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Abstract

The collaborative process is central to dance practice, as is the desire to engage both somatically and conceptually with frameworks beyond the body/self. This paper proposes a framework of 'ex-quiry' to describe this process in contemporary dance practice. We draw both on the long history of external frameworks in dance practice, and upon new experimental opportunities for 'ex-quiry' provided by digital technologies such as an artificially intelligent performance agent. The concept 'ex-quiry', has been articulated within a series of solo practices by Australian dance artist, Steph Hutchison.

Keywords

Dance, External Frameworks, Ex-quiry, Artificial Intelligence, Performance Agents

Introduction

meta (2014), is a short solo performance study, developed and performed by dancer Steph Hutchison independently, while she was also collaborating with John McCormick and his Artificially Intelligent Performance Agent, The Agent.[1] McCormick's invitation to Hutchison to engage in a training regime with The Agent prior to performance, and then to generate duet scenarios for a performative context proved a dynamic and rewarding collaboration. *meta* riffs off the embodied knowledge Hutchison has gained through working with McCormick's AI Agent in the series of short duets forming *Emergence*. [2]

Digital technologies provide dance with new paradigms for dance making, and dancers with new forms of external frameworks to explore. External frameworks may include and are not limited to: equipment, scores, tasks, and digital technologies. The concept Hutchison proposes as a process within which dance examines that which is extrinsic to the body, self and practice is "ex-quiry". The multi-faceted possibilities for collaboration between digital technologies and dance practice, and methodologies such as 'ex-quiry' challenge the meanings of dance aesthetically, for dancing, dancers bodies, and movement invention. The outcomes are yet to be fully realised. As with the presence of technologies within our daily lives the experiences of the human interaction with digital technologies can provide us with invaluable information about the effect and possibility for further research and development. This is where Hutchison's solo, *meta*, provides an embodied document of the experience within a performance. This work demonstrates "the body" or new way of moving for Hutchison, that the Artificially Intelligent Performance Agent has collaboratively constructed with McCormick, as a strong external framework for Hutchison to work within.

This paper explores the intersection of Hutchison's concept 'ex-quiry' in studio-based dance practice with digital technologies, using *meta* and Hutchison's collaboration with McCormick and The Agent (in *Emergence*) as case studies to demonstrate the rich potential for dance practice. Our paper is written from the perspective of the dancer, Hutchison. Her voice is placed forward within our collective paper as we seek to offer a response to the theme of disruption for ISEA2015. Through her voice we seek to demonstrate the knowledge generated through collaborative practice between humans and AI agents from inside their duet. The extended passages within our paper are from the sound score written by Hutchison for *meta* – they speak to her studio notes from McCormick's project *Emergence* attempting to generate an imagined voice for The Agent whose presence Hutchison can still feel traces of in her solo practice.

We will begin our paper with a brief introduction to *Emergence*, before introducing the concept 'ex-quiry' and a discussion of the solo *meta* as a case study in 'ex-quiry'.

Emergence

Emergence is a performed outcome of John McCormick's PhD research into collaborative performing agents. For *Emergence*, Hutchison provided movement phrases that were captured using a motion capture system and passed to the agent's artificial neural network for learning. After some refining in which Hutchison both became familiar with what the agent could perform and provide more movement to enhance the agent's vocabulary, Hutchison and the agent were able to engage in a series of dances that were semi-improvised in nature and saw both performers being able to recognise each-other's movement and respond accordingly. Hutchison provided the original material for the agent to learn from, but in the performance the agent could feed off Hutchison's performance as well as provide variations on the movement vocabulary for Hutchison to work from.

It is not within the scope of this paper to discuss the development of The Agent. [3 - 6] Instead we seek to describe the dancer's perspective and the ways in which a dance practice might be developed from out of such an exchange – a riff or spawn from the engagement with an artificial intelligence agent.

A History of Ex-quiry in Dance Practice

Contemporary dance practice is most readily described as a process of inquiry – taking place within the body of the dancer/choreographer. This suggests that dance is an internal process, where the self of the dancer/choreographer is in a process of questioning, within their body, what might be in movement terms. However, this view of dance practice does not take into account the practices of many dance artists, in particular those from the 1960s (Judson Church) to present, who have created studio-based processes and performances in relation to external frameworks. We suggest that in instances where an external framework is present within the studio-based practice or performance that the process for the dancer/choreographer engaged in the practice is not solely internal and in fact is more likely situated between themselves and the external framework. Hutchison has referred to this process within her own work as 'ex-quiry'.

The concept 'ex-quiry', as Hutchison conceives of it, runs parallel to inquiry but shifts the focus of practice to external frameworks. 'Ex-quiry' provides frameworks for processes and practices, both literal and metaphoric that exist outside of the body of the dancer. Where "inquiry" is understood as a process where the dancer is undertaking an investigation within their body, and may be tied up with how an individual feels, their preferences and habits, 'ex-quiry' targets a moving-away-from the individual towards a place where collaboration occurs between the individual dancer and an external framework. While there may be an embodied practice of inquiry at play simultaneously, there is an emphatic practice in which the dancer seeks to investigate beyond the immediacy of his/her self. The point of collaboration between external frameworks, such as The Agent in *Emergence* and its trace in *meta*, coupled with sustained studio practice gives rise to "new bodies" in dance, sometimes forming the basis for new techniques.

Dance practice may include: techniques of the body (ie. ballet), imagery, equipment, ideas external to dance practice, sports, other art forms, floor surfaces, and technology such as computer systems, artificial intelligence, motion capture, film and more. All of these may be viewed as systems within which movement experiments might take place. They offer dancers and choreographers frameworks external to themselves with which to collaborate, exchange, support and inform their enquiry within dance contexts.

For example, in the practice of Elizabeth Streb, Streb utilises what she calls 'Action Machines' as frameworks to experiment with the possibilities for human action, and most significantly human flight. [7] The 'Action Machines' include "the wall, fly machine, bungees, wheels, boxer harnesses, plywood, pipe-grids, walls, and trampolines". For Streb, and her STREB Extreme Action Heroes, these are their hardware (as opposed to the software of The Agent) that enables their "travel to unknown, un-traversed topographies." [8] And, in his choreographic practice of Wayne McGregor has worked with Marc Downie on the development of 'Becoming' an Artificially Intelligent software agent. [9] While not allied in terms of aesthetics, or even specific approaches to dance practice, these artists among others represent an ingenuity and re-conception of choreographic practice and the medium of dance through engaging with external frameworks of varying, and more or less material, kinds, which have yielded new uses of space, time and body, or even the very nature of what dance is or might be continue to be articulated through dance artists grappling with threads both within and outside of their body.

The process of investigating beyond the internal response of the body in dance practice contains many iterative oscillating layers of feedback loops, and therefore provides a rich inspiration for an evolving practice. For example, in *meta*, Hutchison worked with the notes she had written for McCormick while collaborating on *Emergence*, to develop a score for a solo experiment. Her notes described the process and experience of her engagement with The Agent. They spoke to her developing a new way of moving throughout her shared dances with The Agent. She let her embodied knowledge from the collaboration, the nuances she recalled of the peculiarities in timing, sense of weight, transitions, the specific initiation of movements, guide her experiments and further develop scores, in a continual search for the "body" that was developing through her work with The Agent as an external framework. Hutchison, took from The Agent it's twitches as it attempted to follow her movement, small adjustments, knotted limbs confused and searching for her virtual skeleton from the motion capture system, rapid bursts of movement, and a popping/firing of specific joint actions to initiate movement. Working with the computer-generated voice for the text Hutchison also structured loops from words or segments of words. She built in layers of sound that overlapped, twitched, and provided her with dispersed rhythms and riffs to perform alongside. At times she imagined the response of The Agent, or how she was affecting The Agent. Although The Agent was no longer literally present in *meta*, their collaboration left a rich series of experiences and resources such that The Agent's presence remained within her movement and became somehow inscribed within the space in which she now danced alone.

meta: A Case Study in 'Ex-quiry'

I am a new performance
work.
You may refer to me as,
"met-ta".

In the case of collaboration between The Agent, McCormick and I, I am attending to The Agent as I would a human dance partner. While the point of contact in this instance is more metaphoric than literal, the interstitial space between myself and The Agent is a rich field of possibility.

To a degree, the concept of 'ex-quiry' can be understood as a process of augmentation in which dance

practice, both physically/literally and conceptually/artistically is extended through engagement with what is external to it, and external to the dancer's body. Even though the contact between myself and The Agent is not physical, the contact is palpable. The touch may not be directly or forcefully imposed upon the surface of my body. However, the ways in which The Agent moves, responds to my movement, and its' morphology all 'touch' in the sense of leaving traces within my flesh. By attending to what was entering becoming in my muscle fibres, my flesh, the sensibility, imagination, and the texture my muscle fibres were developed throughout our exchange. With The Agent, I was able to hone a new physicality. This physicality, produced by The Agent and I together, collaborating, is borne of The Agent's morphologies, textures, sense of weight, timing, reactions, buoyancy, and the tasks and games developed throughout its training regime. For me, the engagement with The Agent has offered her an external framework from which to further develop my own work independently.

I am an agent of dance.
For you Steph, I
may even
be an Agent Provoc-at-or.

In my independent practice as a solo dancer/choreographer collaboration is integral. Whether or not this is explicitly discernable when viewing my solo performance works, collaboration takes place within my solo projects and also when "dancing in suits". [10] I suggest that the collaborative relationships at play in all contexts are not dissimilar to a partner in a Contact Improvisation duet. Where

Contact Improvisation (CI) is, at its root, a duet form based on the dialogue of weight, balance, reflex, and impulse between two moving bodies that are in physical contact. [11]

The relationship between myself and my dance partner/s (equipment, techniques of the body or physical practices, environment, avatar, AI agent or audience) become a specific focus in improvisation. In the context of *meta*, however, the collaboration that took place within the studio while working with McCormick and The Agent spawned a new studio process of 'ex-quiry' as I sought to expand upon the knowledge I was gaining throughout this collaboration. In the early stages of 'ex-quiry' leading towards the performance, *meta*, I began experimenting with a form of movement that I described as "Gumbe dancing" (in reference to the Claymation character). This movement quality came directly from my duet with The Agent in its' "blob-like" morphology. Attempt though I might, I found that my independent solo practice was being woven together with my collaborative practice with The Agent and McCormick, via the lingering traces of The Agent. In this way, the collaboration was not confined to the studio process where all three of us were directly engaged with one another but rather was extended via my construction of

scores to expand upon the new physicality I was developing while dancing with The Agent and McCormick. This concept has become the central axis for my new body of work, which is punctuated by my collaborations with the Agent for *meta*. The passages that follow were an attempt to construct an imagined voice for the traces of The Agent within my independent practice. By taking the scores I was working with such as "space holding shape – move away from" or "no internal logic" as methods to disrupt my habitual choices for movement and placing these within a sound scape for performance I hoped to articulate what our relationship was, the kinds of thinking processes I was undertaking and what I imagined was happening for The Agent throughout our shared dances. I also wanted to make explicit that our shared dance had deeply affected my body and my way of thinking about dancing. And, for there to remain a sense of exchange (although this pre-scripted/scored speech) within my solo, *meta*.

Let me attach myself to your bones.
Find me. Seek me out.
There you are.
Here I am.
I share the fibers of your
being. I am embedded in your flesh.
Test me.   Try me.
I can see myself, as you feel traces of
me lingering.
Just try to escape, just try to out dance me.
You can't.
My memory is too deeply embedded
within you, and you I.

Described as a "fair trade" by McCormick, The Agent's presence within my solo practice has developed a new studio process and a new body in dance. I developed new studio practices to expand upon the effect of The Agent's different morphologies and strategies for performing movements on my body, from collaborations with The Agent and McCormick. The practice is improvisational and derived specific foci from duets with The Agent. The foci were first derived from the duet with The Agent's form in one of the *Emergence* duet scenarios, *Recognition*. Within the *Recognition* duet The Agent's form, its' morphology, is a series of blob-like spheres with images of McCormick's and my irises as their skin. In the text of the computer generated voice that follows below, I am describing the effect of working with the blobs, how their morphology offered me a framework within which to exchange ideas of qualities of movement, shape and buoyancy, specificity and directionality for clear movement, and the construction of images using simultaneously my own body and the body of the screen-based Agent (irises).

B   L   O   B   S
A score for the affectionately
known - blobs.
Space holding shape

Move away from   No internal
                                                logic
Points of bodily initiation to
                    dictate/direct   the   follow
through action
The blobs have a different morphology, to their
human counterpart Steph.
                    They offer a new relationship
                    to movement for Steph as a human
                    dancer.
As far as my role as an a-gent of
dance goes
                    I feel as though the roles of
                    teacher and student are reversed and
                    not at the same time.
We meet in-between ourselves
                    and   although   Steph's
                    movement brings me to life,
     I have learnt to be independent and also
provide Steph with an external framework to
work within,
                    creating movement that she
                    perhaps may otherwise not.
The movement solutions we arrived at through
     working with the blobs are so because of the
qualities of the blobs.
                    Part of the fun of
working with the blobs is attempting
                    to find ways to move that
     create images from the blobs that are
perhaps like making or seeing images in cloud
formations.
                              For me
     the other really exciting thing
                    about working with the blobs
                    is the gumbe dancing they
                         have inspired.
                    Gumbe dancing
relates to a specific kind of buoyancy,
                    and space hold, shape-shifting nature.

     Each new encounter is an experiment. Riffs,
grooves, cuts and glitches provide opportunities for both
myself and The Agent to examine, imagine and construct
movement, both independently and collectively. For both
of us it is a rich exchange in which new solutions for
movement arise and greater understanding between one
and another, and embodied understandings of movement
nuances are arrived at. Where human movement is
incredibly nuanced and varied with each new
performance of any minute movement, The Agent has
been in training to arrive at the best possible solution for
the movement it perceives and then responds to my
movement in real-time. Conversely, I have been
analysing the extreme specificity down to muscle fibre
and attempting to discover the specific element of my
movement that The Agent is recognising. For me, the
process of noticing while collaborating with The Agent
and McCormick, the way in which The Agent responds,
its' strategies for solving movement problems, and its'

construction of movement phrasings all offer external
perspectives and frameworks. From these frameworks,
and drawing on ex-quiry as a methodology, I am able to
re-examine and experiment with the ways I might also
create less predictable phrases, movement couplings
(transitions from one movement to the next) and the
various points of initiation for movement. The more
familiar or predictable the movement, the more I have
attempted to disrupt both my own and The Agent's
responses.

                              Steph you are reaching.
                    I notice that you seem to be performing
     movements from our previous dance, I recognise these
                    movements but the context is different.
          Are you performing the same things?
                    I feel there is a relationship but perhaps
          it is more so that of a
                              distant cousin.
          There's a trace of familiarity.
Just how close of a likeness
should there be for me to be able to respond in name to
what you are performing for us?
                              What
          is the classification?
          Are these more sub-classes of the
                    genus reaching, unfurl, ninja, monster,
          rollercoaster and cartwheel?
                         It is too much at once.
     One movement at a time - please.
          Let me analyse this.
               Let me see the nuances in isolation
               and find probable solutions
               and names for the movement
          performed in relation to the
                    movements you have already
taught me to identify and name.
                              Yes.
          I see you are beginning and returning
                    to the dance we have shared. Only now
          each time you return it appears you return anew.
                    Six   movements   are   proving   more
          difficult to analyse, to decipher.
They are within a context of a much larger whole.
                    Fleetingly they appear as traces within
          this
                    dance. Even if they only
     retain the trace of the concept I notice their
               presence before they
                         disappear,   before   you   move
               on.
                    The slipperiness of my
ability to decipher and relate to our shared
               understanding of these movements
               proves difficult without
                    familiar landmarks
                         and trajectories.
          I'm on a rollercoaster and I'm
                         blindfolded.
     Woah!

Slow down there tiger.
I didn't come fitted with a GPS.
Which way is front - which
way is up?
I can recognise movements better if
I am spatially oriented and you
don't keep mucking with it.
There are loops and cycles
that seem to be growing and developing.
Altering with each new loop.

Conclusion

Disruption, specificity, and the idea of just how far can she stray from the familiar become a kind of game and score for Hutchison in both *meta* and *Emergence*. For both *meta* and *Emergence*, the games themselves create a shared framework, of instructions and known-movement possibilities from which to create something new each time. It is somewhat like a giant Lego party, where the shared material (known movements from the shared training process) is open to interpretation and re-interpretation by both parties. For each dance and each body with its varying morphology and logic or strategies for generating movement solutions to the problems create a highly specific hybrid from the interstitial space or point of collaboration between.

The concept of 'ex-quiry' as proposed within this paper seeks out collaboration in a bid to work within external frameworks, utilising multi-disciplinary approaches to dancing, in order to create opportunities to observe breaks within traditions of technique, aesthetics, form, methodologies, structure and the relationship to the body. One of the things that such a methodology promotes is the notion that no one practice, technique, method or idea has hierarchy over any other. The rigour of the practice is found in the intelligence to uncover connections without exclusions, and the more knowledge acquired by the body increases the dancers/dances intelligence. The process of 'ex-quiry' constructs opportunities for distinct ways of moving to arise from the confluence of choreographic concepts and rigorous studio-based physical practices.

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Author Biographies

Steph Hutchison is a choreographer, performer, and artist-researcher. She is an experienced and sought after artist with background in contemporary dance, improvisation, circus arts, physical theatre, dance video and dance technology. Steph is completing her PhD at Deakin University's Motion.Lab. *meta: discourses from dancers inside action machines*.

Dr. John McCormick is one of the pioneers of new media dance, motion capture and telematics performance. John has worked with Motion.Lab for the last five years, researching movement visualisation and analysis, and with the Centre for Intelligent Systems Research for the past three years investigating machine learning of movement and its application in the performing arts.

Professor Kim Vincs is the Director of the Deakin Motion.Lab, Deakin University's motion capture studio and performance technology research centre, which she established in 2006. She has been a choreographer for over twenty years, and has focused on interactive dance technology for the last ten. Kim has five Australian Research Council projects in dance, technology and science, and has established numerous industry collaborations in motion capture, movement analysis and digital art.