HEREWEART: CHILDREN'S CIVIC ENGAGEMENT THROUGH AUGMENTED REALITY PLACEMAKING

Authors:
DAVID HARRIS SMITH, HAROLD SIKKEMA, DAVEN BIGELOW, CALVIN HILLIS, BRIAN DETLOR, MAUREEN HUPFER

Affiliation:
MCMASTER UNIVERSITY, CANADA

INTRODUCTION

HereWeArt is a smartphone app that combines Augmented Reality (AR) technologies and geolocation to position the artworks of children and youth as a site-specific public art exhibition.[1] As an exhibit, *HereWeArt* visualizes child-like wonder through art. As an AR placemaking project *HereWeArt* also raises questions around collaboration, youth civic engagement, and sustainability in digital artwork. With reference to the notion of placemaking this project considers how AR and geolocation amplify children's voices in civic engagement.[2] Geo-located AR art as a placemaking project amplifies the social and cultural contexts of a place. Engaging children in the initial creative process has important implications for cognitive development related to learning, creativity, and civic engagement. *HereWeArt* makes the most of these opportunities by involving children in civic engagement through inclusion of their creative artwork into a placemaking project. This paper offers a self-reflexive account of the development, production, and deployment of *HereWeArt* at an urban art festival. We find that including children's voices in an AR placemaking project provides a variety of empowering narratives: initialization of youth civic engagement, raising agency of young people, developing new associations with mobile devices, and new approaches to sustainable placemaking. In the age of ubiquitous mobile computing, these reflections open up the possibilities of AR for application in a variety of civic and social engagements.

BACKGROUND

Responding to the growth of Augmented Reality (AR) technologies, and leveraging the increased accessibility of AR, artists and researchers have explored various permutations and intersections of the medium. Research of AR in educational contexts demonstrate significant pedagogical value. Introducing AR to education settings has produced consistent trends: increased student motivation, learning gains, creative thinking, and collaborative relationships between students.[3] Other research has explored the impacts of AR in new media, sociology, and contemporary art practices.[4] AR has been found to enhance the social meanings of a space.[5] Nancy Baker Cahill's art application *4th Wall,*[6] Christo and Jeanne Claude's *London Mastaba,*[7] CH2's *unattendedVapourware,*[8] and John Craig Freeman's *Frontera de los Muertos,*[9] are examples of artworks that combine AR with geolocation in this way to produce a meaningful effect. The site-specific aspect of these AR projects leverage the power of a space to contextualize the issues they address. When AR is integrated into an environment

the medium uniquely highlights the social meanings associated with that space. The potential to leverage these intersecting applications of AR to engage children in placemaking efforts deserves further exploration.

Engaging community in creative placemaking efforts provide opportunities to increase local civic engagement. Broadly speaking, community oriented placemaking can be referred to as a "culturalization of space".[10] Placemaking developments can reflect the diverse range of local identities and are thus a starting place to raise awareness of, and subsequently remedy social inequalities.[11] Local collaboration for enhancing a space strengthens the social networks of that place, raising the community members' self-perceptions of self-esteem and agency.[12] Placemaking projects bring communities together by combining the collaborative cultures of that place.

We have seen a few projects that involve children in placemaking. Researchers used a social network interface to connect children's ideas with an urban planning council and found that this improved children's civic engagement.[13] Other research projects that utilize new media platforms to involve children in local urban planning found that children civic participation through media raised their agency and notions of civic engagement.[14] In this context we see many benefits to involving communities in creative placemaking.

There has been a plethora of research that connects creative activity in children to their cognitive development. Piaget suggests that children learn best through participation.[15] *HereWeArt* is focused on play, exploration and participatory civic engagement. Play is an essential component to the development of a culturally rich child.[16] Creative and playful self-expression in education affirms an individual's sense of identity.[17] Creative exploration engages children in possibility thinking, provoking the mind to re-imagine the world from "what is" to "what might be".[18] Possibility thinking can also lead an individual to better understand and accept cultural differences.[19] This shows us that participation and creativity are both vital to expanding a child's world view.

PROJECT DESCRIPTION

HereWeArt leverages the potential for community participatory enhancement of a place. Located at York Boulevard in the Canadian city of Hamilton, *HereWeArt* is a smartphone app that combines AR and geolocation to position the artworks of children and youth as a site-specific public art exhibition. The project resists an authoritarian urban developmental position. Instead, it unobtrusively invites community members to participate in a locally developed environment. Involving the community in the creation of a space, with reference to "placemaking" *HereWeArt* considers how AR and geolocation amplify children's voices in civic engagement. The app utilizes AR to represent an art installation created by children. *HereWeArt* invites viewers to consider the role of children in civic collaboration by foregrounding children's creative visions of their neighborhoods. It places children's art quite literally above us. The *HereWeArt* mobile app was developed in the context of Artasia, a summer arts program by Culture for Kids in the Arts, the charitable arm of the Hamilton Conservatory for the Arts. For this project the app was deployed at Hamilton, Ontario's Supercrawl event, an annual city-wide art exhibition, in 2018.

Figure 1. Through the #HereWeArt app, children's artwork appears in augmented reality on York Boulevard, in the city of Hamilton, Canada. (Graphic: Harold Sikkema)

Figure 2. #HereWeArt lamp post icons used to signal augmented reality display locations. (Photo: Harold Sikkema)

HereWeArt was geo-located at the annual SuperCrawl festival, an event that brings the region's population together. Leveraging the communal power of this site, *HereWeArt* seizes upon the metaphoric narrative of illuminating a neighborhood through the image of a streetlamp. Through the app each lamppost becomes a portal to a neighborhood-oriented art gallery full of local children's creations. Geolocation is thus integral to the interface of *HereWeArt*, but also to its narrative.

Figure 3. Storybox examples featuring the work of young artists in augmented reality.

Through *HereWeArt* Children's art is digitized, projected onto a 3D Cube, and made into an AR asset that we call a "storybox". These storyboxes are prompted through street lamp posts. We have derived this idea of storyboxes from the notion of a skybox in 3D gaming and virtual environments, elevated 3D volumes that are used to display virtual content.
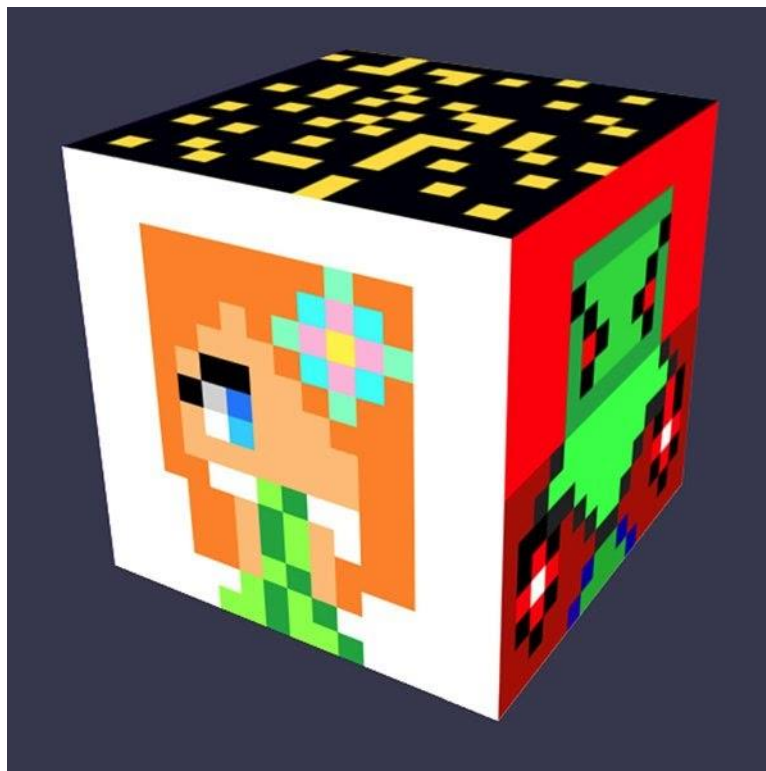

Figure 4. Storybox asset featuring children's pixel art.

We might consider *HereWeArt* as a mere display technology, but this would sidestep the embedded developmental context of the project. The Artasia camp emphasizes giving children a voice. Initially for this project, children were given black and white photos of neighbourhoods. They were then

prompted to draw in response to the question "What would you like to see in your neighborhood?". The resulting creativity served as our content bank. We think about the whole of *HereWeArt* as its own kind of artwork, while at the same time we present *HereWeArt* as a platform to host the children's artworks.

Figure 5. Artasia's integrated tactile and digital workflow culminate in the HereWeArt Augmented Reality exhibition (Photos: Harold Sikkema)

In *HereWeArt*, each lamppost plays host to a weatherproof graphic place marker in the mode of Aram Barthol's *Map*.[20] These markers provide a link to the *HereWeArt* app. The lamppost beckons users through a portal, on the other side of which lives an AR layer containing artworks. In fact, a full gallery space awaits: a digital space with as much wall-space as might be desired by the vigorous and creative minds of children.

Figure 6. Lamppost augmented by children's sculptural place-marker and graphic weatherproof sticker with link to AR content. (Photos: Harold Sikkema)

The "gallery" employed in *HereWeArt* takes the form of our above noted storybox. Storyboxes are also viewable online at the Culture for Kids in the Arts website.[21] Thus situated, the artworks enjoy a multimodal presence on the street and in web browsers. In both environments the artworks are viewable from inside and out. The floating cube expands the four walls of the gallery to the six sides of a cube. We describe this as the gallery becoming art, and the art itself is now a gallery. Through this utilization of public space *HereWeArt* can be considered as "post-gallery".[22] We find that the virtualization of the gallery, and the movement of the art gallery into the street, places *HereWeArt* within a larger discussion of democratization of knowledge, and the deconstruction and reinvention of public institutions that is common to postmodern life.
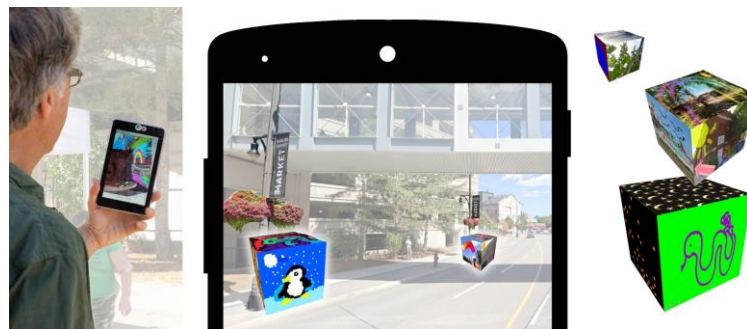
Figure 7. Viewers encounter storyboxes in augmented reality. (Photos: Harold Sikkema)

The Storyboxes in *HereWeArt* present a range of mixed media content, which gives rise to considerations around media hybridity. As we have discussed some of the artworks in *HereWeArt* are produced by children in tablet apps and thus are natively digital, while other pieces have been digitized "in post", following a more traditional hands-on community arts practice. In our background research we have seen many examples of native digital AR content, however we did not find many uses of analog works embedded in AR. *HereWeArt* takes this approach of projecting 2D analog works onto a 3D digital object. We want to situate this as an example of a hybrid modality, which also provokes further inquiry into a wider spectrum of modalities that are possible in this AR domain.

Documentation of App building Process

The design requirements for the *HereWeArt* app responded to the anticipated user experience of urban art festival attendees, specifically attending to the experience of the young artists and their families. These users would attend at random times throughout the three day event, begin at different locations, and require minimal orientation to the app and art viewing conditions. The result was its construction as a reliable "storybox" embedded-narrative application for AR. The application reflects this through its use of specific geographic access points at the art festival that allowed users to access and read site-specific history on each of these points with their phones. The key design requirement for content creation was allowing children to develop their real-world interpretations of the sites' history and representation through the integration of their drawings into the application. This resulted in a mediated interactive experience for children and parents to both educate themselves on their everyday environment's history, as well as give an option to showcase the child participant's artwork in an augmented environment.

Figure 8. Simple program flow for users of the HereWeArt app.

The *HereWeArt* app was developed with the Unity engine and an Online Maps plugin that renders the world map behind the scenes. This was mainly used to place the AR content relative to the user's position, in order to avoid making the user interface of the application seem jarring for some people. A custom gyroscope script to handle orientation was also developed as the Google Cardboard software developer's kit (SDK) script would often dim user's screens, likely due to the application's expectation of the user being placed in a VR headset that blocks out light. An earlier iteration of the application had previously loaded all the beacons from Google's *Firebase*, a mobile development

platform. For *HereWeArt* this was deemed too slow of a process and used too much data. Currently, in *HereWeArt*, the only online functionality is GPS. The application does not take into account real-world occlusion. Normally digital objects in AR would be obscured by physical objects and depth and perspective would be confounded. To circumvent this issue the beacons for reading this information in the augmented plane are minimized and hidden entirely when far away. This results in the user being able to see what is currently in front of them without posing as much risk to the digital objects being confounded in the real world or the screen's interpretation. iOS deployment was omitted for *HereWeArt* due to side-loading work requirements. Android users can download an Android application package (APK) which will help to ignore some of these warnings/issues; however, iOS needs a user device attached to a developer laptop in order to achieve functionality.

A 90-minute sample during the festival indicated roughly 40+ people per hour were interacting with the application either as a family unit, group, or individual.
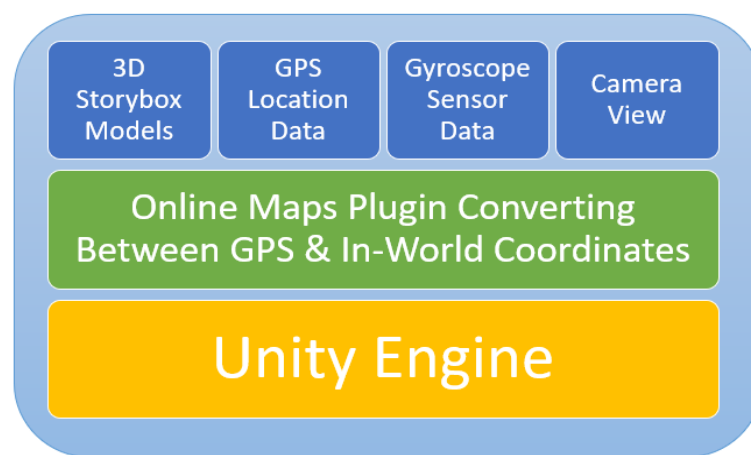

Figure 9. Data stack for HereWeArt app.

DISCUSSION

Through creative development and then later participation processes, *HereWeArt* provides children with exposure to a diverse range of creative modalities. It provokes further possibility thinking which leads to increased sensitivity towards and acceptance of cultural differences.[23] This expansion of milieu is necessary for improving an individual's understanding of broader society. In a culturally diverse society, such as Canada, there is an extra emphasis on the need for this exposure.

HereWeArt showcases young people's imagination in augmented reality. It is a sharing of space through augmented reality placemaking in which children learn that their self-expression is able to shape the world around them. As a placemaking effort it allows them to value their creativity as a form of civic engagement. The future implications of this are involved in discussions with both raising agency in young people as well as re-imagining the way that they can use mobile technologies for civic culture.

HereWeArt is thus also concerned with broader discussions of mobile technology use. The *HereWeArt* app is used only through real-world prompts, thus situating mobile phone use as a tool for real world enhancement, not digital compulsion. There are no vibrating interruptions, or the distracting beeps and pings of notifications. As such, the app does not participate in behaviours associated with problematic phone use. In our age of ubiquitous smartphones finding counter-narratives to resist youth participation in problematic phone use is a social responsibility. Problematic phone use is usually referenced to in context of social media as the addictive and habitual attachments between

mobile phones and their owners,[24] and while initial studies are not conclusive,[25] some researchers have linked smartphone use to mental health issues.[26] This responsibility is amplified in the consideration of children and youth's mobile phone use. Belk suggests that we identify with an object through how we control it.[27] When we consider how *HereWeArt* acts as a sort of social networking tool, it is in opposition to major social media platforms. *HereWeArt* prompts smartphone use in the context of art-based placemaking. Through the *HereWeArt* app smartphones are used as a local cultural networking tool.

There are identifiable challenges within creative placemaking projects: forging community partnerships, countering community skepticism, ensuring maintenance and sustainability, and avoiding displacement and gentrification.[28] *HereWeArt* provides an opportunity to explore these challenges from a variety of perspectives. First, *HereWeArt* involves the root of the community, children. Through contributing to neighborhood placemaking at this level we hope to develop long lasting and meaningful relationships between young people and their communities. Second, the AR component of *HereWeArt* places it into a discussion of digital sustainability, and subsequently sustainable and eco-friendly art. The app plays with multi-modal forms of expression, placing the physically digitized and digitally created artwork of children into an augmented digital reality. There is very little, if any, environmental impact in this placemaking process. Third, as an AR piece *HereWeArt* is inherently unobtrusive to its geo-located environment. The app operates as an invitation for community members to participate. It does not find itself physically imposed into an environment, it is an enhanced layer. This invitational aspect resists negative impacts of physical placemaking efforts which may not be desired by all members of a community. Fourth, exploring further benefits as an AR piece, *HereWeArt* does not change the tangibles of the environment in which it is found. Thus, it does not fall into the typical traps that instigate criticism for placemaking projects, such as gentrification, which usually stem from changes in the material aspects of a neighborhood. *HereWeArt* makes a place more livable, without leading it to become unaffordable.

CONCLUSION

Despite some expected difficulties in developing for the relatively new field of AR geo-located artworks, the application was able to be deployed for the Supercrawl 2018 art festival event with pending approval for iOS store and Google Play options to download. With the inclusion of willing children and youth in the front-end artistic development of content for the nearly unexplored avenue of AR geo-located artworks, *HereWeArt* is able to pose new options for experiential learning in mediated environments. It is also able to explore the conservatory practices of making and preserving art works for potential communities' historical and new media artworks' pedagogical purposes. Future expansion on works like this could include the use of more concise beacons in different, underutilized parts of urban locales for app-holders to explore in a less controlled environment, similar to data drops. Additionally, user participation could be expanded into a database to deploy related works to site-specific AR art. User participation could range from something similar to a collective of works that are able to be deployed, at the curatorial discretion of developers or mediators, at different beacons. This could involve people creating digital artwork submissions to a dropbox-type system and choosing where to deploy thematically appropriate art pieces into the digital sphere in order to be later seen in the AR camera view by others.

ACKNOWLEDGEMENTS

NOTES

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