Art, In Your Pocket: New Currents In Mobile Augmented Reality

Rewa Wright

Abstract

The 21st century presents us with a new paradigm for current art practices. In the context of a post-gallery milieu, interactive topologies have emerged, deploying Augmented Reality (hereafter, AR) on handheld devices to create site-specific artwork. My purpose in this paper is to explore key mobile AR Artworks, relating these to site-specific installation in a post-gallery context. Notions of embodiment, interactivity, and mobility with reference to research in computer science, new media theory, and conceptual art inform this exploration.

Keywords: augmented reality, embodiment, interactive artworks, mobility, conceptual art, portable media devices

Art, In Your Pocket: New Currents In Mobile Augmented Reality

In his seminal "Survey of augmented reality" (1997), Ronald Azuma defined AR as any technological system that combines real and virtual, is interactive in real time, and registers in three dimensions. At the time, the immense mobile computing power of the smartphone was close to a decade away. Similarly, the potential for configuration in the assemblage with the AR medium, was yet to be realized. Today, Azuma's succinct definition still holds, yet we do not need to don a head-mounted display to experience mobile AR. We have the exact tool we need in our pockets already.

An emergent yet intense aspect of convergence between humans and technics is the new intimacy we have with Portable Media Devices (PMDs).[1] The results of this conflation are particularly intense in the emergent medium of AR, now an integrated feature of many proprietary apps made for PMDs. AR is deployed using the computer vision capacities of a built-in camera, often in conjunction with Global Positioning Systems (GPS). In the context of site-specific installation art, AR on PMDs has instantiated a number of exciting artistic practices, and it is the design patterns coming out of this new genre that form the focus of this paper.

AR via the mobile phone posits great potential for guerilla interventions, and practitioners in the United States, Europe, and Australia have explored these contexts. Pioneering this field is the *Manifest.AR* collective, recognised as the key practitioners of this form of AR activist art (Geroimenko, 2014). Tamiko Thiel (2011) has noted that AR in a gallery space displaces the role of curator, as well as contradicting paradigms of commodity exchange: virtual work cannot be easily bought or sold. Works such as *Art Critic Face Matrix* (MoMA, 2011), *Shades of Absence*(Venice Biennial, 2011), and *All Hail Damien Hurst!* (Tate Modern, 2012), use virtuality to posit a new interventionist methodology, one that marks out a bold disruptive space. Reflecting on this emergent activist paradigm, Thiel jibes "AR is street art for artists with bad knees and fear of heights, who lacked the physical prowess and daring to climb buildings and skirmish with the law" (Thiel, 2011).

Her quip, while whimsical, also speaks to what Gregory Ulmer and John Craig Freeman (2014) have identified as the migration of politicised public space into the sphere of the mobile and virtual:

> *Whereas the public square was once the quintessential place to air grievances, display solidarity, express difference, celebrate similarity … it is no longer the only anchor for interactions in the public realm. Public discourse has been relocated to a novel space: a virtual space that encourages exploration of mobile location-based art in public (p. 61).*

---

[1] Here, I have drawn a collective reference category for several devices under the banner PMDs: smartphones & tablet computers, from the main competing platforms, iOS, Android and Blackberry. Other mobile devices (like the Nintendo DS) are excluded, as are "portable" AR systems in general (i.e. head mounted displays or glasses). In drawing these distinctions, I follow Alan Craig (2013).

For the PMD user navigating the intense perceptual universe of the 21st Century, the *glance* replaces the *gaze*. Our attention operates in a relational existence with a wealth of other connected durational moments "the glance is the force of becoming in the field of vision" (Casey, 2007, p. 162). Jonathan Crary (2010) has commented on the way that Joel Sternfeld's project *iDubai* turned the "flaneur" into the "phoneur," an urban wanderer, moving through a location and capturing it with a PMD. AR Art takes this trajectory one step further, where geo-spatial coordinates map public locations, and these coordinates are embedded as Points Of Interest (POI) in a proprietary software browser such as Layar, Junaio, Metaio, and Aurasma. Accessible to anyone with the right proprietary software at that particular geo-spatial location, these virtual artworks represent an important new aesthetic and critical force.

Members of the Manifest.AR group have notably deployed AR as a radical political agent. For example John Craig Freeman and Mark Skwarek's chilling Border Memorial: *Frontera de los Muertos (*Arizona Desert, 2012), deploys 3D skeletons at geographical locations where the corpses of migrants have been discovered, a poignant comment on the localised brutality of globalisation. A vector for political thought and action, this form of AR Art has been used by members of the Manifest.AR group for a number of notable activist works. They include: an AR *flash mob* during Occupy Wall Street (Freeman, 2011); augments placed in the White House and linked to a web channel where one could tweet a message to a speech balloon (*Infiltr.AR*, by Sander Veenhof); and *Sea of Tweets* (Mark Swarek, Tamiko Thiel, & Naoko Tosa, 2012), where virtual cranes were inserted along the Pacific coastline to commemorate the Japanese Tsunami.

Operating outside of the conventions of the gallery space, AR Art made for PMDs signals a profound challenged to the gallery-based systems of the art world. These artworks also divert PMDs and the AR medium from commercial uses in the entertainment, gaming, and advertising industries. While AR Art utilises the same technology as these commercial industries, it has re-situated these advances toward a politicised field informed by a strong cultural and social conscience.

While the political and social conscience of AR Art comes from a sound ethical base, the PMDs themselves pose an unresolvable moral dilemma. As a pressing ecological issue, Sean Cubitt (2011) points to the unsustainable material conditions of our current liquid-crystal display (LCD) screens. They not only cause the mining of rare minerals, but also create a toxic waste dump, as our consumer cultures discard older for better and faster models. (Jussi Parrikka, 2011, and Maxwell & Miller, 2012, make similar observations.) Unfortunately, the Global North's high tech lifestyle carries with it an immense environmental load.

Alan Craig (2013) has identified the principal limitations posed by handheld AR as technological and environmental (p. 214). On the technological side, there is the unpredictability or possible absence of the (cellular) network, the streaming/memory/computing capability of an individual device, and a small screen size. The environmental side holds the potential for adverse external conditions such as lighting, weather, noise, and temperature. Despite these constraints, one thing is sure: people love mobility. Improved technology will lessen the limitations affecting handheld AR and enhance the positive aspects for the user of mobile AR. From a computer

science perspective, the design of mobile AR is increasingly focused on the issue of embodiment. Here, augmented data is combined with bodily movement to enhance user experience and reinforce a meaningful understanding of the associated information.

The enhanced bodily engagement with virtual information expands the users' capability to interact directly with computing technologies to construct an understanding of the setting (Li & Duh, 2013, p. 111). In their article, Li & Duh build on Paul Dourish's (2001) influential conjunction of tangible and social computing via the notion of "embodied interaction." He argues for a user-focused approach to interactive design in response to embodiment as a physiological and cognitive reality. Dourish then articulates the pragmatism of human tool use and suggests ways of applying this to Human Computer Interaction (HCI) design. Issues of embodied interaction are relevant to mobile AR Art, since enhanced bodily engagement plays a crucial role in user engagement, as well as critical and aesthetic appreciation. For example, artworks that require the participant to walk between audio-visual, real time experiences (such as embedded augments situated along mapped trajectory) utilise the sensations activated by embodiment to make critical and aesthetic connections.

Hudson Valley's OMI International Art Centre has installed *Peeling Layers of Space Out of Thin Air*(2011) a permanent AR exhibition by architects, where virtual architectonic sculptures materialise out of a seemingly vacant field (Shardlow, 2014). Traversing the field with a PMD, a virtual space emerges, dotted with augmented perspectival lines of force. Since 2010, the *(Un)seen Sculptures* series of outdoor shows (2010-2014), has presented the AR work of many artists to the Australian public ([Un]seen Sculptures, 2014). Artists embed Points of Interest (POI) as augments along a path that the user must encounter between each node. Participants follow a map, in a group or alone, but always on foot. As a virtual extension of an outdoor sculpture walk, this type of exhibition engages the participant at a social and physical level. Embodiment in this context is physiological and cognitive. While the artwork itself is virtual, it enters into a concrete relational schema to provoke an affective response within the participant.

Nathaniel Stern (2013) has proposed the schema of the "implicit body" to account for the embodied interactions that engage participants in new media artworks. He takes a lead from Brian Massumi's work on thinking-feeling stating that:

> *Interactive art … can create a space of intervention that brings a situated moving-thinking-feeling to a higher power. "… Here we encounter moving-and-thinking-and-feeling as they are: at once autonomous and with one another, as emergent agencies and effects and affects" (p. 66).*

Stern argues that an interactive art "stages" an "implicit body" as a performance: the body of the participant as it moves, thinks and feels with a work of interactive art. This incorporation into the work produces an ongoing constitution that shifts both body and work. The two produce one another in a mutual and reciprocal relationship along a continuous trajectory. The "space of intervention" produced by implicit body artworks, re-situates the "static" body as a "continuous" body. Sensation effects an emergent state to challenge and disrupt habitual practices. Embodiment becomes a strategy that can disrupt, shift, and perhaps even transform the everyday, the familiar: it is micro-political.

In much AR Art, walking (as a strategy of embodiment) is crucial to the participant's experience of an AR Artwork. Indeed, the work presupposes a participant who is willing to move around a series of nodes, finding, tracking, and pausing, before moving on. This participant's exploratory situation differs markedly from that of the conventional art gallery, where a viewer needs only approach an experience. AR Art demands an extra level of effort from the participant. Yet, this effort pays off by adding to a heightened aesthetic, critical engagement, and experience of the work.

AR Art is also aligned to the Land Art and Conceptual Art movements of the 1960s and 1970s, when influential works such as *Spiral Jetty* (Robert Smithson, 1970) attempted to draw the audience out of the gallery and into the natural environment. Conceptualist works such as *A Line Made By Walking* (Richard Long, 1967) circulated images of documented works that would remain physically unseen by the audience. His work foregrounds the way we now circulate digital images on the Internet. As it was for Land and Conceptualist Art, documentation at the site has been important for AR Art. It ensures an enduring virtual record independent of the site, and regardless of the user's physical ability to click on a POI. Art engaging urban participants such as *Une Journée Dans La Rue* (A Day in the Street, April 19, 1966) by Groupe de Recherche d'Art Visuel (GRAV) aimed to disrupt the everyday routine of Parisian foot traffic. They directed passers-by to participate in kinetic and technological situations that participants may not recognise as art. At the same time, the Situationist International posited the notion of "psychogeography" to displace familiar interpretations of the city and its spaces. AR Art draws on these traditions with the critical aim of extending them into the realm of the virtual, for access at any time.

Summary

What is it about the PMD that makes it an appropriate tool for site-specific AR Art? Firstly, the PMD is a media assemblage that insists on the paradigm of multitasking, where our daily routine now requires us to comprehend complex audiovisual schemas in real time. Secondly, PMDs are "contingent" devices. They join and leave various technological and affective states such as playing a game, then sending a text, then receiving a phone call in varying oscillation through the course of a regular day. Thirdly, PMDs are context sensitive and encourage social interaction, attributes that make them ideal as devices for delivering mixed reality scenarios. Engaging with an AR Artwork has become one of the tasks we can do just as easily and quickly as checking an SMS. This is not to say that the experience of art has become any less meaningful; just that art is now an everyday part of our connected, networked existence. If it is "normal" to pull out a PMD and capture an image of a compelling scene, then this convention provides an opportunity for the artist to design experimental artwork that operates alongside this behaviour. Mobile AR Art on PMDs integrates with our already unfolding daily routine. It builds on everyday behaviour and commonplace technology in a way that means the user does not feel isolated or out of place when engaging with an AR Artwork. Our urban, social, networked spaces are brimming with opportunities for aesthetic and critical engagement through AR. The cultural power of AR Art lies in its interventionist and guerilla tendencies: it need not ask "permission" to exist in public space.

References

Azuma, R.T. (1997). A survey of augmented reality. *Presence: Teleoperators and Virtual Environments, 6*(4), 355 – 385. Retrieved from http://ronaldazuma.com/papers/IWARpos.pdf

Casey, E. S. (2007). *The world at a glance*. Bloomington, IN: Indiana University Press.

Craig, A. (2013). *Understanding augmented reality: Concepts and applications*. Burlington, MA: Morgan Kaufmann, Elsevier Inc.

Crary, J. (2010). *Suspensions of perception: Attention, spectacle, and modern culture*. Cambridge, MA: MIT Press.

Cubitt, S. (2011). Current screens. In O. Grau (Ed.), *Imagery in the 21st century* (pp. 21-35). Cambridge, MA: MIT Press.

Freeman, J. C. (2011). Retrieved 12 December, 2013, from http://www.apollo-magazine.com/augmented-reality/

Geroimenko, V. (Ed.). (2014). *Augmented reality art: From an emerging technology to a novel creative medium*. Cham, Switzerland: Springer International Publishing.

Maxwell, R., & Miller, T. (2012). *Greening the media.* New York, NY: Oxford University Press.

Parikka, J. (2011). Introduction: The materiality of media and waste. In J. Parikka (Ed.), *Medianatures: The materiality of information technology and electronic waste*. http://www.livingbooksaboutlife.org/books/Medianatures: Open Humanities Press, JISC.

Shardlow, E. (2014). Retrieved 12 December, 2013, from http://www.apollo-magazine.com/augmented-reality/

Stern, N. (2013). *Interactive art and embodiment: The implicit body as performance*. Canterbury, England: Gylphi Limited.

Thiel, T. (2011, April 19). Cyber-animism and augmented dreams. *Leonardo Electronic Almanac*. Retrieved from http://www.Leoalmanac.org

Ulmer, G. L., & Freeman. J.C. (2014). Beyond the virtual public square: Ubiquitous computing and the new politics of well-being." In V. Geroimenko (Ed.), *Augmented reality art* (pp. 61-79). Cham, Switzerland: Springer International Publishing.

(Un)seen sculptures. (2014). Retrieved 4 May, 2014, from http://www.unseensculptures.com

About the Authors

Rewa Wright is an artist and technologist from New Zealand, fascinated by shifts in dynamic systems and emergent computational assemblages. She works across the territories of installation, generative art, animation, documentary, and live audio-visual performance and is currently most interested in creating post-gallery situations combining augmented reality with site specific installation. Rewa has a professional background crossing industrial with experimental indigenous media in broadcast, post-gallery, and live performance situations. She is currently working toward her PhD in Art, Design & Media at the University of New South Wales in Sydney. Rewa holds a Master of Literature in Art History, and a Master of Arts in Film, Television and Media Studies, as well as a Post Graduate Diploma in Fine Arts.

Contact: rewawright@gmail.com

Academia.edu: https://cofa.academia.edu/RewaWright
YouTube: https://www.youtube.com/user/TheSTanleyKnives/videos

The Journal of Creative Technologies (JCT)
https://ctechjournal.aut.ac.nz

ISSN: 2230-2115

Colab, Auckland University of Technology, New Zealand

The Journal of Creative Technologies (JCT) is an online, open access, peer-reviewed journal for the publication of research and innovation about new technologies, creative practices, and critical theories. The journal aims to explore applied, methodological and theoretical perspectives on emergent technological platforms and strategies through thematically focused issues.

JCT is a research communication platform published by Colab at the Faculty of Design and Creative Technologies, Auckland University of Technology.