) (Images reproduced courtesy of the artist)

The effects of both Occupy and Snowden were felt across the globe. While both actions had tied to technology, Occupy was largely about the people taking over public space and voicing their problems with the failure of the system during an economic meltdown. Snowden's information leak was done with the aid of technology, by infiltrating the NSA's system and removing computer files that exposed their misdeeds.

In the wake of the initial Occupy Wall Street Movement, the question of the activist's role in modern-day society comes into question. What Occupy accomplished raises many heated debates. What is not in question is that the movement swept across the nation and then the world with the help of the Internet and social media.

Technology in the hands of the masses has had a profound impact on the history and reach of activism. The public now has access to technology which to most people was unimaginable only a few years ago. Now relatively inexpensive, incredibly powerful, networked mobile technology is beginning to find its way into the hands of people around the world. The new technologies grant the public abilities which would once be considered superhuman, but also create a tool that can be exploited, manipulated, and used to spy upon the public.

Some activists have begun working with AR to see its potential as a tool for social change. The works covered in this chapter explore what makes AR unique as a medium and which of its qualities can be best utilized to further activist causes.

This text will document the first activist explorations with AR, what has been done, and compare it to activist approaches from the past and future.

## 1.2 Past Activists and Their Technology

Activism has a long and accomplished history of creating change on a global scale long before the incorporation of electronic technology. Societies have always organized against repression by any means available. They have been organizing and participating in mass protests against the political and corporate elite since the beginning of recorded history. One of the first recorded mass protests took place in ancient Egypt when workers constructing a royal necropolis did not receive payment. They performed a sit in inside the mortuary temples and refused to leave until they received it (Andrews 2012).

Recently, Egyptians again rose up in protest and occupied the Tahrir Square. This time they were aided by technologies like cell phones and social media. With or without technology, humans will adapt to the situation and use whatever is available to create social change when faced with injustice. Long ago fires and bells were used to signal approaching danger. Paul Revere used lanterns to warn of the approaching British forces. Technology will never be a fix-all solution to fight injustice, but it can aid activists to help level the playing field against the corrupt elite.

Another example: In 1888, Jacob Riis began documenting the horrific living conditions of the lower classes in the New York City slums (see Fig. 1.2). Riis made their largely unseen and unknown living conditions visible to the world by using the newly invented flash photography technology. Riis pioneered the use of the flash to capture images in the dark alleyways and interiors of the tenements and slums of New York City. Riis's images had previously been impossible to create before the use of the flash (Yochelson et al. 2007).

More recently art activist Krzysztof Wodiczko began pioneering guerilla projection; he utilized very powerful machines capable of projecting images onto entire building facades (see Fig. 1.3). In 1985, he famously projected a swastika onto the South African Embassy in London for a period of about 2 h before it was shut down by the police. Although the work was short lived, photographs of the intervention were circulated around the global press reaching the eyes of millions (Barnett 2009).



**Fig. 1.2** Jacob Riis, *Five Cents a Spot* (1974) (Images reproduced courtesy of the Museum of Modern Art)

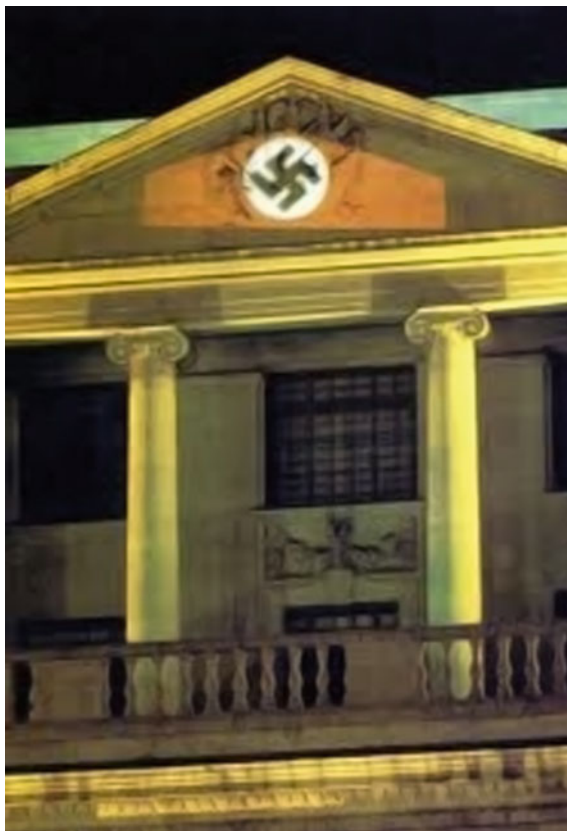
### 1.3 Augmented Reality Activism

Activist approaches of the past may have become less effective or may not have worked as effectively against the new tactics of the political and financial elite. The techniques used by the ancient Egyptian royal necropolis workers to organize may not have been as effective if duplicated for a twentieth century occupation.

The Critical Art Ensemble (CAE) argues: “At one point in time the control of the street was a valued item. In nineteenth century Paris the streets were the conduits for the mobility of power, whether it was the economic or military in nature. If the streets were blocked, and key political fortresses were occupied, the state became inert, and in some cases collapsed under its own weight. This method of resistance was still useful up through the 1960s, but since the end of the nineteenth century it has yielded diminishing returns, and has drifted from being a radical practice to a liberal one” (Critical Art Ensemble 1997).

Some see the Occupy Movement as fitting CAE’s classification having achieved very little in the form of political change. Yet the movement spread over 951 cities across 82 countries inspiring a global community of activists (Bell 2011). The power of the digital network and the effect it can have is unquestionable such as the cyber attacks which shut down the Estonian Internet in 2007. Yet human beings are

**Fig. 1.3** Krzysztof Wodiczko, *Projection on South Africa House*, Trafalgar Square, London (1985) (Images reproduced under creative commons)



social creatures who will naturally form communal groups when oppressed by those in wielding power. AR is the medium that has the power to bring CAE's electronic civil disobedience and the actions in the street together.

AR allows ideas and messages to be overlaid onto the real world digitally with the purpose of achieving activist goals. Activists can create work with AR software such as Layar and Junaio to make their own inexpensive AR protests using their personal smartphones. Having access to low-cost tools allows more freedom to create and distribute activist messages rooted to the physical world. The goal is generally for the message to reach and mobilize the largest audience possible. AR can turn the global community into an audience while at the same time giving them a voice.

## 1.4 The Case for Augmented Reality

AR is a technology which has recently become much more accessible to the general public in parallel with the invention of the smartphone. Mobile technology is sweeping the globe. A trickle-down effect has mobile technology beginning to reach developing countries (Carter 2013). More and more people worldwide will have access to networked mobile devices such as smartphones and tablets.

Mobile AR gives activists the ability to make anything anywhere with no cost besides access to a computer and an Internet connection. The borders that separate public and private space no longer restrict the activist's vision. An activist can trigger a protest in a city even when he or she is sitting half way across the globe.

AR can never replace the physical presence of people just like it can never replace reality as a whole; it is merely a tool just like the other tools used by the activists such as placards, signboards, graffiti, fliers, and blogs.

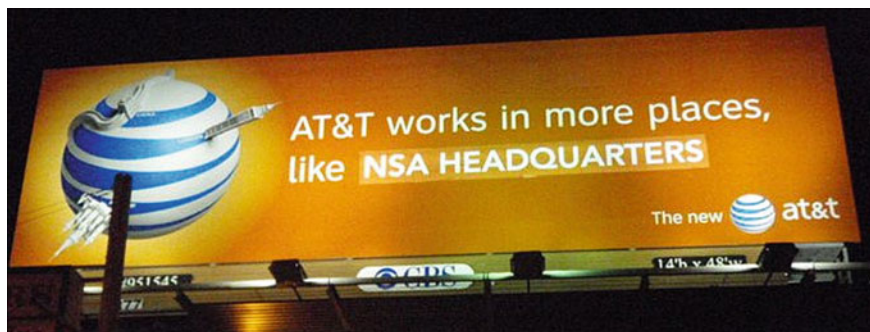
AR is ideal as a social tool to generate conversations in and around the community. It is often experienced in public space at the site of a problem which creates an opportunity to engage people in conversation. AR can create experiences which make people laugh, cry, or think deeply. These experiences can be shared in real time, allowing millions to relive atrocities in hyperrealistic detail as they are happening. This conversation and experience can be easily extended to the Internet and social networks with ease.

## 1.5 Augmented Reality Activism in the Present

AR activism finds roots in the Situationist's idea of "detournement." In detournement, the artist or activist appropriates an existing media artifact and then alters it with the purpose of giving it new meaning (Boyd and Mitchell 2012). Activists do this with subversive goals, often targeting corporations and advertising. Culture jamming is a modern take on the Situationist's detournement. "Many culture jams are intended to expose apparently questionable political assumptions behind commercial culture. Common tactics include re-figuring logos, fashion statements, and product images as a means to challenge the idea of 'what's cool' along with assumptions about the personal freedoms of consumption" (Boden and Williams 2002).

Some of the first AR activism was inspired by the work of culture jammers and graffiti artists who boldly created works in public spaces without permission from the establishment. Often times these messages were interventions, challenging the notion of public and private space. These activists often modified commercial messages to pointing at social injustice and political issues. Culture jamming interventions by the art activist's groups like the Billboard Liberation Front remix corporate billboards to create subversive political messages (see Fig. 1.4). The process of remixing existing content is ideal for AR activism because it requires minimal effort on the part of the activist.





**Fig. 1.4** Billboard Liberation Front, Milton Rand Kalman, *NSA\_2* (Images reproduced courtesy of the artist)

Logo hacking allows activists to easily target corrupt corporations and expose their misdeeds by generating subversive messages on the corporation's own logo or advertisements. This turns the corporation's own logo against them; countless logos now act as billboards for the activist cause. The activist simply alters the target's logo and/or commercial image creating a subversive version of the original. The majority of the work has already been done by the activist's target. AR logo hacking is the equivalent of the Situationist's *detournement* with modern technology. What makes AR special from past forms of subversive media remixing is that once the logo hack has been created it affects all the logos of the target entity around the world.

"The leak in your home town" was a smartphone app which overlaid the British Petroleum (BP) sun logo with an AR broken 3D pipe with oil gushing from it. The work was in reaction to the BP oil pipe disaster in the Gulf of Mexico in the summer of 2009. During the BP gulf crisis live video feeds of the broken BP pipe at the bottom of the Gulf of Mexico dominated the media. "the leak in your home town" turned the 2D TV image into a 3D experience (see Fig. 1.5). To activate the piece, viewers had to download the app and then aim their cameras at any BP logo. Once the app recognized the BP logo, the same broken 3D pipe would emerge out of the BP flower. Then, the black, boiling smokey oil would plum violently upward. People could walk around the pipe in 360° with their smartphones while watching the animated smoke. The broken pipe and smoke would appear every time they viewed a BP logo with the app. The app tied the spectacle directly to BP's corporate image. The app was the first activist work with mobile AR and is cited by World Trademark Review as the first "AR logo hack" (Smith 2010).

AR logo hacking is using someone's copywritten or trademarked image to generate AR content which is subversive and or done without the owner's permission. Oftentimes the AR enhances the owner's logo or symbol in a cynical way. Logo hacking works because of a process called image recognition. The smartphone's camera sees the copyrighted or trademarked image, an advertisement or object, and then uses its position to orient digital content on top of it (see Fig. 1.6).



**Fig. 1.5** Mark Skwarek and Joseph Hocking, *the leak in your hometown*, Augmented BP logo (2010) (Images reproduced courtesy of the artist)

At the time this project was created, there were no laws passed addressing image recognition and logo hacking. Today, laws have begun being passed that regulate some of the uses of AR. More laws are sure to come with the continued adoption of augmented reality.





**Fig. 1.6** The Heavy Projects, *Pirate Banker*, turns Pirates of the Caribbean’s “Captain Barbossa” into Goldman Sachs CEO Lloyd Blankfein with AR (2011) (Images reproduced courtesy of the artist)

## 1.6 Exposing the Unseen

One of AR’s most powerful qualities is that it allows things which cannot be seen by the naked eye to be visible with a smartphone. Walls, doors, private property, and even national borders are easily overcome with AR. Any sort of visual or physical obstruction can be circumvented with AR and an Internet signal (see Fig. 1.7).

Google Goggles allows the public to look at an object or text with their smartphones and call up fairly extensive amount of information about it from the Internet. Using this same technology, AR has the power to expose information related to corruption, pollution, and injustice that were once safely hidden behind walls, boardrooms and the like. AR cannot only tell you where to buy the consumer item in front of you, but it can also let you meet the person who made it. With the “Meet the MakAR” project (shown at Eyebeam’s Activist Tech Demo Day), you can see and hear the worker as they build your consumer product. The app workers when the smartphone’s camera is aimed at a consumer product. When the app recognizes the product, it generates a real-life worker who possibly made it with audio telling their story.

In the project *Erase the Separation Barrier*, AR was used to create a large hole through the Israeli–Palestinian Separation Barrier (see Fig. 1.8). The separation barrier is a wall that segregates Palestinians from the Israeli population. People may



**Fig. 1.7** Mark Skwarek, *arOCCUPY app*, shows Wall Street bank bailout amounts (2011) (Images reproduced courtesy of the artist)

not move freely from one side to the other. Military checkpoints are the only gateways. To pass, one must have official papers and wait in lines that can take well over two hours. For many people, life inside the barrier is all they have ever known. The Erase the Separation Barrier project allows people on either side of the barrier to look through the wall and see what was actually on the other side. For some this might have been the first time they had ever seen what was on the other side of the wall. The most recent satellite images, a topographical map, and documentation from ground level at the site of the hole were used to create an accurate model of what was on the other side of the wall. Erase the Separation Barrier is an example of diminished reality. Diminished reality removes parts of reality with AR instead of adding to reality. Future iterations of the project will update with real-time satellite feeds increasing the resolution of the experience.

AR allows protesters to go virtually where they never could in reality, such as the Augmented Reality Korean Unification Project placed the first AR in North Korea by overlaying a North Korean military outpost along the North–South Korean border (see Fig. 1.9). The Augmented Reality Korean Unification Project used AR to erase symbols of war and tension that exist in North Korea and South Korea. The work attempted to create a common ground by making a vision of a



**Fig. 1.8** Mark Skwarek, Daz Chandler, and Ghassan H. Bannoura *Erase the Separation Barrier*, see through the Israeli–Palestinian Separation Barrier with AR (2011) (Images reproduced courtesy of the artist)



**Fig. 1.9** Mark Skwarek, *Korean Unification Project*; military structures and symbols of the ongoing Korean War are erased with AR (2011) (Images reproduced courtesy of the artist)

unified Korea at peace. The work makes it look as though it is not there. The Augmented Reality Korean Unification Project is another example of diminished reality. The creation of the project required traveling to all accessible points along the North–South Korean border and erasing the military structures with AR. This included traveling into North Korea while the two countries were shooting at each other.

## 1.7 Cultural Loss

In the age of globalization, the history and culture of the past is often forgotten in the wake of change. The intrusion of modern pressures polarizes ethnic and religious communities as the forces from the outside world threaten the homogeneity of their structure. These communities often react by isolating themselves from outsiders (White 2012). AR can serve as a historic documentation of these periods of change, a reminder of people and culture of the past. AR differs from past forms of historic documentation because it can locate the culture, events, and people of a given time in the location where they lived in the physical world, rather than in a book or archive. In the *Mechanics of Place* mobile art project, developed by Hana Iverson and Sarah Drury, participant Kerem Özcan addressed this issue of cultural loss on Bogazkesen Street in Istanbul, where the tensions of historical change are clearly visible. Istanbul was once known as a crossroads of the world, where people of different races and religions lived together in peace. The intermix of different religions and ethnic populations contributed to the Ottoman Empire's status as one of the world's richest cultures. A recent surge in Muslim nationalism has led to the shunning of outsiders and their cultures. Groups outside the Muslim community are being pushed out, and their presence erased. Özcan re-populated the Istanbul Street with fictionalized residents—people of varying cultural backgrounds, who once made Istanbul the “melting pot” of the world.

## 1.8 Augmented Reality and Censorship

In 2011, Turkey banned 138 words from Turkish Internet domains. Words including “homemade,” “hot,” “nubile,” “free,” and “teen” were part of the censorship campaign against anything insulting to Turkishness and political extremism (Senerdem 2011). Some saw this as part of a crackdown and tightening of religious intolerance by the Turkish government. Petek Kizilelma and Hana Iverson took on Turkey's “forbidden words list” with an AR work that used the words as graffiti in the streets of Istanbul.

Tamiko Thiel's work “Shades of Absence: Governing Bodies” addresses censorship by government officials in the art world. Thiel puts golden silhouettes of censored artists inside the walls of the Corcoran Gallery of Art—including Robert Mapplethorpe, whose planned 1989 show *The Perfect Moment* was canceled by the museum's director in a preemptive act of self-censorship. Conservative members of Congress had called Mapplethorpe's work “obscene” (Katz 2009).





400 protest related augments. At Wall Street AR excited a new group of the global community about the OWS movement. Many of whom would not be able to reach Wall Street due to real-world obstacles such as distance and travel costs. These people created messages and protest works that were seen heard from Wall Street to the other side of the earth. #arOWS was organized by Mark Skwarek whose stated goal was to use AR technology to get more people to come out and participate in the OWS movement. #arOWS showed power of AR technology to deliver the activist's message to Wall Street's front doorstep even though the FBI and police had spent millions and millions of dollars trying to stop them. AR was able to overcome their surveillance, barricades, horses, and excessive police numbers.

One of the iconic works of #arOWS was the ProtestAR app. The app took the protesters from Zuccotti Park and placed them directly in front of the NYSE. The app was created from pictures and audio taken of the occupiers and their messages. The occupiers were cut out of the pictures using image editing software. The cutouts were turned into virtual AR images and placed in front of the NYSE along with recorded sound bites made by the protesters. Organizers of #arOWS went to the forbidden protest zone in front of the NYSE on almost a daily basis and would show the public the augments on a tablet. ProtestAR allowed the occupiers to protest in front of their specified target, the NYSE and be heard.

An interesting comparison between activists working in the physical and those working with AR can be made with AR "Money Grab" by Todd Margolis, and "Reign of Gold" by Tamiko Thiel on the one hand, with the physical intervention "The Day the NYSE went Yippee" by Abbie Hoffman and Jerry Rubin on the other. All of the works were activist interventions that had money falling over the NYSE. In 1967, Hoffman and Rubin staged an intervention inside the NYSE and threw handfuls of real money from a balcony onto the traders on the stock market floor. In 2011, Margolis and Thiel made AR money rain continuously over the NYSE. Both events were well documented and were written about in the press allowing for the AR experience of falling money to be compared to the physical one. To have seen both the physical and AR works, the viewer had to be present at the NYSE. The physical intervention of Hoffman and Rubin was short lived because they were detained almost immediately after starting. The work certainly provoked a reaction from the day traders who witnessed the event. "Some of the brokers, clerks and stock runners below laughed and waved; others jeered angrily and shook their fists" (Ledbetter 2007).

Very few, if any of the general public witnessed the intervention because it happened behind the closed doors of the NYSE. Their work was successful because news press was there to capture and write about the event. In contrast, Margolis and Thiel's works were seen by many of the public (including day traders) who were walking around the NYSE at random times. We do not know if the traders inside the NYSE witnessed the falling money but many were aware of the work. The AR money never stopped falling, so the event is still ongoing and documented to this day. When comparing the physical to AR, it is very hard to beat the emotion of being under real falling money with AR. This difference is a major divider of the physical and AR interpretations of the intervention. Could the effect have been



uplicated with AR? Yes... Margolis and Thiel could have linked their AR money to actual currency like Bitcoin that viewers could have collected. This could have generated the similar excitement and personal investment of Hoffman and Rubin's work. Both approaches received news press largely because of their novelty. In the end, it was the press which brought the events to the global public's attention.

## 1.10 Augmented Reality Flash Mobs

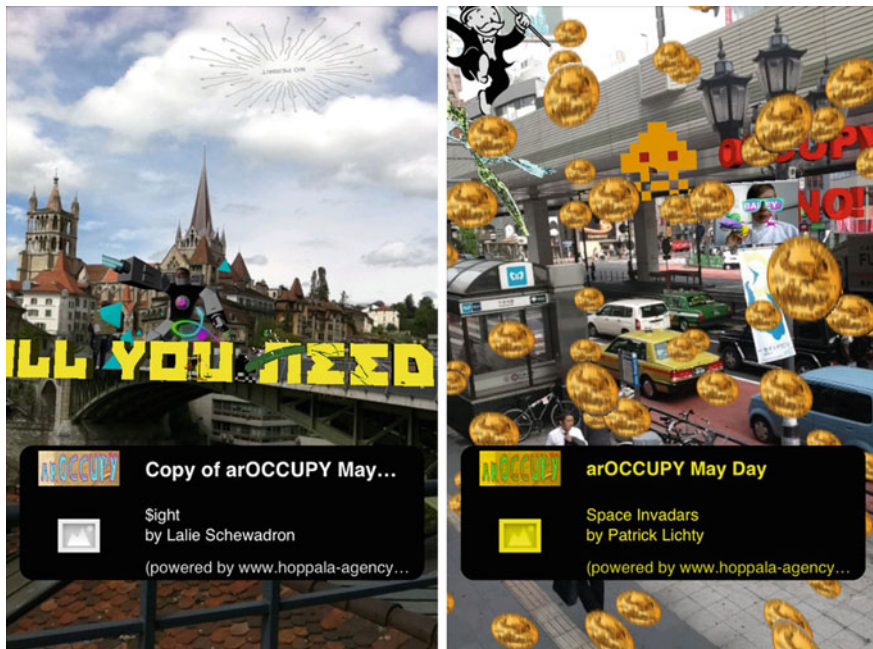
At the height of the #arOWS protest, a call went out on the Internet for the general public to converge on the New York Stock Exchange in the form of an AR Flash Mob (see Fig. 1.11). Critics of the #arOWS movement said that the people who needed to see the AR protest in front of the NYSE [those working in the NYSE and the general public passing by] were basically unaware that it was even taking place. The protest was invisible to the naked eye. To view it, one needed to have a mobile device with the correct app installed. The goal of the flash mob was to overcome the AR technology barrier and get it seen and in the hands of the public. On November 12, 2011, a group of seemingly ordinary citizens converged on the NYSE armed with smartphones and tablets. Participants were asked to dress in plainclothes which would not identify them as members of the OWS movement because of the heightened police security. Participants were told to find a spot along the metal NYPD barricade that surrounded the NYSE. The goal was to surround the barricade and NYSE with AR flash mobbers. Participants were told to face their smartphone or tablet displays so that the public walking by could see and hear the AR protest. At exactly 4:00 [the beginning of quitting time for NYSE workers], around 30 people had surrounded the NYSE. With their displays facing the public, they loaded the arOCCUPYWALLSTREET app and turned up their volume. Hundreds of people able to see and hear the #arOWS protest on that day (many of whom were NYSE workers) because of the high volume of foot traffic and timing.



**Fig. 1.11** #arOCCUPYWALLSTREET, *Augmented Reality Flash Mob at Wall Street*, AR flash mob in front of the NYSE (2011) (Images reproduced courtesy of the artist)

## 1.11 Augmented Reality Distributed Action

#arOCCUPY May Day was the occupation of the planet earth by AR activists from around the globe on May 1 (see Fig. 1.12). The event was part OWS's May Day general strike which called for people around the world not to show up for work and to participate in a global strike. AR activists performed a "distributed action" in which they collaborated from across the globe to occupy the earth with AR. The project was organized by an open call that was posted on public Web sites and forums across the Internet. Activists from around the world participated in creating work(s) related to OWS. The works were shared with all those participating and combined into a mass AR protest. The mass AR protest was distributed across the globe at the location of each participating activist as well as people from the general public who were willing to participate. On May 1, 2012, the AR activists and public were instructed to view and show the protest to others. As they did so, they were told to take pictures and video which they were to post to their social networks. The first images posted came from Australia and then Japan. As the day went on, excitement grew to see what country would be next and who could get the best image. Over 20 countries and 42 artists from around the world contributed to the effort. The event engaged the public on the ground as well as the social network.

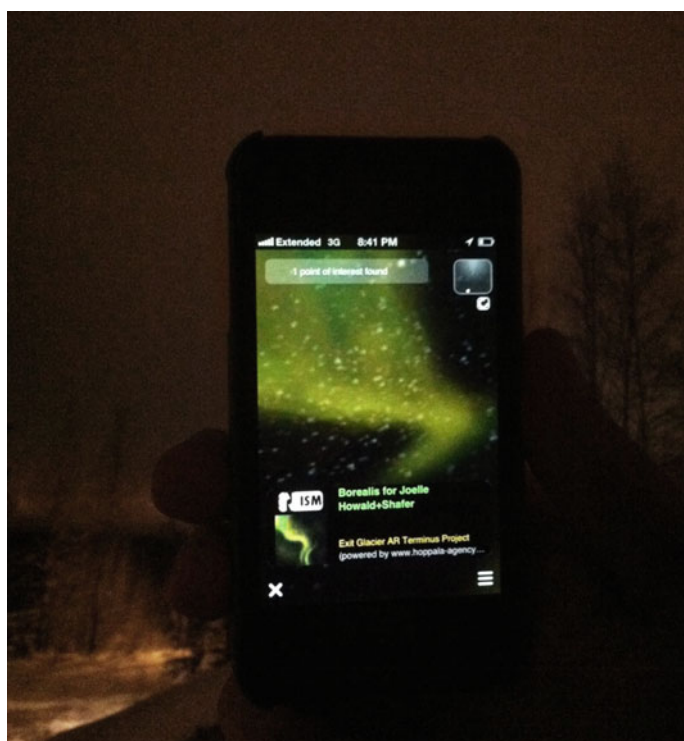


**Fig. 1.12** #arOCCUPY May Day, Switzerland [L] screenshot (Image reproduced courtesy of Lalie Schewadron), Tokyo, Japan [R] (Image reproduced courtesy of Yuichi Irimoto) screenshot (2012)

The #arOCCUPY May Day was organized in sync with the OWS's May Day Arts Council and Devotion Gallery located in Brooklyn, New York.

## 1.12 Augmented Reality Environmental Activism

Nathan Shafer was one of the first activists to work on environmental issues with AR. Shafer replaced parts of the environment that had disappeared during the last century with mobile AR. One of Shafer's first works addressing environmental loss was his work that brought back the aurora borealis to his hometown of Anchorage, Alaska (see Fig. 1.13). As part of the sun's cycle every 11 years it goes from a state of high activity to low activity. As it goes into the low activity cycle, it emits less highly energized particles into space. When the energized atoms collide with earth's atmosphere, they create the aurora borealis effect. In the low cycle, the aurora borealis moves north and is seen much less frequently (Bodzash 2010). Even when the sun was in a period of high activity and the aurora borealis is not visible in Anchorage because of manmade light pollution. This light pollution removes the aurora borealis from cities across the world.



**Fig. 1.13** Nathan Shafer, *Borealis* (2010) full view (Images reproduced courtesy of the artist)



**Fig. 1.14** Nathan Shafer, *Exit Glacier Terminus Project* (2012) screenshot (Images reproduced courtesy of the artist)

Another of Shafer's works addresses global warming and environmental degradation (see Fig. 1.14). This was seen in Alaska's rapidly receding glaciers. Shafer used AR to show on site, how the glacier had receded over recent years. Viewers have to travel to the site of the glaciers armed with a smartphone or tablet. Viewers can then see glaciers as they were years ago. The app allowed viewers to roll back time year by year to see global warming's devastating effect on what is left of the glaciers. Shafer's work shocks the viewer when confronted with the extent of the devastation. The amount of the damage brings on a sense of urgency bordering on hopelessness when the viewer is faced with Shafer's documentation.

Art activist John Craig Freeman's work "DéchARge de Rebut Toxique" <sup>12</sup> creates a sprawling radioactive toxic waste dump across the city of Paris, France. The work calls into question the world's reliance on nuclear energy and the consequences tied to long-term use (Freeman 2017a, b).

### 1.13 Augmented Reality Monuments

Author activist Gregory Ulmer writes of the need for modern monuments to reconcile the tragedies and horrors of today. Because we as a society experience these as a networked collective, there is a need for a modern-day monument which reflects this. In his book *Electronic Monuments*, Ulmer argues that this monument is needed for the 911 World Trade Center Disaster. Artist activist Brian August created this very monument for World Trade Center called 110 Stories.

August made an AR app that recreated the World Trade Center at the real-world site of ground zero in scale. The app allowed viewers to see the trade center from across the city of New York replacing its iconic silhouette in the Manhattan skyline. Then, August created an interface which allowed viewers to retell their memories of the Trade Center and leave them at the location where they had the memory. The work linked memories in time to physical locations throughout New York City with AR. The memories were stored in a collective database that the community could review from the app and Internet.

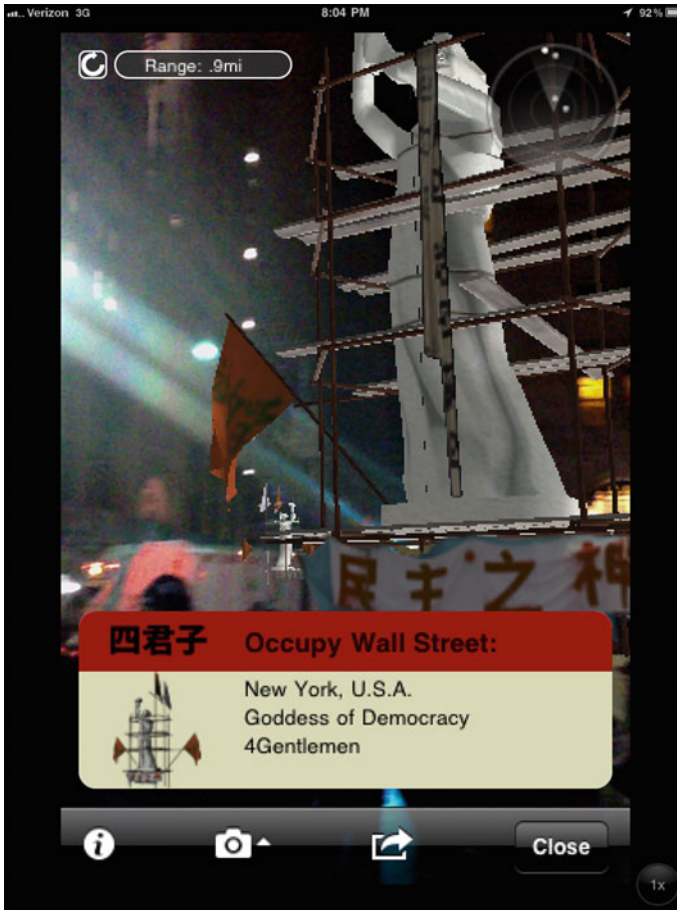
## 1.14 Extreme Augmented Reality Activism

Extreme AR activism is work that pushes the edge, where real danger is involved. The activist's message usually deals with controversial subject matter. These works are often executed in politically dangerous locations. Being caught making or viewing the work could result in fines, blacklisting, deportation, jail or worse. Some activists are willing to take these chances because this type of work usually has the best chance of creating actual change.

Work by the group "The 4 Gentleman" pushes these boundaries by creating works that could get the viewer jail time simply by being caught viewing the mobile app (Fig. 1.15). One work by the group, "Tiananmen Squared" recreates the Goddess of Democracy statue from the Tiananmen Square uprising in Tiananmen Square in Beijing, China. Anyone who is brave enough can travel to Tiananmen Square and view the work. Chinese college art students originally erected the Goddess of Democracy statue with chicken wire and plaster of Paris during the uprising. By simply searching for the term "Tiananmen Square" while in China, the searcher is red flagged and put under observation by Chinese cyber-police. Currently, AR is very low on most government's radars. The data being transmitted it is often overlooked by big brother. This will surely change along with escalating dangers associated with this type of work in the upcoming years.

The Apple Store Intervention with Foxconn Worker (shown at Eyebeam's Activist Tech Demo Day) can be classified as AR spectacle activism (Fig. 1.16). The Foxconn employee's lifeless body is seen contrasted against the polished glass atrium of the 14th street Apple Store with augmented reality. Foxconn, Apple's largest manufacturer, had a string of suicides—employees jumping from the roofs of the factory buildings. Eventually Foxconn, to protect its employees, was forced to install safety nets surrounding these buildings to dissuade would be jumpers. The work appropriated a shocking leaked image of one of the real-world Foxconn employees who had just committed suicide. The work creates a telepresence by mixing the realities Apple Store with the tragedy that took place at the Foxconn Plant. The lifeless Foxconn worker is surrounded by first responders and onlookers from the Foxconn plant. This is contrasted by the Apple store consumers who walk by the tragedy, unknowing and without care as they prepare to make their next Apple purchase. In a future iteration of the project, the app will be subversively





**Fig. 1.15** The 4 Gentleman, *Goddess of Democracy* (2011) screenshot (Images reproduced courtesy of Mark Skwarek)

installed on the Apple Store's floor model iPhones so that the unknowing consumers may accidentally experience the intervention while considering their next smartphone purchase.

## 1.15 Augmented Reality Communication and Creation

Another form of AR activism empowers the public itself with creative tools. These tools allow the public to make their own AR messages at specific geographic locations. These locations are often highly political or private corporate locations which are inaccessible to the general public. The app *infiltrAR* allowed people to





**Fig. 1.16** Mark Skwarek, *Apple Store Intervention with Foxconn Worker* (2012) screenshot (Images reproduced courtesy of the artist)

tweet messages directly into the US Presidential Oval Office via an AR hot air balloon (Fig. 1.17). If the President turns on the app, he will see the balloon floating around the office, delivering the last tweeted message. It is important to note that this message can only be seen at the White House. People using this type of app will see messages or creations made by other people. The activist's goal is to make the creation process simple enough that anyone with a smartphone can create and broadcast their messages with minimal effort. Creation software is made to democratize AR technology and empower the masses.

These AR mobile apps rely on the public to create the message or idea. This type of work is called crowdsourcing. They rely on the users to create the message. These projects are often popular because of the creative freedom it provides the public. The activists who make the software can never know or control what the public will create often leading to unexpected results.

The more successful creation apps generate strong metaphors, often giving the public power to remix known experiences from the real world. Skywrite by Will Pappenheimer allows the public to draw AR clouds in the sky with a smartphone or tablet (Fig. 1.18). A person using the app looks at the sky with their mobile device and draws on its display with their finger. As they do so, a cloud appears and the sound of an airplane can be heard. Skywrite could be used in a countless number of ways from art creation to love letters. Pappenheimer creates context to the work by

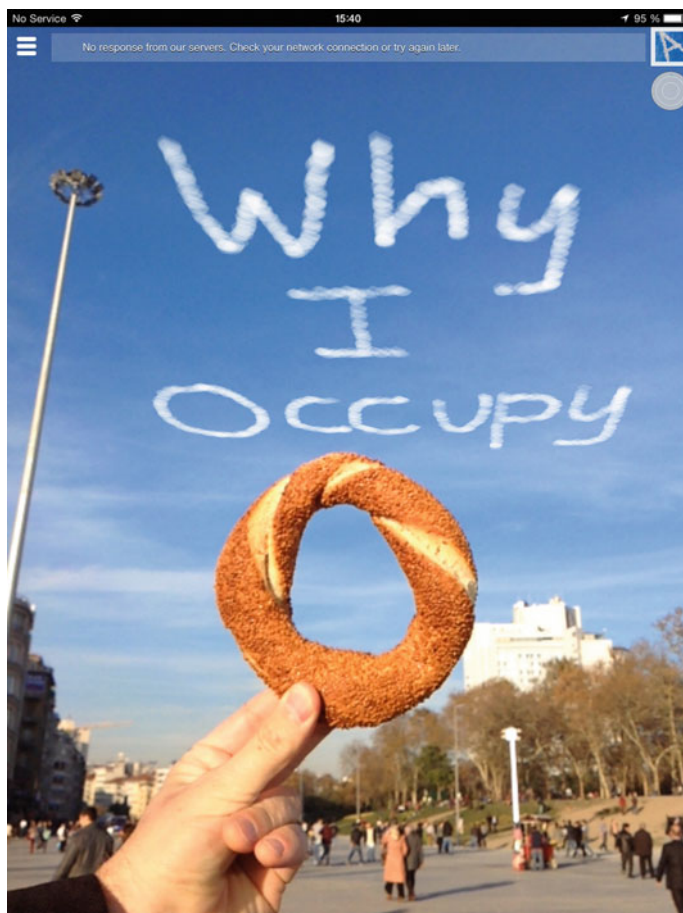


**Fig. 1.17** Sander Veenhof and Mark Skwarek, InfiltrAR, AR balloon sends tweets to the oval office (2012) screenshot (Images reproduced courtesy of the artist)

choosing specific locations that people can create messages above. On a number of occasions, Skywrite has been placed over political and corporate locations such as the US White House, the US Capitol Building, and Apple and Facebook’s headquarters. The placement of the experience turns most average citizens into activists when asked to draw something above a strategic government building such as the White House.

## 1.16 Negative Aspects of Augmented Reality

As with every new technology, there has been a backlash against the use of AR for activist purposes. A recurring point of contention is that the technology masks the evils of the world and that it detaches society from reality. “Against those who claim that augmented reality is the future of activism, we need only say: Everyone may wear blinders but the world will still stink of decay” (White 2010). The activist response to White is that we never set out to mask the stink and decay of the world;



**Fig. 1.18** Will Pappenheimer, *Skywrite*, create AR messages with clouds (2012) (Images reproduced courtesy of the artist)

instead, we set out to expose it and bring people out of their homes, to it. AR has the power to reveal the unseen. White misunderstands the technology. Ironically, White's blog text alienates the public from themselves and the real world their monitors. The act of creating a dialogue which solely exists in a net-based format only fuels societies' detachment from reality. The time spent reading is time taken from the real world. Instead, we (AR activists) set out to expose the real world and all its faults to new audiences who are trapped behind White's computer monitor and reveal to them the unseen horrors of the physical. AR can make digital activism engage the physical world. AR can heighten the public's understanding of their physical surroundings making them more in touch with the world around them. We live in a day and age where startling numbers of people communicate more and more through social media such as Facebook and Twitter. AR activists should turn

these technologies into face-to-face experiences that take place in the real world. The goal of future activists working with AR should be to liberate the masses from their computers and get them excited and engaged in the real world by talking to each other! Not all having the same app or fancy smartphone, but using app to generate discussion and community.

Other critics of the technology dislike AR as a tool for activism because they say it is a “safe” medium that is created from behind a monitor and keyboard. They see this technology creating a generation of armchair activists, protesting from the comfort of their homes completely detached from the physical yet complacently satisfied they have fulfilled their obligation in the fight for social justice. Creating a generation of activists who show up at the protest as virtual avatars with digital protest signs made up of one’s and zero’s. “[AR] absolves ‘participants’ of some of the basic requirements of a traditional protest [like] showing up, getting hassled [and] offering oneself for arrest,”—Carl Skelton (2012).

Skelton’s fears are grounded in the writing of the Situationists and Guy Debord. “All that once was directly lived has become mere representation.” The spectacle is the inverted image of society in which relations between commodities have supplanted relations between people, in which “passive identification with the spectacle supplants genuine activity.” “The spectacle is not a collection of images,” Debord writes, “rather, it is a social relationship between people that is mediated by images.” Guy Debord (Debord and Nicholson-Smith 1967/1994)

These critics bring up important issues but misunderstand AR as a medium. People have to travel to specific locations to experience almost all current AR activism whether the work is rooted in gravitas or humor. The site-specific quality of AR allows it to leverage a new untapped demographic of potential protesters. These could be tech savvy people who disagree with the state of national policies but are not quite motivated enough to go to the protests. The lure of AR could be the carrot that could motivate these people into making the effort to travel to a protest. Once there they would meet the like-minded people and hopefully become more involved. In this sense, AR has the ability to help build the movement’s numbers. Both White and Skelton make very important arguments that future activists working with AR should consider carefully. Some future works will undoubtedly fit the mold that White and Skelton’s have predicted. Activists should work to see that these predictions do not come true.

Another argument against the use of AR for activism is that it is a technology of the elite. They say it requires an expensive device and normally a yearlong contract. When smartphones first became available to the public, this was the case but the industry has their eyes on the untapped global market. This market is not in developed countries but instead in third world nation-states. “The big opportunity is in how we put smartphones into the hands of the next billion,” says Dan Appelquist, Open Web Advocate at Telefónica Digital. “And we do not believe that the situation we currently see with smartphones in developed markets will necessarily be replicated as this happens” (Carter 2013).

The first cell phones appear ridiculous to us now. They were unwieldy and completely unrealistic for the general public. The upfront costs to develop for an AR mobile device have previously kept many activists out of development.

Finally, the vast majority of the general public simply has no idea what AR is.

Lack of knowledge and understanding of the software separates not only the activist creator but also the public from the experience. The transition from smartphones to glasses will usher in exponential growth in the public's understanding of the technology. The general public who is bombarded with content everyday filters AR out.

## 1.17 The Next Generation of Activist Work

### 1.17.1 *Multi-user Networked Experiences and Telepresence for AR Activism*

Augmented reality as a medium has come a long way since the first text for this chapter was written. The original projects written about in this chapter showed how AR allows activists to create works that engage the public in ways never done before. Today, a new set of tools has emerged, allowing activists to create the next-generation activist works. At the same time, the geopolitical landscape has worsened and with it the problems facing the activist.

Mikhail Gorbachev, the former leader of the Soviet Union, was recently interviewed in Time Magazine in December 2016. In the interview, he made a startling statement,

It All Looks as if the World Is Preparing for War. (Gorbachev 2017)

More and more countries with radically opposing views are obtaining weapons of mass destruction (WMDs). Soon, countries and groups of people who want WMDs badly enough will have them. With so many groups of people living so closely and now having WMDs. A nuclear world war would end life as we know it and potentially send our global society back into the dark ages. The world is becoming a smaller place by the day and ideas, and cultures are being forced closer and closer together. The weapons capable of causing mass destruction have become smaller, more powerful, and accessible. Diplomacy with the iron fist no longer seems like an option.

Many of the early AR activist works received considerable press and public attention, but the important question remains... Did these actions actually create change for the greater good? Can AR do more than draw attention to a problem?

*Activism*

Noun

the policy or action of using vigorous campaigning to bring about political or social change (Oxford Living Dictionaries 2017).



The next-generation mobile hardware and software bring a new and unique set of tools for the activist that allow them to engage the public's senses on a deeper level than ever before. Through multi-user, networked experiences people from opposite sides of the world can meet and interact with one another as though they are standing in the same room, thanks to augmented and virtual reality. This shared and embodied experience allows the activist to create possible to.

### ***1.17.2 The Empathy Machine***

One of the most exciting possibilities of AR and VR is as “empathy machines.” Empathy machines are technologies that can allow us to understand and relate to people whose conditions are often worse than our own. We can relive world events and experience other's social conditions in Realtime 3D. Viewers can experience the suffering of others from half a world away, in Realtime. 360 VR has turned out to be a fairly immersive experience that is a cost-effective way to easily reach the general public. It works on almost any smartphone, so accessibility is a very large audience. By wearing a Google Cardboard, the viewer can see a 360-degree video recording or real-time stream of the world.

In January 2015, the movie company Vrse created the film *Clouds Over Sidra* (see Fig. 1.19). The film was the first 360 VR film shot for the United Nations. The film was the heartbreaking story of a 12-year-old Syrian girl growing up at the Za'atari camp in Jordan. The 12-year-old narrates everyday existence, trying to survive in the field. The work is credited with helping raise 3.8 billion dollars in an UN fund raising effort (United Nations Virtual Reality 2016). *Clouds Over Sidra* was the first VR movie shot for the UN and is seen as one of the first major activist works for 360 VR.



**Fig. 1.19** Gabo Arora, Chris Milk, *Clouds Over Sidra* (2016) 360 VR (Images reproduced courtesy of the artist)





**Fig. 1.20** Virtual Human Interaction Lab, *Empathy at Scale* (2015) VR full view (Images reproduced courtesy of the artist)

Very little, if no work, has been done with multi-user, AR experiences to build empathy for others. Past works that use virtual reality to create empathy have been done, but the approach has been mainly through a singular user experience.

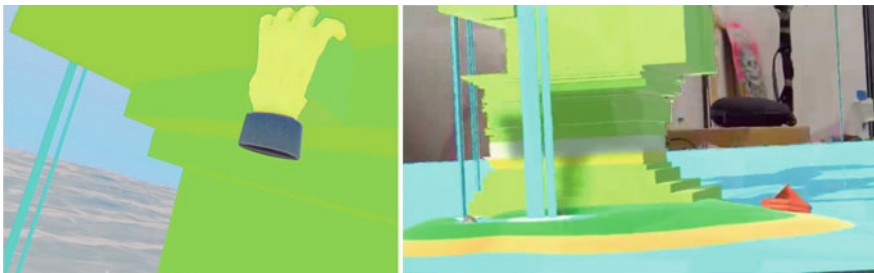
*Empathy at Scale*, by Stanford University's Virtual Human Interaction Lab, is a VR experience that allows the public to live in someone else's skin (Fig. 1.20). In the VR experience, the participant sees that their skin color along with the race has been changed. The participant experiences what it is like to "walking a mile" in someone else's shoes from a first-person perspective. They see and hear the conditions that the other person lives in. They can feel how other people treat them. The user can experience bullying, prejudice, and injustice.

Augmented and virtual reality gives activists the ability to create a bridge between cultures and ideas. Multi-user networked experiences are now possible at a consumer grade. We can bring all types of people from across the globe into the same room. At the same time, artists must take great care when pointing out others groups and culture's shortcomings. Creating provocative work can gain much media attention, but can also escalate tension between cultures and widen the cultural divide. Watching the news in recent years, we have seen relationships between world powers getting worse and worse. An activist project that takes a lot of public attention by one society can easily be misinterpreted by another society.

Past VR projects, such as *Snow World* by the Human Interface Technology Laboratory at the University of Washington, have shown that VR can significantly reduce pain in severe burn victims (Fig. 1.21). A study by the Department of Communication at Stanford University showed that children remembered VR experiences as though they were real-world events that they had participated in. Developers are only beginning to unlock the true power of VR and AR. Augmented and virtual reality will very soon give activists, artists, and developers the ability to create anything. They will be able to recreate reality and bend the laws of physics.



**Fig. 1.21** Human Interface Technology Laboratory, Snow World (2003) hardware view (Images reproduced courtesy of the artist)



**Fig. 1.22** Mobile AR Lab @ NYU, AR VR for Peace Project (2016) HoloLens view (Images reproduced courtesy of the artist)

With the power to create “anything,” activists can do anything! The most important thing to build is respect for one another and with it world peace.

The AR VR for Peace Project takes two people who hate each other and brings them together with AR and VR (Fig. 1.22). The project is an ongoing psychology study in advanced multi-user human interaction. There is no one right answer to the problem of hate and misunderstanding, so the project will come up with multiple solutions specific to the different roots of hate. The end goal of the project was to reduce tension and stress, to leave the participants with a greater level of respect and understanding for one another. The goal of the project is to create a bridge between cultures and ideologies with AR and VR.



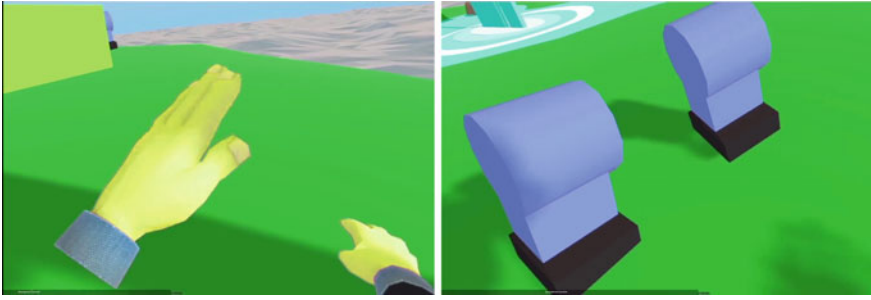
**Fig. 1.23** Mobile AR Lab @ NYU, AR VR for Peace Project (2016) HoloLens user experience (Images reproduced courtesy of the artist)

The participants, who could be on opposite sides of the planet, can see and interact with each other as though they are in the same room (see Fig. 1.23). Being remotely present at a different location other than where the user currently is located is known as telepresence. Telepresence will have a radical impact on the way the global public communicates and understands one another. Activists are now able to bring people together who are separated by distance, rivers, walls, deserts, oceans, and political and economic forces. The HoloLens [AR], VIVE [VR], and Oculus Rift [VR] can all create these networked, multi-user telepresence experiences.

Such a powerful technology is a double-edged sword. A danger of this telepresence is that it can create a culture of “armchair activists” (Chen 2012). A public, who views disasters as immersive entertainment, is numb to reality. A culture of AR and VR “disaster tourism” could evolve where the public experiences the world through from their home, seen through a LCD. Sadly, this culture somewhat already exists in America, with people spending over 10 h a day looking at digital screens (Howard 2016). It is imperative that activists harness AR and VR with the goal to create social change for the greater good. The experiences activists create need not only to entertain, but must compel the viewer to action.

### **1.17.3 User Experience**

The first experience for the AR VR for Peace Project was an experience where two people find themselves trapped on a deserted island. They were forced to work

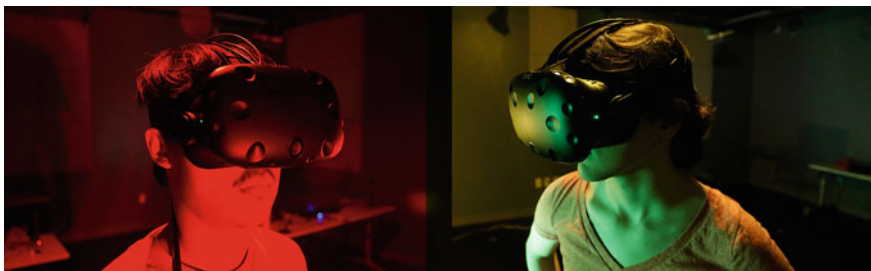


**Fig. 1.24** Mobile AR Lab @ NYU, AR VR for Peace Project (2016) VIVE in-game user experience (Images reproduced courtesy of the artist)

together to survive. When the experience starts, the real-world floor disappears, covered by digital sand and a virtual island materializes under their feet. They wake up in a life raft which has washed ashore on a deserted island with a sinking ship in the distance. Strangely, they find that they only inhabit half of an avatar's body. The participant who becomes the upper half of the body finds themselves lying on the ground. The participant's experience at two different real-world locations. For the AR experience, they both wear the HoloLens augmented reality headset. One participant wears markers on their hands, and the other participant wears them on their feet. The markers allow the participant's feet and hands to be tracked. The tracking allows the participant to interact with the virtual environment (see Fig. 1.24).

They can only drag themselves along the ground with their hands, thanks to the tracking markers. The second participant only inhabits the lower torso, legs, and feet. They can walk, but have no body, arms, or head. Even though they do not have a head, they see the world in a first-person perspective, from where the avatar's head would be. The participant's view seems as though they are floating above a set of legs.

Soon after awakening, the participant's problems get worse. The ocean's tide begins rising, and the island's beach starts to disappear. The only chance to survive is to climb the mountain at the center of the island. There is one more problem they face. As they try to climb, they make some progress but soon come to an impasse that they just cannot overcome on their own. Alone, the participants are destined to fail and drown in the rising tides. The only way to make it up the mountain and to safety is if they combine into a complete avatar. The upper torso can lift themselves on top of the lower body, and they will unite creating a complete avatar. Only now can the two participants scale the mountain wall to safety. The task is not easy and requires the two participants to work in sync to make it past the obstacles and survive the rising water. Some obstacles require the operator of the lower half of the torso to physically jump while the upper half must grab the ledge at precisely the right moment. The user's experience is intentionally very physical. The interactions, such as climbing and jumping, are meant to be as close to the real-world



**Fig. 1.25** Mobile AR Lab @ NYU, AR VR for Peace Project (2016) VIVE user experience (Images reproduced courtesy of the artist)

action as possible. The interaction is intentionally designed to be challenging and can only be accomplished when both people work in sync. This is unlike like the traditional video game experience, where players can make it to safety by passively pushing buttons.

Both AR and VR versions of the project were built. Each had pros and cons. The VR version was more immersive, higher resolution, and user interaction was more fluid. This was because the VR version was tethered to a dedicated gaming PC which allowed it to render much higher resolution graphics than the HoloLens. Wearing the VR headset blocked out the user's view of the real world, completely immersing the user in the VR simulated world (Fig. 1.25). Also, the VR controllers gave the users a slightly better experience when interacting with objects in the virtual world, heightening the sense of immersion. The major downside to the VR version was the tethering of the headset to the gaming PC. The cable was dangerous because of the danger of tripping. This required a project worker to constantly watch the participant while they were in the experience. The hardware for the VR experience was heavier and more obtrusive. The VR also took a longer time to set up and prepare.

The AR version of the project was simpler to set up. No external PC was needed. All computations were done locally on the HoloLens. The biggest advantage of the HoloLens was that it was not tethered and the participants were able to freely move around larger spaces than the VR iteration unencumbered. Not being tied to a PC allowed for more freedom when designing the environment. The biggest drawback was the HoloLens's small field of view. The HoloLens was only able to generate a medium-sized display window for AR in front of the viewer's eyes. If the participant looked to the right or left of the window, they would no longer see augmentation. This would somewhat ruin the user's immersion. Also, the participant had to look at the part of the environment they wanted to interact with for the hand and feet trackers to work.

### ***1.17.4 Considerations and Problems***

The challenges facing the development of the project faced were numerous. Creating a change in the user's subconscious was no easy task, and many different approaches were considered. To do this, an interaction strategy had to be devised. Would the experience be active or passive? Would they be able to communicate? If so, how would they communicate? How would the people see each other? Should the users be able to interact or should their experience be passive as an observer?

The reasoning for turning the interaction into physical play was to overload the participants with goals so to remove them from their daily and past lives. This was to temporarily break the metal link to the root of their anger and hatred. Combined mental and physical focus, synced with the other participant, was required to make it through the experience. The user's experience and interactions were carefully designed to promote cooperation and goodwill between the players. The user's experience was supposed to be neutral and not linked to any cultural metaphors so not to trigger the user's preconceptions. The design of the avatar, the environment, and user's interactions were given much consideration so that it would not taint the experience.

### ***1.17.5 Test Subjects***

Choosing test subjects for the project was a complex task. Taking people who hate each other and putting them in direct contact with one another can be dangerous even if they are in different physical locations. The possibility that experience might heighten animosity was a serious concern. Knowing that small miscalculations could lead to dangerous results when placing different radical groups together, careful thought and testing took place. The strategy needed to take into account the conflict that the project was trying to resolve.

For the first user testing, ten applicants were chosen as potential test subjects. They were told it was multi-user VR playtesting. The reasoning behind the experience in the initial interview. The development team knew in advance that some of the participants had ongoing conflicts with other members in the pool. They were asked seemingly random questions about video games, how much did they play, what types of games they played, had they experienced AR or VR gameplay, what kinds of environments where they're favorite. What conditions created a state of tranquility and which created rage. What types of people did they like to play with? Why they liked to play with these people. They were then asked about the pool of applicants. Their general impression of the other members. If they had any previous interactions.

Interviews were conducted with the two participants, and their conflicts were given a grade determined by the level of animosity. The idea was to start with small problems and scale up to significant problems. We would first work with people



who disliked each other, then move up to people who were angry at one another, and then finally work with people who hated each other.

Test subjects who disliked each other rather than people who hated each other were chosen for the first iteration of the project. For player interaction, an active experience was chosen to allow the players to see and interact with each other. It was decided not to allow the players to communicate aside from visual signals they could send each other with their avatars. Oral and other forms of communication with sound were seen as additional variables, so they were cut from the first iteration of the project.

### ***1.17.6 Outcome***

The first iteration of AR VR for Peace Project was largely successful. The test subjects (80%) felt “closer” to the person they had interacted with after completing the experience. The results were overwhelmingly positive across all age groups. The greatest attitude shift happened largely around the gameplay and with people who were competitive. The user’s engagement grew dramatically as the players came up against more challenging obstacles that required the users to work together. Most users [90%] would fail on the first obstacle, but by timing their actions, all groups were able to overcome the first set of obstacles.

The problems the users faced mainly involved learning the interface, so they could interact with the virtual environment. Interacting with the environment with the AR markers had a longer learning curve than the VR hand controls. The small field of view on the HoloLens was an issue for most of the participants.

Because there was no audio, some of the users began communicating with gestures. Tapping or waving movements with the hand or foot controllers was the most common form of communication. The majority of participants said that the lack of communication made the experience more challenging.

The test results from the AR VR for Peace Project support the idea that AR and VR can create empathy in users. The ability to overcome a challenging obstacle, which was seemingly impossible, created a bond between users and a shared sense of mental satisfaction. Even with the problems the project faced, the possibility that this technology can create change for the greater good cannot be ignored in the current political climate.

The AR VR for Peace Project was created by NYU’s Tandon School of Engineering’s Mobile AR Lab in December 2016. The project team was made up of Mark Skwarek, Siyuan Qui, Mayukh Goswami, James P. Lewis, Yao Chen, and John Pasquarello. The next iteration of the project is an international effort including NYU Tandon School of Engineering in Brooklyn, NY, High Institute of Multimedia arts at Mannouba University in Tunisia, NYU Shanghai, and Northwestern Polytechnical University in China. The project will have created networked, multi-user experiences with the goal of creating world peace.

We live in a day and age where geopolitical tensions have come to the point that the USA and North Korea are on the brink of nuclear war which would most likely turn into a world war. On the day this was written, North Korea seems to have tested a hydrogen bomb that they say can be loaded onto an intercontinental ballistic missile capable of hitting the USA (Berlinger and Taehoon Lee 2017). A conflict of this sort will leave countless dead and most likely draw other countries in, becoming a world war. This is not acceptable, and the global community, including activists, needs to do everything it can to stop it. Activism is about creating change for the greater good, not getting famous. Activists working with AR and VR need to step back and think about the end result of their work. If the work they are making will only equal news stories, what good is the work really doing? AR multi-user interactions have great potential to do this, but are certainly not the only technology that can. New tools are becoming available for AR and VR creation on a daily basis. Many of these tools hold unknown potential, possibly the potential to create world peace. It is the activist's job to rise up to save the world, and AR and VR might hold the key that let them do it!

## 1.18 Dangers Facing the Digital Activist

The dangers facing AR activists have changed along with the technologies they use. In the past, activists had to worry about being caught in the real world. This included being recorded by a surveillance camera, being infiltrated by undercover agents, entrapment, charges of destruction of property, and vandalism to name a few. Today police cars can automatically scan each car's license plate, and security cameras make use of facial recognition algorithms to determine who you are and then search your online profile automatically for any wrongdoing. The tools of science fiction are becoming real, and they are in the hands of the political and financial elite. For those working with AR, the simple act of viewing an augment can leave a digital fingerprint that points straight back to you. In January 2014, the Ukrainian government used protester's cell phones to determine which people were near a protest and sent them a text message saying, "Dear subscriber, you are registered as a participant in a mass disturbance." A new Ukrainian law makes participating in a protest the same offense as a violent crime, punishable by imprisonment (Kramer 2014).

The technological infrastructure that our society now relies on is a system that can be easily monitored and recorded by the US intelligence organizations (NSA, CSS, NRO, etc.) and many other nation-states around the world. Edward Snowden made the dark side our technology painfully clear. The utopia we came to believe in was actually under the close eye of big brother in most likely the largest case of surveillance in the history of mankind. The US government was able to force corporate giants like Google, Facebook, Apple, AT&T, and Verizon to give access to their systems and their customer's private information (Savage et al. 2013).

This surveillance directly affects activists working with mobile AR because the infrastructure it is built on top of, in most cases, relies on corporations such as AT&T and Verizon. Activists working with any of these major providers should assume their data is being monitored by the NSA and possibly other entities. Because AR is a new technology, it largely falls off the elite's radar. But that will change in the near future as AR becomes more commonplace. When activist actions affect the political and corporation's wealth and power, they will crack down. That time is coming soon. Juniper Research says that between 2012 and 2017 AR sales will grow from \$82 million to 5.2 billion (Johnson 2012).

With all of these variables facing the AR activist what options are left to create work that will have a real impact on society? This type of work will undoubtedly involve risk. Ways to minimize this risk would start with the foundation upon which the activist builds. This foundation is made up of the networks which the activist message is broadcast across. Activist sites like WikiLeaks use The Onion Router (TOR) to anonymize their communications with their users. There is other similar software such as Free Net that allows users to browse the net, chat, publish, and share files anonymously. There is always a trade-off to anonymity this software provides. Currently small numbers of people use this encryption software, and when they do so, it is usually for a reason. Because of the small numbers of people, it is easy for government agencies and other interested parties to spot them out of the billions of daily communications.

## 1.19 The Future

What can AR of the future do to aid activists and create real social change? Streaming real-time information visualizations to activists and the public has great potential to aid activists, inform the public, and create change. Modern-day activist heroes Edward Snowden and Julian Assange's whistle-blowing is seen by many as leading the way for modern-day activists. A powerful use for future AR activists would be mixing Snowden's information with Anonymous's hacktivism to create a real-time AR visualization of corruption and injustice. Not just the idea of being spied upon but being able to see it as it's happening. This would take Snowden's revelations to another level. Groups like Anonymous could hack live data streams of the political and corporate elite's wrongdoing and turned them into real-time AR visualizations that could be seen around the world. An example is the prototype The Protester's Survival App which was developed during the OWS movement. The work was made in reaction to the H.R. 347 bill and the Trespass Bill of 2011. They stated that if certain locations were entered by protesters, they could receive a 10-year jail sentence. The problem was these locations were invisible and could move without warning. Being at the wrong place at the wrong time could equal a long jail sentence. The Protester's Survival App and AR made these locations visible. This type of application not only keeps activists out of jail but it saves taxpayers a costly legal process.

Another area that shows great promise for AR as a tool for activism is the further development of AR creation apps (discussed in 1.15). AR creation apps democratize AR by giving the public a tool which they can use to create their own message or idea. Allowing the public to create “anything” with very little effort is the ideal for crowdsourcing. Harnessing the combined creative power of the public is a very powerful thing allowing an activist to create incredible amounts of work that one person could not possibly do on their own. The collective consciousness of the public makes it possible to generate a wide range of ideas allowing the group’s overall message to stay fresh, unique, and unexpected. An example app is CreatAR15 that allows people to make anything with AR anywhere simply by downloading the app and asking for it. People can create and edit whatever they want wherever they want as well as upload their own creations.

In the future, activists will be able to record and leave historical events where they happened in HD 3D along with sound. They will have the ability to fast forward and rewind time on site and share it instantly around the world. This will be just one of many consumer grade tools available to the future activist. The science fiction of today is quickly becoming the freeware of tomorrow. Activists need to be ready to utilize this technology as it becomes available.

## 1.20 Closing

Where does the activist’s responsibility lie? At what point is he or she to be held accountable when something goes wrong? Difficult questions face activists working with AR. Being able to view the work anywhere by a rapidly growing population can be a danger. Creating works in locations which could jeopardize the safety of the person(s) viewing the work has become very very easy. This can be done with a great degree of anonymity and literally a few clicks. To achieve the same result in the real-world, activists normally do extensive planning and could be risking their own lives. The creators of activist work must be held accountable for their actions. The AR of tomorrow will be considerably more powerful, easily accessible to a much larger population, and if abused more dangerous.

AR is a very young technology that has a real chance to change the world. The ability to overlay reality with the virtual is a Pandora’s box that will certainly be used by both sides. It has an uncertain future and development will be largely driven by commercial interests.

Until AR is able to create actual social change it will continue be attacked by naysayers like Micah White. People are just beginning to figure out what makes AR a unique technology. It offers the activist one of the most powerful tools of expression available. As AR rapidly evolves, it will quickly become more useful. Activists should carefully consider the work they will make and its desired impact on society. How will their work reach the public and who are they trying to affect? What are the long-term implications and possible outcomes, right or wrong? The future AR activist’s goal should be to create work that mobilizes people, liberating

them from their digital screen-based realities making a stronger community and creating real social change.

Alice has stepped through the looking glass, and we are not turning back. Emerging mobile technologies such as the smartphone and Google Glass are here to stay. Many will use these technologies in ways that can isolate and fracture society. It is the job all future artists and activists to use this technology for the better, to bring people together, and uproot social injustice.

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