



Holographic prism projection: extinction rebellion & energy futures on sci-fi television

Thor Kerr, Raymond Grenfell, Hafizur Rahaman, Maureen Boyle & Richard Eames

To cite this article: Thor Kerr, Raymond Grenfell, Hafizur Rahaman, Maureen Boyle & Richard Eames (2023): Holographic prism projection: extinction rebellion & energy futures on sci-fi television, Media Practice and Education, DOI: [10.1080/25741136.2023.2225960](https://doi.org/10.1080/25741136.2023.2225960)

To link to this article: <https://doi.org/10.1080/25741136.2023.2225960>



© 2023 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group



Published online: 12 Jul 2023.



Submit your article to this journal [↗](#)



Article views: 96




View related articles [↗](#)



View Crossmark data [↗](#)

Holographic prism projection: extinction rebellion & energy futures on sci-fi television

Thor Kerr ^a, Raymond Grenfell^a, Hafizur Rahaman^a, Maureen Boyle^b and Richard Eames^c

^aCurtin University, Bentley, Australia; ^bUniversity of Tasmania, Tasmania, Australia; ^cCurtin University, Bentley, Australia

ABSTRACT

This study in media practice provides insights on video production for holographic prism projection, which has become more accessible as smart flat screens have become more available. The study reflects on the experiences of producing, installing and viewing a documentary video projected via holographic prism, titled 'FarNearFutureNow.' Engaging the participation of Extinction Rebellion (XR) members, this university-funded production included recording and combining interview footage with energy policy texts in the visual style of the hologram scene from Star Wars, the 1977 science-fiction film. With viewer co-experience, environmental politics and legacies of colonialism in mind, we produced a 5-minute video and prism projection system for public exhibition. FarNearFutureNow was produced through collective processes of gathering, assembling, reviewing, storyboarding, scripting and editing interview footage and other recordings as well as testing and fabricating installation materials. These production processes enabled us to understand the affordances of creative darkness in holographic production for disassociating and recombining visual elements. The hologram's disassociated focus on a single object proved useful in drawing audience attention and for assembling non-fiction elements in sequences referencing popular fiction. It is also useful for showing radically different visual scales in sequence, and for simultaneously juxtaposing audio and visual scales.

ARTICLE HISTORY



Received 24 February 2023
Accepted 13 June 2023

KEYWORDS

Documentary;
environmental education;
science fiction; future;
temporality; spatiality

Introduction

In this article, we reflect on the practice of producing video for projection via a holographic prism that was part of a project aimed at enabling critical thinking about representations of future energy transformation. The FarNearFutureNow installation described in this article was conceived in 2021 in the only Australian state where carbon dioxide emission levels were continuing to rise. As we began intensive research,

CONTACT Thor Kerr  Thor.Kerr@curtin.edu.au  Building 209 Room 354, School of Media, Creative Arts and Social Inquiry, Curtin University, Kent Street, Bentley, WA 6102, Australia

© 2023 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group
This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives License (<http://creativecommons.org/licenses/by-nc-nd/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited, and is not altered, transformed, or built upon in any way. The terms on which this article has been published allow the posting of the Accepted Manuscript in a repository by the author(s) or with their consent.

engaging participants from Extinction Rebellion and planning production of the audio-visual installation, the Government of Western Australia (2021) reported the state's emissions were 21% higher than 2005 levels largely 'due to strong growth in mining and exports and increased emissions from stationary energy and fugitives from oil and gas development.' In developing our audio-visual intervention in 'the context of what appear to be widescale practices of environmental destruction, biotic extinction and anthropogenocide' (Briggs 2021, 159), we worked in the 'difficult space of simultaneous critique and action' (Rose et al. 2012, 3) associated with environmental humanities where research approaches are re-imagined with consideration of the scales of time and space around poetics and narrative. Specifically, we seized a university-funded opportunity to examine the technics and politics of visualizing energy futures by producing an audio-visual artwork (Kerr et al. 2022) for installation at the *Energaia* exhibition at John Curtin Gallery in Perth from March to May 2022. Reflecting on the research, production, installation and participant feedback on *FarNearFutureNow*, this article provides lessons for future holographic prism productions as well as fresh insights on futures visualization as a political-technical process of projecting recordings of the past.

FarNearFutureNow is a five-minute video recording projected upwards from a television screen and reflected into holographic form via a transparent acrylic pyramid. Juxtaposing scales and genres, the work addresses Australia's Long-term Emissions Reduction Plan (Australian Government 2021) while demonstrating the dogged persistence of colonial space in science fiction and planetary crisis (Rieder 2008). Leading to its first public viewing, John Curtin Gallery (as listed on its website on 9 August, 2022, <https://jcg.curtin.edu.au/exhibitions/2022-energaia/>) promoted the work's 'holographic projection riffs on *Star Wars* to include the voices of Extinction Rebellion.' In the exhibition catalogue for *Energaia: Imagining Energy Futures*, we introduced our work as follows:

FarNearFutureNow explores energy transformation in Australia as a disruptive trans-scaler encounter where futuristic visualisations appear anachronistically within the colonial space of resource exploitation and science fiction representation. Mimicking the holographic plea by Princess Leia of the Rebel Alliance in *Star Wars* (1977), *FarNearFutureNow* appeals for viewer agency in a struggle against planetary destruction. In this holographic projection, a cosmic zoom into Ngarluma country is cut short by the transmission of future energy plans which are, in turn, disrupted by members of Extinction Rebellion and their appeals for immediate action. (Robertson et al. 2022, 19)

Our study in educational media practice, we contend, can be read in the spirit of Bernard Stiegler challenging Jacques Derrida to illustrate how the time and space of a newly dominant teletechnology (media system, in the broadest sense) could be understood in relation to an older teletechnology. Derrida and Stiegler (2002) were calling for consideration of analog video and television in relation to writing, and 25 years later our project called for consideration of platform digital media in relation to film and television. Both sets of thinkers were driven by questions about rationality and intelligibility in the transcalar relations between varying media systems (2002, 104) that constitute space and time (Briggs 2015; Derrida and Stiegler 2002). We shared Derrida and Stiegler's (2002, 52) interest in processes of 'artificiality.' We wanted to create adequate distance for producers, participants and, potentially, viewers to reflect on how platform capitalism (Van Dijck 2013; Srnicek 2016) produces 'actuality' (Derrida and Stiegler 2002, 41) in environmental discourse (Hajer 1995). *FarNearFutureNow* was created as an artwork to encourage critical

thinking (hooks 2009) at the nexus of environmental representation and science fiction narrative (Rieder 2008) but also as a modest intervention in teletechnology to encourage construction and transformation of the field of perception and experience (Briggs 2015). It articulates Derrida's desire: 'that we have to change television, that we have to change all these spaces and times' (Derrida and Stiegler 2002, 112). In this spirit, our processes of research and production for FarNearFutureNow considered media technics, systems and cultures (Johnston 2008; Grenfell 2020), temporal and spatial scale in representations of environmental crises and solutions (De La Bruheze 1992; Kerr 2015), as well as transcalar relations in environmental humanities (Rose et al. 2012) and screen studies (Horton 2021).

In this article, literature will be reviewed that informed methods of producing FarNearFutureNow. Observations about its installation at John Curtin Gallery and interview feedback from participating Extinction Rebels will be analysed. Findings will be discussed, conclusions made and suggestions offered for future practice in producing videos for projection via holographic prism. The insights for media practice are important in the context of holographic prism projection becoming a relatively inexpensive and accessible form of system interface for education projects.

Literature on co-experience: from I to we

Co-experience, according to Forlizzi and Battarbee (2004), occurs as experiences are created together or shared with others. Co-experience is a richer experience. Individuals' reject, overlook or reciprocate meanings, elaborating or re-inventing them through social interaction. Thus, co-experience raises experiences to shared attention, where they become part of a social meaning-making process (2004). Ingold (1996 in Forte and Bonini 2010) claimed that a multi-user environment enables a deeper emotional and perceptive environment by triggering a non-linear meaning-making process. Learning occurs in a reticular way rather than in a linear pattern, according to Bateson (2000). Meaning emerges in the context of being involved and in action (Forte and Bonini 2010).

Our perception implies action – or better inter-action – between the subject and the environment, or among subjects (Maturana and Francisco 1980). The meaning that we give to a sign or object does not come before semiosis, but emerges within semiosis (Lotman 1976). Values and meanings begin with the relationship from the observer. As such, human reasoning and meaning-making processes are inherently dependent on embodiment (Dourish 2001). McCullough (2004) explained that embodied learning or embodied experience occurs at several levels, from 'preconscious engagement of affordances, to personal construction of mental models, to cultural mediation of spatial literacy' (36). Conversely, Vygotsky argued against artificial separations between the mind and behaviour, and between the mind and society (Daniels 2005; Nardi 1996). Following Vygotsky's emphasis on the centrality of mediating devices such as language and other tools in the development of mind and thought, Gay and Hembrooke (2004) argued that humans develop and learn as people acting on their immediate environment. An individual's relationship with and orientation towards an object is, thus, not only mediated by the tools (to attain the objective) but also by the community participating in the activity and the division of labour in the community (Engeström 1999).

Collaborative and participatory modes of learning promote contextualization and social knowledge sharing (Arnseth et al. 2004). Participation indicates co-presence and

shared experience in an interdependent world that accentuates the social dimension. Imagery and allegory are linked with common experience and metaphors enabling the formation of an outlook or mental image of the nodes, paths and landmarks that enable a space to be remembered. Meaning is associated with narratives and social experience, and develops in a process of co-creation with the meanings of other humans/animals (Briggs 2021).

On activism: environmental movements and platform capitalism

Environmental movements in Australia have, historically, found purpose and efficacy in physical places – street rallies, protest camps and direct-action blockades. McIntyre (2021) argues that protest camps set up by environmentalists as a form of *obstructive direct action* served to disrupt the destruction of native habitats and also to create prefigurative, anarchic models of organization. These movements, similar to recent town square occupations (Lim 2014; Fuchs 2014), found their power within physical places (Brady 2019). The significance of the physicality and place relations of environmental movements has become more prominent as these relationships have been transformed and challenged in an age of platform capitalism (Van Dijck 2013; Srnicek 2016). As social movements have come to adopt social media platforms as tools of organization, communication and protest (Sancho 2014; Tye et al. 2018; Uldam 2018), the ways in which activists seeking radical change organize and communicate, as well as the importance of place and space in these movements, has changed dramatically.

From its inception, the Extinction Rebellion movement has found itself embedded within the reality of platforms and platform capitalism (DeLuca 2021). In Perth, the movement uses Facebook and Instagram to promote events and livestream actions, as well as for communication and internal organization (DeLuca 2021). While not unique to Extinction Rebellion, the use of these platforms may have significant implications for relationships to space and place (Lim 2014), as well as impacting on the possibility for movements to create prefigurative models of organization (Fuchs 2014; Fuchs and Trotter 2017); and also raises concerns of security and anonymity (Juris 2012; Lim 2014). In other words, studies of environmental and other social movements indicate that activist practices have changed through engagement with the contemporary teletechnology of platform capitalism.

On futures: environmental crisis and science fiction

Meanwhile, there has been a scalar turn at the nexus of scholarship examining representations of environmental conservation and energy production. This turn is suggested in De La Bruheze's (1992) investigation of texts generated between 1945 and 1960 by the United States Atomic Energy Commission. This investigation described how the problem of high-level radioactive waste was solved politically, for years, through scientific discourse envisaging that a future solution to radioactive waste would be developed before accumulation of the waste became too much of a problem. The environmental problem was solved through policy discourse envisaging future solutions even when a 'long-term solution ... had not been found' (De La Bruheze 1992, 163). Meanwhile, Hajer (1995) demonstrated how the articulation of an environmental problem around

energy production could shape the solution to that problem. Representation of environmental problems became the key site of environmental politics in determining policy. Indeed, wave-like shifts in the dominant discourse of environmental problems have been identified: from industrial pollution problems in the 1960s to mid-1980s; to sustainable development problems from the mid-1980s to early 2000s; to climate change problems from the late 1990s (While, Jonas, and Gibbs 2010). These particular problems enabled the articulation of certain solutions: pollution controls, ecological modernization and carbon controls respectively. Further, the legitimacy of an environmental solution was determined not just by the particular environmental problem to dominate public discussion, but by representations of the spatial and temporal proximity of the environmental problem (Kerr 2015). Scales of time and space have been shown to be determining factors in environmental discourse around energy production, pollution and conservation.

A scalar turn has emerged, also, from scholarship coalescing under the banner of environmental humanities. Rose et al. (2012) call for consideration of deep time drawing on 'geology, evolutionary biology and climate science to recast human stories within the context of larger synergetic time frames,' as well as consideration of 'how many of our poems, songs and stories are deeply reliant on interactions with larger, non-human landscapes' (3). Schneider-Mayerson and Bellamy (2019) looked to Indigenous stories and speculative fiction in developing a lexicon for alternative subjectivities capable of overcoming environmental crisis. Meanwhile, Uhall (2020) argues a subjectivity capable of addressing ecological crisis can be generated through transcalar ecological encounters that enable old attachments to be shed and conceptual landscapes to be remapped in creative darkness. Film noir illustrates the concept where darkness is the creative framework for production of cinematic contents emerging free from everyday attachments (Uhall 2020, 74). Similarly, Muecke (2017) argues that environmental crisis can be overcome by reorientating subjectivity away from *having* attachments towards a greater sense of *being*.

In screen studies, Horton (2021) has applied scalar difference theory to contemporary media to argue that the 'digital forms that entrap us in our current milieu also deliver the tools to extend that milieu, and thereby subjectivity' (215). By examining recent cinematic representations of rapid shifts in scales from discrete pixel to database to cosmic zoom, Horton found that when trans-scalar access is increased radically beyond representation of the observed world it 'cannot but form a new subject' (213). Yet, the transformative potential of the disassociating trans-scalar encounters in some contemporary media productions, such as the science-fiction film *Lucy*, is likely to be constrained within a subjectivity of platform capitalism that privileges human fantasies of transcendence. As Horton argues, the 'first step towards the illusion of transcendence ... is always to conquer or occlude scalar difference' (22). Overcoming ecological destruction, then, requires representations of difference in temporal and spatial scales and representations suggesting the conquest or occlusion of scalar difference. In this regard, Ghosh (2021) draws attention to the persisting, haunted, scientific rationalities that drove Dutch colonization at fantastic spatial and temporal scales; destroying and displacing peoples, plants and animals from the Americas to the Dutch East Indies. Also, Rieder (2008) demonstrates how colonial space, time and culture has been reproduced in science fiction representation. Therefore, Horton's (2021) call for representations of scalar alterity, from pixel to cosmic zoom, in

science fiction film will only go so far toward the new subject who doesn't seek progress (Tsing 2015) by destroying ecology (Ghosh 2021) or by leading others in lost worlds (Rieder 2008) or worlds lost (Coleman 2019).

The literature reviewed suggests that any intervention in the colonial context of media practice in Western Australia (Kerr and Cox 2016) – towards an ethical horizon (Zylinska 2005) of the contemporary subject who does not endanger ecological systems – should engage not only scalar alterity (Rose et al. 2012; Horton 2021) but also address the haunting persistence of colonialism in science fiction (Rieder 2008) and the spectral-scientific texts of colonial institutions (Ghosh 2021).

Methods: co-experience, production, feedback

This section describes our approaches to designing a co-experience installation, to engaging the participation of members of Extinction Rebellion, to producing a video for the installation, and to gathering feedback from participants. In July 2021, the lead author of this article was invited by the organizers of *Energaia* exhibition to propose production of an installation that would visualize energy transformation. This invitation stimulated discussion about visualizing scalar contests around energy futures, and the formation of our project team (the authors of this article). At our first team meeting we adopted the idea of creating an installation where meandering visitors would encounter holographic prism(s) projecting video to demonstrate scalar alterity in contests about energy futures. A holographic prism/reflective prism display could support a collaborative and participatory mode of experience, and interactions between viewers (Thap et al. 2018). If our prism was substantially larger than the mobile-phone scale of this technology used in classroom education, visitor co-experience and interactions could occur at the minimal social-safe distances required under COVID-19 restrictions at the time.¹ We aimed for the installation to afford mediated communication that encouraged viewer agency, dialogue among visitors as well as their unrestricted movement around the installation. The aim was to raise individual experience to the level of shared attention where visitors become part of a social meaning-making process.

Co-experience: constructing a reflective/holographic prism

Our FarNearFutureNow installation applied 'Pepper Ghost' technology, devised by Giambattista Della Porta in 1584 (Johnston 2008) and, later, used commonly in theatres. The illusion method uses glass or any reflective material to reflect light from a projection to create a holographic effect. Although this method generates a holographic effect, technically it is not a true hologram. A hologram refers to a specific medium that stores image data through a laser, a holographic substrate and an interference pattern. On the other hand, Pepper's Ghost uses a simpler technique to create an illusion of a 3D object floating in a physical space by reflecting an image off a surface (i.e. the projection source).

Applying the Pepper's Ghost method, a reflective/holographic prism enables viewing of a computer-generated object from different perspectives through the multi-side of the prism (Figure 1). The reflective display prism is set upside down on top of a projection surface (such as a mobile phone, tablet or monitor screen) projecting four distorted

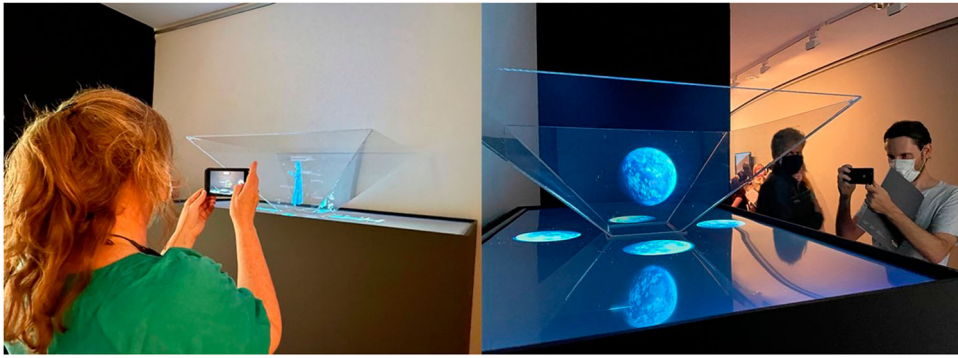


Figure 1. FarNearFutureNow installation at John Curtin Gallery. Photographed by Hafizur Rahaman.

views (front, back, left, right) of any 2D image onto a prism surface, where it is reflected, generating the illusion of a floating 3D object.

The reflective prism offers a solution for displaying specially designed and composed video content in the form of holograms in a fun and immersive way. When video content – 3D animation, motion graphics, interviews, text, and images with audio – is projected upwards from a smart television, the only other hardware required is a memory stick, a monitor stand and a reflective pyramid prism. We conducted several trials between August and December 2021 to determine the size, shape, material and angle of the pyramid, and the development of video content to ensure effective experience for viewers.

To create a Pepper's Ghost effect, a transparent material with a reflective surface is ideal. Two types of materials are commonly used for this purpose: glass and acrylic plexiglass. Acrylic plexiglass was preferred because it is cheaper, lighter and easier to use – acrylic screens were installed in many local retail settings during the COVID-19 pandemic. Various thicknesses and types of materials such as acrylic, polycarbonate and PETG were examined and assessed based on weight, reflection, clarity, cost and stiffness at the required scale. We settled on a 4.5 mm acrylic sheet for the pyramid.

Our initial trials using overhead projector transparency sheets and thin plastic sheets indicated that a 45-degree inclination of the pyramid affords the best viewing. The angle between the inclined plane of the reflective pyramid prism wall/sides and the horizontal projection screen was, therefore, set at 45 degrees. We had to then specify the screen size before determining the size of the holographic pyramid. We wanted to use an everyday television screen for the projection, thus acquiring a low-energy TCL 55-inch 4 K QUHDTV. The television is 123.5 cm wide, 71.5 cm high and 8.5 cm deep; including its bezel the shortest side of the screen was, effectively, 77 cm. This measurement was used for the length of the pyramid base, from which we calculated pyramid height trigonometrically. Once the height was known, each face was calculated and measured to cut the four acrylic sides of the pyramid. [Figure 2](#) indicates how the size of each triangle face was calculated.

In producing a holographic effect, it was important to avoid window violation where the appearance of an object would be cut off due to exceeding the window size – the reflective surface size/area of the prism. A viewer's suspension of disbelief may be lost

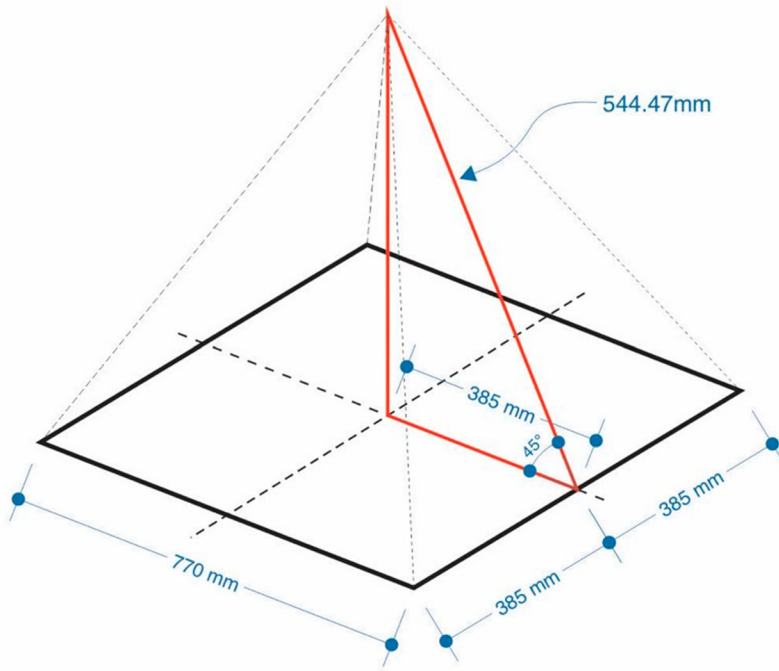


Figure 2. FarNearFuture Now prism dimensions.

if the image is sliced or part of it is outside of the viewable area. Therefore, the entire projected object should be within the viewable area to produce the floating effect (Figure 1 and Figure 3).

Initial trials with different 3D objects indicated that self-contained objects – a tree, car, watch, planet, etc. – with a black background work well with this reflective projection system. The scale of an object and placing the object in the centre of the projection area are important factors to consider. In this project, we used green screen techniques (Foster 2010) to remove the background from interview footage (Figure 3).



Figure 3. Green screen techniques were applied in producing the video. Photographed by Hafizur Rahaman.

In late 2021, we were informed that FarNearFutureNow would be installed in the John Curtin Gallery for public viewing. In discussions and a studio viewing session with gallery staff, it was determined that the television screen should be positioned at the gallery's maximum eye height of 1600 mm in a wooden plinth (Figure 1) for the duration of the *Energaia* exhibition. The acrylic pyramid weighs over 5 kg, so to avoid screen damage we included a square acrylic plate to distribute the pyramid's point load evenly over a broader area of the television screen. Additionally, weights were placed in the bottom of the plinth to ensure its stability.

Co-experience: video concept & extinction rebellion participation

FarNearFutureNow was created at the intersection of art and documentary video applying an approach that deliberately foregrounds 'the formal choices and aesthetic experience of the work' (Frankham 2018, 179) to enable critical thinking (hooks 2009) by producers, participants and audiences to emerge from collisions, frictions and mixing of temporal and spatial knowledges in the work.

From our earliest interactions as a creative team and with screen arts technical staff at Curtin University as well as members of Extinction Rebellion, there was an enthusiasm to work around the Princess Leia holograph scene in *Star Wars* (Lucas 1977). Everybody we spoke to about the project knew of this cinematic scene, thus, making it a useful science fiction reference for a work aimed at stimulating critical thinking about representations of future energy transformation. After our work was exhibited, we learned that the scene was used in a holographic phone hack on YouTube (As of December 14, 2022, <https://www.youtube.com/watch?v=XWICDKvXb74>). In *Star Wars*, the 'you're my only hope' scene is set on a futuristic colonial farm – colonial space (Rieder 2008) – a 'long time ago in a galaxy far, far away' (Lucas 1977). In the scene, Princess Leia delivers a secret message and call to action via holographic projection for the audience, positioned alongside Obi-Wan Kenobi and Luke Skywalker, to become reluctant heroes on a journey to prevent planetary destruction (As of December 15, 2022, on the *Star Wars* website <https://www.starwars.com/news/6-ways-holograms-play-an-important-role-in-star-wars>).

The three participants interviewed for the FarNearFutureNow video were all active members of the Perth Extinction Rebellion (XR) group and were known to one of the authors. Grenfell had begun working with XR in 2019 for a PhD project on activist communities' social media practices. Grenfell was trusted by Perth XR because of his decades of involvement in Perth's activist community, and through his roles as coordinator, presenter and producer of Indymedia since 2004, an activist-oriented radio programme on local-community radio station RTRFM (As of September 28, 2022, on its website <https://rtrfm.com.au/shows/indymedia/>). However, Grenfell found it more difficult than expected to engage XR members in audio-recorded interviews for the PhD case study. This reluctance to participate may speak to a perceived split between idealism and materialism in academia, which Graeber (2016) describes as an assumption that the work of academics takes place in conceptual bubbles, somehow separate from material, social and economic realities. Yet, in late 2021, the proposition of being interviewed on green screen for production of a Princess Leia hologram was appealing, at least, to some XR members. We used a studio at Curtin University – with an HD camera, green curtains and carpet – for the afternoon of 5 November 2021. The three

XR participants arrived separately on schedule. Each participant was introduced to the studio space and co-authors. Each participant signed consent to participate, with the right to withdraw and have their recording deleted within three days of production. Participants spent several minutes becoming familiar with the studio and being in front of camera before their interview. We encouraged participants to feel at ease in the space and confident in their own knowledge. Meanwhile, equipment was checked. Each interview began with open-ended questions about visualization of future energy production and energy transition policy, then participants were encouraged to discuss anything or do anything they liked. One participant chose to stand and perform, others sat for interview.

Production: storyboarding and story structure

Once the interviews had been transcribed, interesting insights and themes were highlighted for potential incorporation into the video component. From late November to early December 2021 we engaged in a collective reflective process of creating, reviewing and amending a set of storyboards to include insights and interesting visuals from the interviews alongside visual, audio and text about Australia's Long-term Emissions Reduction Plan (Australian Government 2021) with additional video and audio clips from stock libraries as well as our own archives. The *Star Wars* hologram was our initial reference for the work's visual style and for a story that our narrative would reference. The retro-futurist visual style for retail signage adopted in the video was inspired by *Blade Runner* (Scott 1982) and its corresponding retro-futurist audio style was inspired by the sound of games outside a supermarket in the opening of the *Been Caught Stealing* music video composed by Avery and Farrell in 1989 (available on YouTube as of November 30, 2021).

As the storyboards and narrative structure developed, an audio recording was added of Indigenous activist Josie Alec (As of December 15, 2021, Perth Indymedia at <https://soundcloud.com/perth-indymedia/save-our-songlines-josie-alec-on-opposition-to-the-scarborough-gas-hub>) being interviewed at a rally to defend Ngarluma country in the Pilbara from a gas project. Ngarluma country and surrounding Indigenous countries are, arguably, at the epicentre of resource extraction and carbon-dioxide emissions growth in Western Australia. Opening with Alec's voice enabled us to add a slow cosmic zoom towards earth, towards Ngarluma country before her voice and the zoom was cut off by a '2050 BAKE SALE' sign and retro computer game noise. The next shot we added in was a zoom towards the cover of *Australia's Long-term Emissions Reduction Plan* with an audio recording of then Prime Minister Scott Morrison spruiking a list of the plan's carbon-dioxide-reducing technologies. The next shot is a continuous bank of solar panels in an opposite, sped-up version of *Star Wars*' opening crawl. Then the sequence reverts to the cover of *Australia's Long-term Emissions Reduction Plan* with the voice of Extinction Rebellion's Les Harrison saying, 'It's empty it doesn't have any substance at all.' Emily-Oscar Siggs then appears in the visual style of the Princess Leia hologram, mimicking Leia's movement of sending the holographic message before it's too late. Interview extracts from the three Extinction Rebellion members are then played beginning with Tahlia Stolarski, seated, calmly describing major flaws in *Australia's Long-term Emissions Reduction Plan*. The Extinction Rebels all appear speaking calmly within an empty background in a sequence mixed with images of resource extraction and

transmission interruption noises to enrich the sense of a hologram being projected precariously. Towards the end of the video, Les is shown saying, 'We are just ordinary people, from all walks of life who are incredibly and sadly very concerned about the future of our children.' The final sequence of shots shows Emily, in the visual style of Princess Leia, spinning in apparent pleasure while their voiceover states:

Anything short of being disruptive to key parts of the system, at this point in history, is pretty much a death sentence. It's not going to shift fast enough unless there is a real material threat to that kind of entrenched power.

The transmission breaks ups and ends.

The use of storyboards before editing enabled more post-production time on the project's unique presentation as a hologram. The final output required a square aspect ratio and solid black around all edges of the frame so as not to break the holographic illusion. Except for the opening shot, the emission reduction plan cover and a protest photograph from Maureen Boyle, all other non-interview footage was sourced from stock footage libraries. The opening shot of Earth from space was custom-made digitally to track in specifically to the North-West region of Australia, the area of concern in this work. In shot selection, careful consideration was taken because all footage required either chroma or luma keying, or rotoscoping to remove elements from their surroundings to provide the necessary black edges. The *Star Wars* hologram effect was a key motif and was achieved using a third-party Adobe After Effects plug-in built to emulate popular Hollywood digital screen VFX. Further informed by the *Star Wars* scene, we made extensive use of glitch plug-ins to continue the concept of the entire work as a distant and breaking down transmission, and as a useful device to conceal edits.

Installation observations and participant feedback

John Curtin Gallery recorded 2,304 people visiting the *Energaia* exhibition between 28 March and 8 May 2022 (Robertson 2022) amid the greatest surge of COVID-19 infection in Western Australia: New infections leapt from 1,000 a week in late February to almost 100,000 week by May when borders opened (Government of Western Australia 2023). While overall experience of the exhibition and our work seemed positive, we did observe some negative feedback from visitors that FarNearFutureNow's volume was too low, making it difficult to understand. This difficulty was due to constraints of exhibiting in John Curtin Gallery's Atrium and Access Galleries, and the curators' deliberate positioning of 'collisions between artworks that may at once portray a didactic take, but then in the next moment leave a question unanswered' (Robertson 2022, 1). FarNearFutureNow was installed with other works in a wide passage where its volume had to be limited and where it was not isolated from the sounds of these other works or from conversations among gallery visitors. Feedback collected on the *Energaia* exhibition online and via digital display near the exit was mostly positive about the exhibition, but included a comment about the exhibition space being 'cramped and difficult to engage with the pieces which should have been place further away from each other so that each could be truly appreciated.' Only 11 responses were recorded in the exhibition survey and no feedback was specifically about FarNearFutureNow. Lack of engagement with the exhibition

exit survey may have been caused by visitors not noticing the survey screen, or by their desire to avoid touching a common screen during the infection wave.

Comments on the work by John Curtin Gallery's staff that we observed between March and May 2022 were all positive and complimentary: from gallery receptionists to installers to communications staff. Also, in the gallery's documentary film (Aliedani 2022), Curtin University Screen Arts Lecturer, Sally Goldrick, mentioned the work in describing her passage through the exhibition: 'Then there was the holograph which was really impressive.' FarNearFutureNow was mentioned at a keynote for the launch of Chrulew's (2022) edited volume, *Phase Change: Imagining Energy Futures*, at the gallery on 5 May by University of Western Australia's Literature Professor Tony Hughes D'Aeth, who talked about becoming more spatially aware while viewing the work.

In October 2022, six months after the exhibition had ended, we sent a questionnaire by email to the three Extinction Rebellion participants. The voluntary questionnaire asked the participants to reflect on FarNearFutureNow and their involvement in the production process. Two pages of typed feedback was received from each of two participants. For whatever reason, the other participant did not return the questionnaire.

In responding to the first question on why participants agreed to be interviewed on video for FarNearFutureNow, their reasoning included: to be able to explain their environmental concerns; to explain their views on 'Australia's lack of action on climate degradation' and the environmental and social costs of its enduring loyalty to fossil fuel industries; to offer their perspectives to a broader public beyond their sphere of environmental activists, friends and family; to practice speaking publicly about climate change; and to explore new or altered mediums for communicating a message.

They enjoyed the video interview and production process. The green-screen studio was a 'really cool' place for the interview. However, they would have liked more time to become familiar with the crew and being on camera before the interview to be able to speak more clearly and explain things more effectively. Meanwhile, openness and enabling creativity in the semi-structured interview was important: 'I liked that the team let us do fun things we wanted to do, and put our own flair in it,' wrote one participant.

They wrote the installation was 'well done' and 'turned out amazingly.' Yet, it was hard to find within the exhibition, and light interference prevented better placement that would have enabled more people to view FarNearFutureNow simultaneously. Also, the installation's audio should have been louder. Yet, amid the cluttered soundscape of the gallery hall, 'I liked how you had to come up close to it and peer inside to see our tiny doppelgangers speaking.' Also, the work provided 'a sense of connectedness and story throughout the interview.'

As a learning experience, they responded that talking about the issue in an unfamiliar place and on camera helped them become better at communicating their message and 'ensuring a clearer and more interesting translation of the message.' Other learning included how to make a viable hologram. One respondent learned 'what it felt like to be Princess Leia giving that message of desperation to someone who might never see it.' A respondent was surprised to see themselves in FarNearFutureNow saying: 'Don't feel powerless. That's what all these companies and things that are destroying the earth want us to feel.' This statement defied the respondent's belief in corporations logically wanting consumers to feel nothing but positive emotion for their products: 'so this

suggests I've internalised fear or anger towards these companies.' The respondent reflected further: 'I felt bad that I had said something so emotion-driven and inaccurate, and hoped nobody in the audience thought I was fictionalising this very real struggle.' Yet, the Princess Leia imitation provided a fictional context for our story so 'perhaps it worked in a way that people could understand and relate to.' Arguably, in mentioning the imposition of disempowerment, the holographic rebel Emily encourages viewers to think about suppression of their agency; particularly in light of the statement's context:

You can't walk past and go about your life and think it has nothing to do with you, or it won't impact you, or you can't do anything. Because, as a whole, we can do something. We all have to do a little bit, our own part. Don't feel powerless. That's what all these companies and things that are destroying the earth want us to feel. (Kerr et al. 2022)

Encouraging agency in broader audiences was important to respondents. One wrote, 'the fact this wasn't a clear environmental thing was awesome that you did an installation about climate change.' Participants appreciated how the public art object was sensed as being 'interactive, tactile and engaging,' and 'an act of generosity and community' because it was not behind a paywall. The public art installation was also a positive change from the 'lonely affair' of online protest, where curated feeds can become 'an echo-chamber' because they 'are curated just for us and our interests and beliefs.' However, the art exhibition environment was also seen as lacking the power of protest 'to engage new or re-engage tired activists.' This required energy, solidarity and sound: 'it's very hard to ignore a hundred people standing outside your building singing protest songs.' The participants suggested that FarNearFutureNow be installed in public locations to catch the attention of people not already engaged in environmental activism because its story telling method was effective. One respondent suggested that FarNearFutureNow be extended into a longer film by including interviews with more people, even if a longer format only worked on a flat screen. One participant suggested that the current version be provided to Extinction Rebellion for projection on surfaces in public places around Western Australia.

Discussion: using the disassociated focus of the hologram

This study in media practice has found that the mobile phone hologram can be scaled up effectively to at least the size of a 55-inch television screen using 4.5-millimetre transparent acrylic for the reflection pyramid. At this larger scale when playing an appropriate looped video, the hologram can be transferred successfully from the context of classroom and home experimentation settings to a reputable state gallery. The hologram installation can be an effective media for screening a short documentary that places non-fiction recordings about planetary destruction within sequences referencing scenes and characters from popular science-fiction cinema. However, audience reception of the hologram will depend, in large part, on its installation in a quiet, dark setting from where, for example, a 55-inch television version could be viewed and heard comfortably from a range of 1.5 to 3 metres on all four sides of the installation. The study, also, found that environmental activist participation in interviews for academic research is encouraged when associated with holographic screen production that references popular science-fiction cinema. Although this study involved only three environmental activists, the

study suggests that this finding is applicable for adults regardless of their age and gender. The study found that participants were happy to be interviewed in a green-screen studio provided they could express themselves openly and experiment playfully within the green-screen space. Recording schedules should enable a participant to familiarize themselves with the studio space and crew for at least 15 min before being interviewed on camera.

The study found that holographic screen production encourages critical thinking about environmental communications by production crew and participants. It is less clear whether the hologram installation in this study encouraged critical thinking among its audiences. The authors' observations of audience interactions and the evidence collected in this study suggest that *FarNearFutureNow* was appreciated broadly by gallery visitors, gallery workers, students and academics for how it introduced voices of Extinction Rebellion through 'holographic projection riffs on *Star Wars*'; and that the work encouraged thinking about audience space regarding where one stood in relation to representations of environmental destruction, protest and energy transformation policy. From our observations, we can say that the hologram's disassociated focus on a single character or object is useful in drawing audience attention and for assembling non-fiction elements in a sequence that references popular fiction. The disassociated focus is also useful for showing radically different image scales in sequence, and for playing radically juxtaposed scales of image and sound simultaneously: for example, an Indigenous activist's voice from a rally against gas exploration as the camera zooms from space towards Ngarluma Country in the widely recognized landmass of Western Australia. The disassociated focus provides an opportunity for the production crew to think critically about narrative structure in relation to scales and sequences of visual and audio elements in their work. While the holographic form enables us to focus on the temporal and spatial scales (Horton 2021) of audience reception: Shifting from flat screen to hologram enabled us to think about moving an audience that is already in motion around the screen.

Conclusion

This article on researching, creating and installing *FarNearFutureNow* has provided useful lessons for creating future audio-visual works as well as insights for furthering understandings about artifactuality and teletechnology (Derrida and Stiegler 2002). It has been demonstrated that the creative darkness (Uhall 2020) in holographic screen production enables elements from discourses about science and exploration to be disassociated and recombined effectively with references to science fiction in sequences that mimic science fiction cinema. The effectiveness of this combination suggests that not only has science fiction emerged in cultures exalting science and colonial exploration (Rieder 2008), but also that contemporary discourses of science and exploration rely on common knowledge from science fiction while not disclosing this source. Placing a Prime Minister's voice and corresponding policy document from the Australian Government's Department of Industry, Science, Energy and Resources (2021) in a science-fiction frame enabled the policy to be seen as radical irrationality. Characterizing the policy's critics as science fiction heroes enabled voices of Extinction Rebellion to be heard as conservative rationality. The effectiveness of this framing and characterization was supported by its projected reflection from a prism – at Princess Leia hologram

scale – mounted on a 55-inch screen. The project indicates that space for movement and co-experience around the prism encouraged a greater spatial sense of being, toward a subjectivity capable of overcoming environmental crisis (Muecke 2017). For more adequate testing of FarNearFutureNow's effectiveness as an intervention in contemporary teletechnology, this kind of work – and accompanying audience survey – should be installed in public places including darker common places 'far, far away' (Lucas 1977) from the art gallery.

Note

1. The Government of Western Australia closed international and inter-state borders in April 2020, and introduced mask wearing, lockdowns and social-distancing rules. When borders reopened in March 2022 there was a wave of COVID-19 infections: from 1000 a week in February to 50,000 weekly in March then almost 100,000 weekly in May (Government of Western Australia 2023).

Acknowledgements

This research was done on Whadjuk Noongar Country with ethics approval HRE2020-0012 from Curtin University as well as support and funding from the university's School of Media, Creative Arts and Social Inquiry.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

This work was supported by Curtin University.

Notes on contributors

Thor Kerr studies temporal and spatial scales in environmental discourse, particularly trans-scalar encounters around infrastructure projects in communities on the Indian Ocean's eastern rim. A Senior Lecturer in Curtin University's School of Media, Creative Arts and Social Inquiry, Thor's books include *To the Beach* (2015) and *Setting up the Nyoongar Tent Embassy* (2013). Thor's most recent creative work is the Seven-part String (2022) short story in *Meniscus* literary journal.

Raymond Grenfell is a PhD candidate in the School of Media, Creative Arts and Social Inquiry at Curtin University. His doctoral research examines the impact platform capitalism is having on the creation and continuation of prefigurative, counter-hegemonic institutions within autonomist communities. He is a producer and presenter of the Indymedia radio programme on community radio station RTRFM.

Hafizur Rahaman is a professionally trained architect specializing in advanced visualization and digital/virtual heritage. He has been actively involved in research and consultancy on heritage conservation, AR/VR/MxR, 3D modelling, photogrammetry, interaction design and user evaluation for the last 14 years. He has received awards from SIGGRAPH, CAADRIA, *Journal of Archaeological Review* and Humanities Research Awards and Curtin University.

Maureen Boyle is a Post-Doctoral Research Fellow in Human Geography at the University of Tasmania. Maureen is an experienced policy professional, with over a decade of experience in renewable

energy, and a research interest in social justice and energy anthropology. Maureen completed the Doctor of Sustainable Development at Curtin University in 2021, and her research contributed to understanding the influence and discourses of transnational actors working on energy and development projects in Cambodia.

Richard Eames is a filmmaker and digital media artist working in the realms of the moving image and photomontage, Eames interrogates themes of power struggle and liberty with a darkly satirical dissection of current trend lines. He is completing post-production on his debut feature film, and teaches Vision Design at WAAPA.

ORCID

Thor Kerr  <http://orcid.org/0000-0002-7101-1204>

References

- Aliedani, Tina, dir. 2022. *Behind the Curtin*. Perth: John Curtin Gallery.
- Arnseth, Hans Christian, Sten Ludvigsen, Anders Mørch, and Barbara Wasson. 2004. "Managing Intersubjectivity in Distributed Collaboration." *PsychNology Journal* 2 (2): 189–204.
- Australian Government, Department of Industry, Science, Energy and Resources. 2021. "Australia's Long-Term Emissions Reduction Plan." Commonwealth of Australia.
- Bateson, Gregory. 2000. *Steps to an Ecology of Mind*. Chicago, IL: University of Chicago Press.
- Brady, Danielle. 2019. "Space, Place, and Agency in the Roe 8 Highway Protest, Western Australia." *Contention* 7 (1): 29–48. <https://doi.org/10.3167/cont.2019.070104>.
- Briggs, Robert. 2015. "Teletechnology." In *Derrida: Key Concepts*, edited by Claire Colebrook, 58–67. London: Routledge.
- Briggs, Robert. 2021. *The Animal-to-Come: Zoopolitics in Deconstruction*. Edinburgh: Edinburgh University Press.
- Chrulew, Matthew, ed. 2022. *Phase Change: Imagining Energy Futures*. Yokine: Twelfth Planet Press.
- Coleman, Claire. 2019. *The Old Lie*. Sydney: Hachette.
- Daniels, Harry. 2005. *An Introduction to Vygotsky*. New York: Routledge.
- De La Bruheze, Adrie. 1992. "Closing the Ranks: Definition and Stabilization of Radioactive Wastes in the U.S. Atomic Energy Commission, 1945–1960." In *Shaping Technology/Building Society: Studies in Sociotechnical Change*, edited by Wiebe E. Bijker, and John Law, 140–174. Cambridge, MA: MIT Press.
- DeLuca, Kevin Michael. 2021. "Extinction Rebellion, Image Events, Social Media and the Eclipse of the Earth." *Social Anthropology* 29 (1): 216–218. <https://doi.org/10.1111/1469-8676.13002>.
- Derrida, Jacques, and Bernard Stiegler. 2002. *Echographies of Television*. Cambridge: Polity Press.
- Dourish, Paul. 2001. *Where the Action is: The Foundations of Embodied Interaction*. Cambridge, MA: MIT Press.
- Engeström, Yrjö. 1999. "Activity Theory and Individual and Social Transformation." In *Perspectives on Activity Theory*, edited by Yrjö Engeström, Reijo Miettinen, and Raija-Leena Punamäki, 19–38. Cambridge: Cambridge University Press.
- Forlizzi, Jodi, and Katja Battarbee. 2004. "Understanding Experience in Interactive Systems." *Proceedings of the 5th Conference on Designing Interactive Systems: Processes, Practices, Methods, and Techniques* August: 261–268. <https://doi.org/10.1145/1013115.1013152>.
- Forte, Maurizio, and Elena Bonini. 2010. "Embodiment and Enaction: A Theoretical Overview for Cybercommunities." In *Heritage in the Digital Era*, edited by Marinos Ioannides, Alonzo Addison, Andreas Georgopoulos, Loukas Kalisperis, Andre Brown, and Denis Pitzalis, 45–56. Essex: Multi-Science Publishing.
- Foster, Jeff. 2010. *The Green Screen Handbook: Real-World Production Techniques*. Hoboken: John Wiley and Sons.

- Frankham, Bettina. 2018. "Fragments, Form and Photogénie: Using Practice to Research the Intersectional Work of Poetic Documentary." In *Screen Production Research: Creative Practice as a Mode of Enquiry*, edited by Craig Batty and Susan Kerrigan, 177–194. Cham: Springer International Publishing.
- Fuchs, Christian. 2014. *OccupyMedia! The Occupy Movement and Social Media in Crisis Capitalism*. Winchester: Zero Books.
- Fuchs, Christian, and Daniel Trottier. 2017. "Internet Surveillance After Snowden." *Journal of Information, Communication and Ethics in Society* 15 (4): 412–444. <https://doi.org/10.1108/JICES-01-2016-0004>.
- Gay, Geri, and Helen Hembrooke. 2004. *Activity-centered Design: An Ecological Approach to Designing Smart Tools and Usable Systems*. Cambridge, MA: MIT Press.
- Ghosh, Amitav. 2021. *The Nutmeg's Curse: Parables for a Planet in Crisis*. London: John Murray.
- Government of Western Australia. 2021. *Shaping Western Australia's Low-Carbon Future: Developing Sectoral Emissions Reduction Strategies to Transition the Economy to Net Zero*. Joondalup: Department of Health.
- Government of Western Australia. 2023. *COVID-19 Weekly Surveillance Report*. Perth: Department of Health.
- Graeber, David. 2016. "Reflections on Reflections." *HAU: Journal of Ethnographic Theory* 6 (2): 5–9. <https://doi.org/10.14318/hau6.2.003>.
- Grenfell, Raymond. 2020. "Addressing Platform Capitalism: The Legacy of Indymedia and Online Participatory Democracy." *Journal of Alternative & Community Media* 5 (2): 211–227. https://doi.org/10.1386/joacm_00084_1.
- Hajer, Maarten A. 1995. *The Politics of Environmental Discourse: Ecological Modernization and the Policy Process*. Oxford: Oxford University Press.
- Hooks, bell. 2009. *Teaching Critical Thinking: Practical Wisdom*. New York: Routledge.
- Horton, Zachary. 2021. *The Cosmic Zoom: Scale, Knowledge and Mediation*. Chicago, IL: University of Chicago Press.
- Johnston, Sean F. 2008. "A Cultural History of the Hologram." *Leonardo* 41 (3): 223–229. <https://doi.org/10.1162/leon.2008.41.3.223>.
- Juris, Jeffrey S. 2012. "Reflections on #Occupy Everywhere: Social Media, Public Space, and Emerging Logics of Aggregation." *American Ethnologist* 39 (2): 259–279. <https://doi.org/10.1111/j.1548-1425.2012.01362.x>.
- Kerr, Thor. 2015. "Negotiating Green Space Between Ecological Threats and Beloved Objects." *Continuum* 29 (3): 402–418. <https://doi.org/10.1080/10304312.2015.1025368>.
- Kerr, Thor, and Shaphan. Cox. 2016. "Media, Machines and Might: Reproducing Western Australia's Violent State of Aboriginal Protection." *Somatechnics* 6 (1): 89–105. <https://doi.org/10.3366/soma.2016.0176>.
- Kerr, Thor, Raymond Grenfell, Hafizur Rahaman, Maureen Boyle, and Richard. Eames. 2022. *FarNearFutureNow [Audio-Visual Installation]*. Perth: John Curtin Gallery.
- Lim, Merlyna. 2014. "Seeing Spatially: People, Networks and Movements in Digital and Urban Spaces." *International Development Planning Review* 36 (1): 51–72. <https://doi.org/10.3828/idpr.2014.4>.
- Lotman, Yuri. 1976. *Analysis of the Poetic Text*. Ann Arbor: Ardis.
- Lucas, George, dir. 1977. *Star Wars*. United States: Twentieth Century Fox.
- Maturana, Humberto R., and Varela J. Francisco. 1980. *Autopoiesis and Cognition: The Realization of the Living*. Dordrecht: D. Reidel.
- McCullough, Malcolm. 2004. *Digital Ground: Architecture, Pervasive Computing, and Environmental Knowing*. Cambridge, MA: MIT Press.
- McIntyre, Iain. 2021. *Environmental Blockades: Obstructive Direct Action and the History of the Environmental Movement*. London: Routledge.
- Muecke, Stephen. 2017. "Attachment." *Environmental Humanities* 9 (1): 167–170. <https://doi.org/10.1215/22011919-3829181>.
- Nardi, Bonnie A. ed. 1996. *Context and Consciousness: Activity Theory and Human-Computer Interaction*. Cambridge, MA: MIT Press.

- Rieder, John. 2008. *Colonialism and the Emergence of Science Fiction*. Middletown: Wesleyan University Press.
- Robertson, Rachel. 2022. *Energaia 28 March to 8 May 2022: Exhibition Attendance and Reach*. Perth: Curtin University.
- Robertson, Rachel, Stuart Bender, Mick Broderick, Susanna Castleden, Kit Messham-Muir, Matthew Chrulew, Kath Dooley, et al. 2022. *Energaia: Imagining Energy Futures*. Perth: John Curtin Gallery.
- Rose, Deborah Bird, Thom van Dooren, Matthew Chrulew, Stuart Cooke, Matthew Kearnes, and Emily O’Gorman. 2012. “Thinking Through the Environment, Unsettling the Humanities.” *Environmental Humanities* 1 (1): 1–5. <https://doi.org/10.1215/22011919-3609940>.
- Sancho, Guiomar Rovira. 2014. “Networks, Insurgencies, and Prefigurative Politics.” *Convergence: The International Journal of Research Into New Media Technologies* 20 (4): 387–401. <https://doi.org/10.1177/1354856514541743>.
- Schneider-Mayerson, Matthew, and Brent Ryan Bellamy. 2019. *An Ecotopian Lexicon*. Minneapolis: University of Minnesota Press.
- Scott, Ridley, dir. 1982. *Blade Runner*. United States: Warner Bros.
- Srnicek, Nick. 2016. *Platform Capitalism*. Oxford: Polity Press.
- Thap, Tharoeun, Heewon Chung, Changwon Jeong, Jonghyun Ryu, Yunyoung Nam, Yoon Kwon-Ha, and Jinseok Lee. 2018. “Real-time Heart Activity Monitoring with Optical Illusion Using a Smartphone.” *Multimedia Tools and Applications* 77 (5): 6209–6224. <https://doi.org/10.1007/s11042-017-4530-3>.
- Tsing, Anna Lowenhaupt. 2015. *The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins*. Princeton: Princeton University Press.
- Tye, Michelle, Carmen Leong, Felix Ter Chian Tan, Barney Tan, and Ying Hooi. 2018. “Social Media for Empowerment in Social Movements: The Case of Malaysia’s Grassroots Activism.” *Communications of the Association for Information Systems* 42 (1): 408–430. <https://doi.org/10.17705/1CAIS.04215>.
- Uhall, Michael Benjamin. 2020. “On the Political Use of Creative Darkness: Freedom, Subjectivity, and Normativity.” PhD Diss., University of Illinois at Urbana-Champaign.
- Uldam, Julie. 2018. “Social Media Visibility: Challenges to Activism.” *Media, Culture & Society* 40 (1): 41–58. <https://doi.org/10.1177/0163443717704997>.
- Van Dijck, J. 2013. *Culture of Connectivity: A Critical History of Social Media*. Oxford: Oxford University Press.
- While, Aidan, Andrew E.G. Jonas, and David Gibbs. 2010. “From Sustainable Development to Carbon Control: Eco-State Restructuring and the Politics of Urban and Regional Development.” *Transactions of the Institute of British Geographers* 35 (1): 76–93. <https://doi.org/10.1111/j.1475-5661.2009.00362.x>.
- Zylinska, Joanna. 2005. *The Ethics of Cultural Studies*. London: Continuum.