

# Digital Art Live: Exploring the Aesthetics of Interactivity

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## Abstract

While technologies and theories of interactive media have developed exponentially over the past twenty five years, the aesthetics of interactivity, as a philosophy of perception and validation of interactivity as a form of art, has been slower to emerge. While aesthetic inquiry has expanded to investigate the sensuous perception of many forms of electronic art, interactivity as an expressive medium challenges many fundamental assumptions of traditional aesthetics.

This paper addresses the performative aesthetics of interactivity through a consideration of a programme of interactive art works presented through the Digital Art Live (DAL) project in Auckland. The DAL initiative is New Zealand's only specialised, ongoing, interactive art programme. It has engaged both public and private entities, artists, developers, community organisations, staff and students from three universities. The location of the DAL screen in a performing arts complex introduces some new perspectives into the emerging discourse about interaction, aesthetics and creative practices. Nine DAL projects are considered in relation to issues raised in Simon Penny's critical interrogation of the performative aesthetics of interactivity (2011) and literature on contemporary aesthetics. Key issues including the importance of aesthetic inquiry; the notion of performativity as meaningful, embodied practice; object/viewer spatial relationships; synesthetics and the interdisciplinarity of interactive art; and the relationship between representation and interaction are addressed as part of ongoing research into interactive art that is being conducted through the DAL project.

## **Introduction**

While interactive art emerged as a creative form some 25 years ago, evolving rapidly over a period of remarkable technological development, the theoretical articulation of this medium has been limited. In particular, the aesthetics of interaction as philosophical and critical investigation into the sensuous perception and validation of interactivity as a form of art is an area of inquiry that has been neglected. Penny (2011) declares “we appear to have advanced little in our ability to qualitatively discuss the characteristics of aesthetically rich interaction and interactivity and the complexities of designing interaction as artistic practice; in ways which can function as a guide to production as well as theoretical discourse” (p. 72).

This paper considers nine original works presented at Digital Art Live (DAL), New Zealand’s only public programme of interactive art, in relation to issues raised in Simon Penny’s seminal essay “Towards a Performative Aesthetics of Interactivity” (2011). Reference is also made to universal signatures in human aesthetics (Dutton cited in Pinker, 2002), and specific features of digital media discussed in recent texts on contemporary aesthetics. The authors of this paper are involved as curators and researchers associated with the DAL project.

Within New Zealand exhibitions of interactive art are occasionally presented as part of broader contemporary art survey exhibitions, at private or public galleries, less frequently in ‘one-person shows’ or in association with periodic, specialised events such as the Aotearoa Digital Artists (ADA) annual symposia and the SCANZ (Solar Circuit Aotearoa New Zealand) conference. The development of an ongoing interactive art programme outside of a gallery venue has enabled the development of a range of experimental approaches and has provided a unique situation for ongoing inquiry into the aesthetics of interactive art. Key issues raised by Penny and addressed in this paper include the importance of aesthetic inquiry; challenges to traditional notions of object/viewer spatial relationships; the notion of performativity as meaningful, embodied practice; sensory hierarchies; synesthesia and the interdisciplinarity of interactive art and the relationship between representation and interaction. The works discussed in this paper were presented over a sixteen month period between April 2011 and July 2012, as the DAL curated programme was established.

## **Interactivity and Aesthetics**

As interactive technologies become ubiquitous, theories of interaction and new areas of application are developing across an increasingly broad domain, including interactive learning, interactive marketing, experience design and interface design. In this burgeoning field, it is important to define what is meant by interactive art within the scope of the DAL project and this paper, and to consider why aesthetic inquiry is important.

Claims have been made for interactive art as a broad genre of artistic practice, distinguished by the participation of viewers in a form of engagement that goes beyond purely visual and mental activity, which were the perceptual concerns of traditional aesthetics. Non-digital forms such as installation and performance art challenged these aesthetic boundaries and are included in such definitions. The

authors of this paper have taken a more specific focus, akin to the position adopted by Ars Electronica in 1990, when the category *Interactive Art* was introduced in the Prix Ars Electronica: “The term ‘interactive art’ serves as a genre-specific designation for computer-supported works, in which an interaction takes place between digital computer systems and users” (Dinkla, 1997). One limitation of this definition, like a number of definitions of interactivity, lies in the notion of ‘users’ – a term that implies an operational relationship between human and machine. While this may be an appropriate designation for informational media, it is problematic in relation to interactive art where there is no immediate purpose or function and a more interpretive, responsive, participatory mode of engagement is sought.

The genre of digital interactive art is sometimes broken down into screen-based and gesture-based forms. While screen interfaces – based on earlier mechanical technologies such as typewriter keyboards – are being challenged by more intuitive ‘touch’ interfaces, there is an instrumentality associated with such forms of interaction. The engagement is purposeful, made to produce an outcome or result. Dutton (in Pinker, 2002) identifies “non-utilitarian pleasure” as one of six ‘universal’ features of human aesthetics.<sup>1</sup> (The other features include expertise or virtuosity; style; criticism; imitation; and special focus). The functional approach to interaction is disregarded by the authors of this paper in this consideration of the aesthetics of interaction. We consider interactivity as a medium that produces meaning (Muller, Edmonds and Connell, 2006). Penny also recognises this distinction between modalities of interface and interaction:

Modalities which are deployed as a mechanism for exploring ‘content’, and modalities which themselves contribute to the accumulated meaning or experience of the work, in some interactive work, interactive modalities are taken as transparent and given: the dynamics of interaction were conceived as a means to an end which was primarily found in the ‘content’ of the work (as if interaction dynamics were not always part of the ‘performative’ content). In other cases the dynamics of interaction play a key role in the overall construction of meaning (Penny, 2011, p. 82)

Penny describes these two ‘modalities’ of interaction as ‘instrumental’ and ‘enactive’. He suggests that questions about the meaning of the act of interaction and how “such valences can be manipulated for enriched affective practice” are fundamental to the aesthetics of interactive art. In this paper we have used the term ‘participants’ rather than ‘users’ (a word that implies an instrumental engagement) or audience or viewers (which suggest a spectatorial relationship). A participant is involved in a productive engagement as a condition of the work of interactive art, which “requires

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<sup>1</sup> A distinction must be made here between Kant’s fundamental necessary conditions for aesthetic judgment— subjectivity and universality – and Dutton’s universal features of aesthetics. While Kant’s concern with universality is related to the validity of judgments of taste, Dutton’s focus is on commonalities across the broader field of aesthetics that, in the twentieth century has extended beyond its traditional objects of study such as fine art and nature, to include ‘new’ art forms like cinema (Yates, 2006) and Body Art (Heinrich, 2012) and even into non traditional areas such as the aesthetics of the everyday (Kupfer, 1983; Shusterman, 2000).

further action in order to be resolved; in which artefacts and effects are arrayed spatially and temporally in such a way as to encourage the formulation of novel ideas” (Penny, 2011, p.80). These notions of corporeal engagement and productive action are antithetical to the fundamental assumptions of contemplative distance in traditional, Kantian aesthetics. These distinctions emerge as points of critical engagement in this paper through an inquiry into interactive art produced for and presented through the Digital Art Live program.

## **DAL**

Initiated in March 2011, the DAL project is supported by The Edge, Auckland’s leading performing arts centre and CoLab, a Creative Technologies Research Centre based at the Auckland University of Technology. This partnership was initiated to develop a programme for The Edge’s new interactive screen, located in the foyer of the Aotea Centre in central Auckland. While this initially appeared to be a relatively straightforward process of identifying relevant artists and curating an exhibition programme, it has proved to be a more complex proposition, due to the small number and widely varying levels of experience, conceptual understanding and technical ability among New Zealand artists working in the field of interactive art and the still nascent audience for such work.

The project has engaged both public and private entities, artists and technical developers, staff and students from three universities and community organisations. The relationships forming through the DAL project and its unique position as a focus for the education, development, showcasing and critique of interactive art in New Zealand have presented a number of challenges but have also provided a unique opportunity for discourse development and research into the aesthetics of interactivity.

The format and location of the interactive screen were determined by The Edge management prior to the partnership with CoLab. Sited on a wall in the foyer beside the ASB Theatre, the screen itself consists of 12 Samsung thin flat screens organised into a large composite unit. The overall size of the wall is 4100mm x 1737mm. While the multiple screen set up presents certain challenges for artists, it has other advantages including the clarity and definition of image, and the opportunity to produce single or multiple screen works. The bottom edge of the screen sits above eye level, which makes the relationship between audience and screen more akin to cinema – a factor which affects the sense of immersion and participation. It is anticipated that renovation of the foyer in which the screen is located in 2013 will prompt the lowering of the screen height, improving the immersive relationship between participant and screen. A variety of interactive technologies have been employed, however the majority of works have utilised motion sensors and camera-based tracking systems. All the works have been documented as case studies, drawing on interviews with the artist, developer, curator, technicians and audience members. Both video and photographic documentation have been made of each work.

The projects that have informed this paper include:

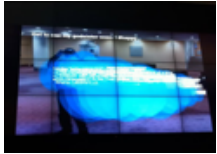




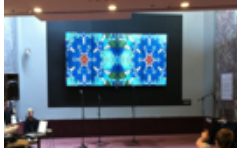
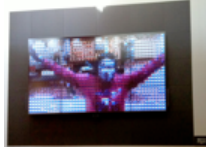


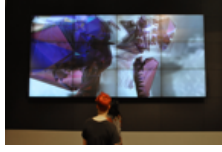
Title	Artist/ Developer	Dates	Image
<a href="#">Chirp</a>	Stuart Foster.	April/May 2011	
<a href="#">Roosting</a>	Kim Newall	May/June 2011	
<a href="#">Test Tone</a>	Clinton Watkins/ Guillame Evrard	July/August 2011	
<a href="#">Be My Mirror</a>	James Charlton	August/September 2011	
<a href="#">Sparkling Spices</a>	Kritteka Gregory /Rebecca Jury	October 2011	
<a href="#">Be Tender</a>	Reuben Patterson/ Izac Hancock	October/November 2011	
<a href="#">Inside Out</a>	Stewart Foster	December 2011	
<a href="#">Typeface</a>	Vaimala Urale/Johann Notje	February 2012	
<a href="#">Growth</a>	Jeffrey Nusz	March/April 2012	
<a href="#">Acute Self</a>	Interrupt Collective	May/June 2012	

Table 1. Details of ten interactive works shown at DAL between April 2011 and June 2012. Please click on title of work to link to more information.

## Interdisciplinarity

Although over half of the DAL exhibitors identified themselves as visual artists, the project has engaged practitioners from a number of different fields including animators, spatial designers, special effects artists, creative technologists, filmmakers, computer programmers and engineers. Some, with both artistic and technical expertise, have worked alone. Others have collaborated, working in pairs or larger interdisciplinary groups (for example, the Interrupt Collective). On several occasions, when technical expertise has been required, DAL has successfully paired artists with developers. In addition, some exhibitions have included associated events involving dancers (Carole Brown with *Test Tone*), performers (Vitamen S with *Be Tender*) and musicians (the hip hop group Solid at the opening of *Typeface*), exploring different forms and levels of interactive engagement with these works. Penny recognises the area of interactive art as a radically interdisciplinary realm, a claim that is supported by the breadth of engagement in the DAL programme. However, Penny identifies a fundamental schism between the technological and the human evident in both the practices and discourse of interactivity, and calls for a more holistic approach:

Consistent with its interdisciplinary history, the analysis of interactive art has a strongly dialectical quality. On one hand, a bone-headedly Luddite approach has all but ignored the fact that machine mediated interaction is a novel context, and that without some familiarity with the technology, discussion of the work is superficial. On the other hand, technocentric approaches tend towards instrumentalisation of the user and the trivialisation of precisely the phenomenon which is in need of explication. Ultimately some critical purchase must be made upon the behaviour of the complete (user/machine) system. (Penny, 2011, p. 78)

This tension between the artistic and the technical is an ongoing issue within the DAL project, not just in terms of critical reception but in relation to production. The small number of experienced practitioners here in New Zealand promulgated by the still limited availability of teaching and research programmes concerned with interactivity in art and design schools, has prompted the DAL project to engage with building greater capability among artists and supporting the development of a community and wider discourse about interactivity as a creative medium. Artists experienced in other digital or non-digital art forms engaging with interactive technologies for the first time, tend to employ simpler interactive strategies. Clinton Watkins, whose established creative practice stems from an interest in constructing immersive experiences through the use of sound, colour and scale of installation incorporating video projection, television monitors and custom-made audio and video hardware, commented on the level of complexity involved in developing an interactive environment for the first time and the need to keep the project concept and execution relatively simple (Case study of *Test Tone*, 2012).

The process of developing an understanding of the capabilities and limitations of a technology is integral to any artistic process. In the collaboration – between Kritika Gregory and Rebecca Jury – both the artist and the developer commented on the difficulties of directly translating or realising the artists initial concepts, with Jury

commenting: “Sometimes she had to work around what she wanted with what was actually possible” (DAL Case study of Sparkling Spices, 2012).

A deeper understanding of interactivity as a medium develops with experience. The project and developmental process between Reuben Patterson and Izac Hancock was distinctive in that it was the second time the artist, a painter whose work draws from traditional Maori motives and fabric patterns using non-traditional, physical media, had collaborated with the developer. The pair had previously worked together on an interactive project commissioned for the Learning Centre at the Auckland Art Gallery and supported by CoLab. Reuben was excited by the opportunity to work with Izac again, to expand this work to a bigger screen at DAL, with a different audience. The Art Gallery kindly gave their permission for the work to be developed further for another venue. This particular collaboration has reinforced our belief that providing artists and developers with the opportunity to work together on a series of projects, rather than just one off events, is an effective way to develop a deeper understanding of the potential of this art form and to build greater interactive capability. Patterson has spoken of how the collaboration extended his understanding and approach to his own work, commenting: “Interactivity is a new contemporary way to define how we relate to artworks” (Case study of *Be Tender*, 2012).

## Expertise

Dutton (2002) identifies human appreciation of expertise or virtuosity as another important aspect of aesthetics. Given the diversity of available programming platforms and interactive devices; the complexities of programming and integrating various components into reliable interactive systems; the particularities of the DAL environment and its technology; and the limited opportunities local artists have had to regularly exhibit or experience interactive art in New Zealand – it is not surprising that there are only a handful of ‘experts’ currently working in this field. In this context experts can be defined as artists (or teams) who have developed a body of interactive art and can work confidently across conceptual, technological and perceptual domains to engage and address “the behaviour of the complete (user/machine) system” (Penny, 2011, p. 87).

James Charlton, Stewart Foster, Kim Newall and Jeff Nusz are artists who are experienced in the development of an interactive art, its technical system, human dynamics and temporality. Both Newall and Nusz used traditional drawing skills and media (colour pencils for Newall, charcoal for Nusz) to generate imagery that was organised into animated sequences triggered through audience engagement. In Nusz’s work *Growth* this process was underpinned by a series of randomising algorithms that created a level of response variation that increased participant curiosity and engagement.

Foster’s initial DAL project *Chirp*, was concerned with the ways people connect and contribute through social media and through their bodies to enable them to portray invisible information through digital media. Foster writes: “We are entering a new realm of digital connectivity where our bodies are extended into digital networked space. The ubiquity of mobile internet connecting devices, electronic displays and

social networking spheres all contribute to the rupture from the corporeal body into a constructed digital self" (DAL Case Study for *Inside Out*, 2012).

*Inside Out*, his second solo work for DAL collated and displayed photos sent in by passers-by attending the Random Acts Festival at The Edge. Collectively these images created an interactive photo album of festival experiences. This work extended the interactive platform developed in *Chirp* to include a different social media platform (Flickr) engaging with another form of digital dis/re/embodiment. Foster's concern with materiality and embodiment within digital practices parallels an issue that Penny recognises as being fundamental to understanding the history of interactive art: "In our current era of ubiquitous computation, the universe of live data which was once called 'the virtual' is increasingly anchored into physical and social context via a diversity of digital commodities" (Penny, 2011, p. 74).

Foster, along with Johann Notje (who was also the programmer for *Typeface* by Vaimala Urale) are members of Wellington based Interrupt Collective that also includes Harry Silver, Angus Woodhams and Ben Jack. The collective includes digital-media artists, interaction designers, live video performers and sonic artists working across a range of live performance projects and installations. The collective brings together individuals with different areas of expertise creating an interdisciplinary team. The focus of the collective is to generate experimental work that explores the boundaries between architecture, video, performance, sound and interaction. They have presented works at public festivals as well as more specialised events. Their collective expertise was reflected in the work *Acute Self*, which was commissioned by DAL with the support of Creative New Zealand funding. This work created a reflexive engagement where the participant's movement in front of the screen generated 3D volume and geometry. This geometry could be viewed and rotated, based on parallax correcting face tracking. As the participant moved from side to side, the object would spin in perspective correcting directions so that the participant could investigate the space that was initiated by their movement. This created an intense level of engagement where audience members engaged in a temporal exploration of imagery generated by the space occupied by their bodies. Timothy Scott Barker (2009) has suggested that interaction with digital systems has traditionally been marked by spatial concepts and metaphors, positioning the aesthetics of interaction as a convergence of spaces where data and agents 'meet'. This preoccupation with space, he suggests has limited many aesthetic theories that attempt to represent interaction with digital systems. Barker proposes a notion of time that is 'scalar', and non linear, "produced by and encountered in interactive events". This concept, which is central to his recently published temporal aesthetic theory for digital interaction, is certainly relevant to the 'multitemporal' nature of the work *Acute Self*.

## Performativity

One distinctive feature of the DAL interactive screen is its location in the foyer of a public performing arts venue, rather than a gallery, a public square or a domestic environment. The notion of performance as meaningful, embodied practice that functions both as a metaphor and an analytical tool, activates a series of distinctive social, technological and cultural framings that the DAL project is allowing us to



explore and analyse. Negotiations between embodiment and the technological, materiality and the virtual, performativity and content, are recognised by Penny as being central to digital art practices:

The lesson of performativity is that the doing of the action by the subject in the context of the work is what constitutes the experience of the work. It is less the destination, or chain of destinations, and more the temporal process which constitutes the experience. To call it 'content' would be again to slip into objectivising language. (Penny, 2011, p. 83)

The way we experience works of art is a central concern of aesthetic theory. Määtänen (2005) suggests that all experience can be interpreted in terms of meanings, and that meanings are associated with different kinds of actions. He identifies two types of action: one, based on the Aristotelian notion of praxis "as action the goal of which is the action itself" and poesis as "action the goal of which is the product of that action". He suggests that we can also distinguish between two types of experiences: those that are valuable in themselves and those that are that are primarily means for some further experiences. Traditional Kantian aesthetics was based on a notion of disinterestedness. A work of art does not have a concrete purpose and a true aesthetic judgment in art comes from a sensation of detached pleasure. Kant believed that "we respond to the object's rightness of design, which satisfies our imagination and intellect, even though we are not evaluating the object's purpose" (Freeland, 2001). Aesthetic experience, in Kantian terms, is a contemplative, intellectual process, and a disinterested appeal to the transcendent. This traditional notion of aesthetic experience is at odds with the form and experience of interactive art as a purposeful embodied activity.

The pragmatist philosopher John Dewey recognised that while aesthetic experience is disinterested, in the sense that it is relatively independent of goal-oriented activities, it cannot be separated from practical activities (1980). Aesthetics for Dewey was a form of praxis. "Aesthetics in this sense is intertwined with life; it is a kind of everyday aesthetics rather than a doctrine about transcendent matters" (Määtänen, 2005). Dewey's challenge to traditional distinctions between the fine arts and other domains of life has been central to the development of the aesthetics of the everyday, a theory that in turn, informed developments in contemporary art in the second half of the twentieth century, including performance art and interactive art.

James Charlton's work *Be my Mirror* referenced pre-digital interactive art and employed an original form of interface, activated by breathing. This work raised important questions about performativity in terms of the role of the artist and that of the audience/participant. In 1966 when Andy Warhol presented his installation "Silver Clouds", visitors were invited to playfully interact with large helium filled balloons. In a contemporary take on Warhol's work, Charlton's exhibition asked people to inflate virtual balloons by blowing into specially designed exhalant devices in front of the interactive screen. Balloons appeared and inflated in the endless void of the interactive screen, floating gently around until they collided with each other and burst. If Warhol's balloons were about the artist sense of himself, then Charlton's balloons spoke to the audience's sense of themselves in the work (Case Study for *Be my Mirror*, 2012).

Penny recognises that historically much interactive art arose in the context of the plastic and visual arts, and that this context helped create a theoretical void: “Whatever the theoretical tools available to address matters of form, colour, expression, and embodied sensorial engagement, those traditions had little to say about ongoing dynamic temporal engagement because traditional art objects do not behave. Within the traditions of aesthetics of the plastic arts, these are fundamentally novel issues” (Penny, 2011, p. 76). Charlton’s work referenced and engaged with these issues.

Inverting what is generally an internalised or intimate experience (that of breathing) into a public and physically demanding form of interface (you had to exhale forcefully into the tube to inflate the balloons), Charlton’s work was provocative. The ubiquity of computer games has provided greater familiarity with gestural forms of interactive engagement, but there are many other physical phenomena that can be tracked with sensor technologies and used to create interactive engagement. *Be My Mirror* drew attention to another form of sensorial engagement: translating the immateriality of breath into a tangible digital form to subvert the divide between the physical and the virtual and recognising the audience/participant as active co-creator rather than passive spectator.

There is another binary noted by Penny that is relevant to the discussion of *Be My Mirror*. This concerns the contradiction between approaches to systems designed for untrained public interaction, which aim to be intuitive, and systems designed for use by specialists, which require knowledge and skill. Penny recognises that appreciation in the fine arts involves specialist understanding but “because art practice is predicated on public exhibition and an imperative of some degree of public accessibility, and because interfaces are often unfamiliar (not a condition experienced in the closed environments of university and corporate research labs), the task of providing ‘intuitive’ access to unfamiliar modalities was (a usually unremarked) part of the design task of artists” (p. 81).

Unlike most other works in the DAL programme which have used camera based motion tracking or Kinect’s gesture recognition system – interfaces that have become more widely accessible and ‘intuitive’ for participants to use – *Be my Mirror* presented a novel interface. This posed a problem of introducing the user to the special modalities of the work. While all the DAL projects are accompanied by a short ‘how-to,’ as part of the project information, this interface required some practice to get mouth angle right, to use adequate lung capacity, to overcome inhibitions about exhaling so forcefully and loudly in a public space. It wasn’t intuitive or discreet. This was a deliberate strategy used by the artist to question the interface conventions that are becoming associated with interactivity as technologies become more available and reliable.

Diaconu (2006) writing about historic arguments against the aesthetics of ‘secondary senses’ of haptics, olfaction and taste, recognises ephemerality, synesthesia, language and physical proximity as critical issues. The oral interface developed by Charlton engaged some of these ‘secondary’ senses. While traditional aesthetic arguments based on ephemerality are clearly contradicted by forms like music, and synesthesia by arts like theatre, the issues of languaging (and subsequently

developing a theoretical and critical discourse) and the related issue of physical and emotional proximity remain problematic.

Because the secondary senses are doubly near by the physical contact and emotional intimacy involved, we are not able to keep a distance from the subjective character of the experience in order to adopt a critical and reflective attitude, which is a basic presupposition of the aesthetic experience. The subject seems either to melt with its pleasant object or attempt to flee from it, if its effect is unpleasant or dangerous. (Diaconu, 2006)

Unlike art forms like dance or body art, where there is an intellectual appreciation of corporeality on the part of the audience, interactive art requires an embodied engagement. *Be my Mirror* involved haptic (touch) and proprioceptive<sup>2</sup> sensing that many participants found difficult because they were novel and intimate.

## Representation and Interaction

Imitation, Dutton suggests, is another defining feature of aesthetics. He recognises that with a few important exceptions like abstract painting, works of art simulate experiences of the world. Andrew Pickering has suggested that representational and performative idioms “are distinct and perhaps incommensurable” (in Penny, 2011), recognising that artefacts within the plastic arts are “representational artefacts par-excellence” (p. 95). Penny challenges this dualism between representation and performativity in interactive art, suggesting that interactive cultural practices, “while deploying representational components”, prescribe a performative ontology: “To the extent that the mechanisms of interaction are naturalised, automatic, ‘intuitive’, ready-to-hand – they do not play a significant part in the epistemological circuit of the work. But to the extent that I have to bend this way, climb that ladder, or stand with my feet in cold water, the doing of the work, the embodied and performative dimensions are and must be designed as (often major) components in the overall meaning of the work” (p. 78).

Kim Newall’s work *Roosting* deployed representational imagery in the form of 12 birds that reacted to the physical positioning of participants. Each bird responded with a different gesture (such as flapping one wing, flapping both wings, rocking from foot to foot etc). Through a sort of anthropomorphic empathy, participants would tend to stand and mimic the action of the bird, prompting in turn another response by the bird. While the trigger for this was locational rather than gestural, the human response was to mirror these movements in an attempt to engage with the bird. Penny also recognises the representational dimension and significance of the relationship between embodied behaviours learned from action in the real world and the way we engage with digital systems:

Interaction makes sense to the extent that it is consistent with or analogous to the learned effects of action in the ‘real world’. Our ability to predict, and find predictable, behaviours of digital systems, is rooted in evolutionary adaptation to embodied

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<sup>2</sup> Proprioception is the sense of the relative position of neighbouring parts of the body and strength of effort being employed in movement (Anderson et al., 1994, p. 1285).

experience in the world. We are first and foremost, embodied beings whose sensorimotor acuity has formed around interactions with humans, other living and non-living entities, materiality and gravity. We understand digital environments on the basis of extrapolations upon such bodily experience-based prediction. (Penny, 2011, p. 78)

Barker (2009) emphasises the temporal dimension in digital re-presentations of events in interactive art. He suggests a notion of time that is scalar: “Here, digital temporality can be seen to yield nonlinear and chaotic temporalities, produced by, and encountered in, interactive events. User-generated occasions are sequential, software occasions are asynchronous, and the temporality of the archive nests within it various levels of the past. The interactive event is the coming together of these occasions – an event in which we encounter multiple scales of the temporal; an event that (is) multi-temporal in nature” (Barker, 2009). Newall has subsequently proposed a further development of *Roosting* where, supported by selection algorithms, each bird will develop and refine its own particular range of movements based on and in response to participant engagement, extending the multi-temporal nature of this work further.

## **Conclusion**

Aesthetic appreciation of this complex medium and its potential requires greater understanding by participants and artists. The rules of composition associated with artistic objects and performances place them in recognisable styles. The articulation of these rules and the judgment, appreciation and interpretation of works of art through them are central concerns of aesthetics. However, the aesthetic discourse about interactive art is both complex and emergent. In particular, the temporal and performative dimensions of the medium demand further consideration. The Digital Art Live programme has engaged both experienced and emerging practitioners, leading to the production of a wide range of interactive artworks. Although artists may use similar platforms and data capturing technologies, there is no overarching conceptual focus or style that unites these diverse works.

Interactivity is a complex phenomenon, and while it draws from a range of other disciplines, it is emerging as a distinctive medium with an ontological framing that involves temporal dimensions and engages through embodied participation in the performance and meaning of the work of art. Penny recognises this profound distinction: “Across a diverse range of disciplines, we are on the cusp of a veritable Kuhnian paradigm shift toward a performative ontology” (2011, p. 100). As interactive technologies have become more accessible and reliable, the need and opportunity for aesthetic inquiry has grown. While helping to build greater levels of technical capability and conceptual awareness of this medium through the DAL programme, we have sought to engage artists and audiences in a deeper and theoretically substantiated conception of interaction. This paper begins to explore and articulate some of these critical issues. Criticality, Dutton also notes, is another signature of the study of aesthetics.

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