



ensorship and control of the internet, and of hackers' ability to resist these forms of control. On a process level, the project raised issues of artistic vision that arise when authors from distinct domains (tech, IT, business, and the arts) collaborate on a single artistic project.

*\$ echo* was developed through Herrema's participation in the Hack The Space art hack event at Tate Modern on 13-14 June 2014. Hack The Space was run as a conventional hackathon, involving the impromptu formation of teams after a series of one-minute concept pitches at the outset. However, in this case, the organisers (<https://3-beards.com/>) invited not only hackers but also a variety of creative practitioners. The brief from The Space was to use data to create art.

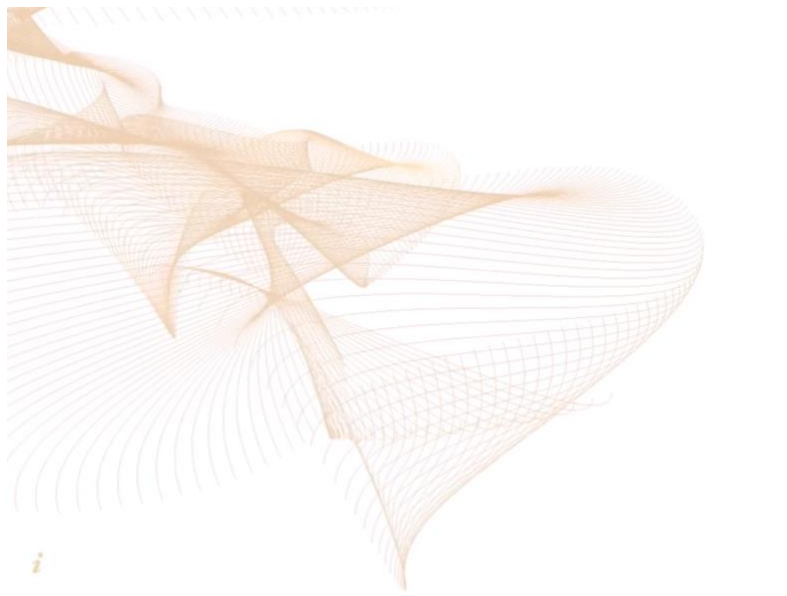
Herrema worked with Armitage, Clark and Sirves, focusing on the question of how a web-based artwork might form a critique of government censorship of the internet. The focus emerged from Clark's work as a web developer and concomitant concerns with cyber-security, combined with Armitage's attraction to the Ai Weiwei dataset. As is typical in the hackathon format, teams were formed quickly on an ad hoc basis, with Armitage recruiting Herrema based on his awareness of Herrema's audio programming expertise. Herrema developed the sound design for the final work using Pure Data (Pd).

The working process explored how the hackathon format can function as a productive environment for making digital media art, considering the ways in which collaborative interdisciplinary practice can be developed in intensive ad hoc working groups. While the impending 24-hour deadline fosters rapid and genuine creative production, the sensibilities of those trained in the arts easily collide with technologists whose own sensibilities are formed more by consumption of popular media, and compromises must necessarily be quickly arrived at. It also considered what kinds of issues arise when technologists and artists collaborate to produce a work of digital media art.

The *\$ echo* project took first place in the event, which included 16 other submitting teams. The Space provided £4000 in R&D funds for winning the event, allowing the team to develop the backend and frontend of the *\$ echo* web app/artwork during August-September 2014, to enable subsequent public deployment. This was further supported by follow-up funding of £11,500 from The Space for the work completed.

## **Infinity (2017)**

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*Infinity* (2017) is a generative artwork, presented as an iPad app, which creates an animated audio-visual experience meant for contemplation, relaxation, exploration, or meditation. The app is graphically and sonically interactive on a minimal level in keeping functionally with the aim of encouraging stillness. The research and development of the app considered how the principal aesthetic and contemplative objectives would be affected by the use of a mobile device as a medium or space. It questioned whether the mobile platform creates new modes of human experience rather

than merely transplanting a mode of experience from one medium to another. The production and testing interrogated how users respond to an app that attempts to balance aesthetics with contemplative practice. The qualitative data gathered from the development process suggested that the app facilitates a casual and fleeting moment of contemplative aesthetic relaxation, further developing the line of exploration initiated with Herrema's previous app/artwork, *Dancing Wu Wei* (2013), the music of his solo CD *Music for Being* (2012), and drawing on his work as a registered Deep Listening practitioner.

The research began with sketches for a second generative, meditative work, following similar principles to Herrema's previous installation and iPhone app, *Dancing Wu Wei*. Whereas the technology available at the time of producing *Dancing Wu Wei* necessitated the use of pre-recorded generative audio, advancements in the ability to incorporate Pure Data within mobile platforms made it possible for the audio in *Infinity* to be truly generative. The decision was also made to migrate from the iPhone platform to the iPad, based on its ability to provide a larger 'space' for contemplation. Finally, Herrema decided that, whereas *Dancing Wu Wei* had involved no touch-based interactivity, he wished to explore in *Infinity* how such interactivity might function within a contemplative practice.

The research focused on how an audio-visual app can function as an interactive environment whilst also encouraging contemplation and stillness. Mobile platforms are inherently interactive environments, and thus it seemed a reasonable accommodation to user expectation to incorporate some level of interaction. On the other hand, excessive levels of interaction would necessarily interrupt the aim of stillness. Accordingly, the app in its final form permits some interaction based on tapping and dragging, but at a minimal level.

It also explored how a mobile app might create new modes of human experience by balancing aesthetics with contemplative practice. Meditation is commonly undertaken in silence. Deep Listening®, meanwhile, proposes listening itself as a form of meditation. And the reaching of contemplative states is commonly associated with the experience of listening to music. (This might be described as being 'transported'.) Yet meditation apps frequently involve either 'guided meditation', wherein a voice instructs the meditator how to proceed, or music comprised of slow synth pads, with little attention given to musical structure. Herrema thus entertained the possibility that an app could provide, on the one hand, some musical and graphic interest and structure, while on the other, not call attention to itself, and thus be conducive to meditative or contemplative states. In this way, the app carried forward Herrema's previous work in his solo CD *Music for Being*. The solution found involved a series of generative, but carefully tuned, drones.

Herrema was then chosen as a selected artist for Music Tech Fest and B3 Media's Hack the Artist event in Ljubljana, Slovenia. This made it possible for him to receive feedback from other artists and a broad range of technologists regarding the potential of the app, as well as providing opportunities for him to articulate its objectives.

Following this event, Herrema undertook further development of the prototype for *Infinity*. In November 2015, Herrema began the TalentLab residency with B3 Media, an artist residency program co-managed by the University of Nottingham's Mixed Reality Lab. In addition to developing the concept, he collaborated with MRL researcher Sean McGrath on the user-centred design process of the *Infinity* app.

In order to test and further develop the app, a series of 12 user observations and interviews were carried out at MRL, in London, and electronically. (Summaries and transcriptions of those five conducted in London and electronically can be found in the PDF document 'Infinity - Interviews & User Experiences'.) Herrema was especially interested in the role of interactivity in the app, as well as how it struck the balance between its aesthetic and meditative aims. While a few of the participants took part in an ongoing basis, the majority of them were involved in a brief, 10-15 minute use of the app while Herrema silently observed, followed by an open-ended interview. The results of these observations and interviews can be summarized as follows: first, participants arrived to the app with expectations typically related to the mobile platform, invariably employing a range of touch-based activities to manipulate the audiovisual events on screen: tapping, dragging, pinching, rotating, etc. The expectations of interactivity in the medium thus created the context within which, and against which, the app could achieve its objectives. All wanted some degree of control, but to different degrees.

Second, with respect to the contemplative/meditative objectives of the app, some users found a disjunction between its sonic and visual dimensions. Some, for example, associate meditation with the closing of the eyes, while others might find the visuals appropriate for their use but the sound not. Third, there was at times some illusion of control, so that users imagined they were creating effects that were in fact controlled by the algorithms in the code. And finally, if the app indeed has a niche, it is in what might be called 'casual contemplation'. As one interviewee stated, using it is something like a 'cigarette break'. Or in the words of another, 'I would turn to this app in the train or airport or other spaces where I would like to shut myself off for a bit from the outside world and enter a state of calm and relaxation.'

*Infinity* was released on the App Store as an iPad app on 21 March 2017. The findings were presented at the Journal of Media Practice and MeCCSA Practice Network Annual Symposium, The Media Convergence Research Centre, Bath Spa University on 8 June 2017.

## **Summary of output contents**

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### **Coding the Contemplative Collective**

- 300-Word Statement
- Research Timeline & Research Questions
- Research overview

#### ***\$ echo***

##### Principal output

- Screen Capture of Prototype Artwork
- Screen Capture of Finished Artwork
- Screenshots of Pure Data Patch & Finished Work
- Pure Data Patch

##### Supporting materials

- Research & Development plan

#### ***Infinity***

##### Principal output

- Application (via Apple App Store)
- Screen Capture
- Screenshots & Pure Data Patch Screenshot

##### Supporting materials

- Journal of Media Practice Presentation
- #HacktheArtist Interview
- Interviews & User Experiences