Elastic Interactions & Performing Objects

Methods for Embedding Technology Playfulness into Interactive Objects

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This thesis seeks to outline methods that explore interaction when the material object takes the role as playful provocateur.

The process describes how simple, classic toys provide the guiding inspiration for prototypes. Combining the qualities of elastic freedom and surprising movement with simple mechanical input for expressive transformative form. The performative aspects of this movement are explored and described in workshops with contemporary circus artists and industrial designers, with the aim of understanding how expressive and playful behaviour can inspire the design of an interactive playful object.

Finally, a series of provocative and animated latex objects use elastic movement and ambiguous bodily aesthetic to engage an audience in a playful and dialogue between human and machine.

Ultimately, this thesis defines some basic principles and methods for making expressive, and robust moving objects, capable of provoking new interactive experiences. The research concludes with the suggestion that designers should look to the performing arts as a context that allows provocative new interactive experiences and a space for them to be tested on the their merits of expression.
This research project is concerned with exploring new methods for creating playful objects that use movement and material form to provoke new experiences. My intention is to explore methods that use simple inputs to animate objects in a transformative and expressive way.

Methods I have used include performative workshops with circus artists, material explorations with Industrial Designers and a review of theories and research practices in interaction design, play, performance and innovation.

The research could best be described as an Interaction Design research project based on a desire to explore alternative methods for designing materiality into interactive objects and experiences. This is undertaken with the preconceived notion that Interaction Design is preoccupied (sometimes obsessed) with using the technologically new to provide new experiences. The result is experiences that reduce interactive human play to an immaterial and digital performance. I will explore interaction as a movement and material aesthetic, looking to the extreme playful expressions found in the performing arts to inspire new experiences in the physical realm. The aim is to highlight how nuances in material movement and bodily associations can provoke a more sensuous, human and bodily curious experience.

During my process I will step away from the vocabulary of digital interaction design. Instead I will examine prototypes, probes and materials purely on their ability to provoke playfulness. I will also strive to understand the notion of play and playfulness, especially in the context of movement and performance, questing the role an animated object can have in a playful performance. To do this I will invite circus artists and perhaps other performance artists to work with me and my manually animated prototypes.

With an Industrial Design background I have a broad ranging but shallow understanding of Human Computer Interaction and the basic principles of sensors, computers and actuators. The ‘nitty gritty’ of this implementation and programming of these things is for others far more capable and experienced than me. So with that said I will take the seemingly bold but not implausible stance that pretty much anything can be actuated and programmed to mimic simple manual inputs. Thus providing a much quicker method of testing and evaluation of an object’s ability to move and express itself. Any implementation of computer controlled technology will therefore only serve to help contextualise my objects as computer or machine interfaces and prove the legitimacy of it as a machine interface.

**RESEARCH QUESTION:**

How can elastic movement and the performative aspects of playfulness inspire more physically expressive interactive objects and experiences?
Introduction

As a designer I will imagine a future in which interfaces are built on the rich, engaging and multi-sensory experiences of the existing, the material and the real. I will explore how playful movement and material can then be exploited to design expressive interactive objects. I want to explore how this movement can be boiled down to its most abstract form whilst still conveying emotional dexterity.

Playfulness and Computers

Playfulness apparently thrives in the age of computer machinery with systematic functions that give us a strict set of rules and functions to play with and against (Sicart, 2014).

Particularly interesting is how Sicart describes computers with new sensing and communicative abilities as having an ability to play with us, enriching our playful possibilities, stating: “They are systems, but they are open to performing with them or performing themselves in a creative, expressive way, an openness in which they are playful.”

So computers with all their technological affordance can be our playful companions allowing for expression and performance. Sicart’s examples are performing twitterbots that hack trending topics and re-appropriate them or games that use software to playfully appropriate for example the accelerometer or microphone in a smartphone to blow up and shape a balloon. Another example might be Apple’s Siri, using complex AI capabilities and a microphone for frivolous or playful question, answer conversations.

ZeroUI and Immaterial Interaction

Playful appropriation of computers with digital play seems to dictate the design of a computer object that serves as a minimal material gateway to software or technology in the digital realm. The touch screen for example is a functional and robust piece of sterile, non-porous glass perfect for swiping and touching.

I speculate therefore that it is the appetite for digital play with computers is fuelling a dematerialisation of our computer objects.

One interaction narrative that reflects this is ZeroUI (Zero User Interface) (Goodman, 2015). Goodman describes how we are moving into a world where screens and will be replaced by ‘ambient technology’. Speculating towards how interaction designers will be designing entirely in databases and code, imaging a future where “natural gestures trigger interactions, as if the user was communicating to another person.”

This has me asking, is there anything really ‘natural’ about communication through gesturing at something that is physically not there?

It makes me curious about the importance of things, objects and materiality as elements of a playful performance and playful companionship and how they might engage us in ways invisible interfaces, projections, or screens can not.

Movement and Material Objects

In his concept of ‘cognitive friction’ Cooper (2015) describes interaction with a computer as sufficiently complex
Betty was the name of our old Citroen. The one my Mum used to take my sister and I to school in. Every morning we would all urge the car in to life. Some days Betty seemed tired, on others energetic! Her dial hands flicked uneasily on the rev-clock when she was pushed too hard and her rear window vibrated nervously as we passed large lorries. We understood her mood through a sensuous understanding of her movements, smells and sounds.

What was it about this old car that allowed me to project character on it in such a playful way? On reflection my imagination played with the parts of the car that didn't function so smoothly. The rattling of loose parts when it was accelerating allowed for a fragility in character. Maybe it was these imperfections in design, and inefficiencies in the machine that allowed for such vivid character translation.

I can't imagine I would be so playful with character projection if my mother was taking me to school in a Toyota Prius....Even if the integrated AI told us how it felt.
'An Overtaxed Surface' (Jurgen and Smuck, 2013).

Temporal Form and Interaction Design (Vallgårda, 2015)
Three Dimensional Object Expression and Performance

When not so concerned with how the object will move using technology a more nuanced and material approach can be had. One example of this is the puppet horse in War Horse (2007). Here the puppeteers are providing manual actuation. The artists do not then seek to exactly replicate a horse, thus finding very poetic, material expressions that combine to create new experiential elements. For example, the creeks and cracks of the bamboo structure provide a beauty and fragility to the movements and therefore audience perception.

In Miniature Circus (Calder, 1927) the artist takes his inspiration from the classic circus, and using manual techniques animates his mainly wire characters and props. In his later work he explored in a more abstract way how movement can combine with colour, and balance to elicit the same feelings in Standing Mobile.

Liberated from the absence of technology and the desire for their objects to perform these artists are free to explore new expressions of materiality, form and movement in something more three dimensional and expressive.
On Process and Innovation
During the process my aim was to combine material explorations with manual animation techniques, perhaps more associated with the artistic work of Calder and the Handspring Puppet Company in Warhorse to pursue playful expression. However, my overall intention is to create objects that can be automated and programmed with relative ease. This process of working aligns with Abel’s (2015) thoughts on innovation and an innovative process.

Abel states “A fixation on maximum process efficiency and product marketability often leads to “innovations” that are only apparently new. If we are aiming for really sustainable renewal, we have to look more closely at two frequently neglected sources of innovation: creativity and tacit knowledge”. By taking the focus away from the technologically new I am attempting to search for the tacit knowledge within performance and play. This process is about creating objects born from an instinctive understanding between playful performance and playful material interaction. Allowing this knowledge to mature in a context not dictated by the ‘innovation’ narrative of efficiency, technological and immediate product viability.

Abel’s Characteristics of Innovation:
- Have the courage to try something new.
- Give your love of experiment free rein.
- Venture to combine problem-solving methods, practices and strategies in new ways.
- Draw analogies between apparently widely separate fields.
- Activate your imagination and free yourself for mental experiments.
- Establish relationships between levels of orientation.
- Introduce new aspects and different levels of abstraction.
- Think in a very problem-orientated way, and with less discipline orientation.
- Switch between different perspectives and descriptive systems.
- Pay attention to your humour.

Abel’s Characteristics of Innovation:
The Process
Early in my process I focused specifically on The Slinky and Silly-Putty (sometimes called science putty).

I was drawn to them as timelessly playful objects made from one single and robust material with surprising and seemingly addictive properties. These objects were ever present during my research, either on my desk in the studio, or as objects I could use as an example of what I meant by ‘material play’.

Informally, I would give them to others to handle. But often the objects were in their hands before I had time to prompt. By observing what they were doing I was gaining a knowledge of what it was about the materials that kept the informal participants so physically curious and engaged. Two objects that provoked a physically engaging interaction without any need for mastery or understanding of function.

I concluded the following as the most important characteristics of these objects:

**Elastic Potential Energy**
Both objects could be described as having elastic potential energy. The slinky uses form and to a lesser degree its material to spring and move whilst the silly putty uses the material properties to allow for a huge range of flowing, stretch, and bouncing abilities.

Perhaps as humans we associate with elastic on a bodily level in that we ourselves are elastic creatures with pliable skin, stretching and contracting muscles. Perhaps when we play with objects that have elastic properties or joints we approach them with a pre-programmed knowledge of the principles of tension.
**Surprise, Magic**

The elasticity of the materials allows for incredibly diverse transformative properties from a very robust object. These simple objects allow for flow and warp in ways that seem to surprise us. In combination, these properties lead to something quite magical and addictive. They provoke something which I will describe as a bodily curiosity – that is, people’s hands and bodies in constant motion as they test an object’s reaction to new inputs.

**Non-Destructive Playful Affordance (Robustness)**

What is interesting is how one must physically test the objects to understand their physical capabilities. The silly putty is an interesting example as it can be snapped, and stretched but crucially put back together again. It can be thrown at a wall, firing back with high velocity in unpredictable directions but it will not be damaged and probably won’t cause much damage to thing it hits. In this sense it illustrates Sicart’s (2014) description of playfulness being facilitated by an ability to test extreme possibilities without, for example death or destruction. A balloon or an elastic band is another example, something that we all know has a breaking point but there is something in our bodies that wants to test this. As we stretch the elastic band or blow up the balloon the material begins to tell us that it is stressed. We then do two things; either we release the tension or if we are feeling particularly provocative we will continue until the elastic band snaps or the balloon bursts. The result will be a loud noise, turned heads, shock surprise and perhaps a red mark. But crucially none of these outcomes would be devastating. The elastic is cheap and the pain and shock is temporary.
A Playful Material Library

It felt important to surround myself with more material objects, as I searched for these 'playful properties'. It was the bodily reaction with an object like the slinky or silly putty that I was looking for. If I was to gain an understanding how best to manifest these qualities in new animated objects I felt it important to maintain a very material way of working, introducing new materials and objects with similar properties to the ones highlighted for the classic toys.

Based on my conclusions from time spent with the slinky and silly putty I began collecting different elastic materials and objects: Balloons, elastic bands, silicone tubes and pipes, lycra sheet.

Presenting my growing material library with a presentation projected onto stretched Lycra overhead.
As a starting point I wanted to combine structural elements with elastic elements to make something that looked solid but would twist and distort when played with, much like a slinky. It was important for me to make an object that would seem at first static, thus with the potential to surprise those that dared to play, interact and test the movements.

I focused on creating joints that when in the neutral and untouched position would form a cube. However, with force applied I wanted the joints to move, perhaps closely resembling our own joints held together with tendons and muscles. In the case of this prototype the tendons are the elastic bands.

By using elastic as a way of allowing for movement in the shape the cube could play back, giving resistance, stubbornly flicking back after being twisted and distorted. This gave the shape a sense of life. The shape was also incredibly strong and robust, withstanding twisting, bouncing and collapsing. Furthermore if the cube did break, it was non-destructive in that it could easily be reassembled.

PROTOTYPE
Surprising Bouncing Cube

Designing and iterating the joints with 3D-printing and RhinoCAD.
Conclusion

The distorting cube was indeed something that provoked playfulness. An object that when introduced to children at DesignLabS revealed its potential as a toy; modular, and capable of inspiring ideas through easy assembly prototyping: "its a clothes rack, a folding suitcase". However the potential for programmable movement in this object was a drawback for continuation. A structure containing 8 joints was too complex. This was proven when I tried to attach a series of thin wires to the centre of each joint, these were then routed using loops, like on a fishing rod to form 8 individual lines, that when pulled would allow for a force pulling linear to the axis on any of the joints. This was complex and relied on the cube standing on one corner, it lacked robustness and was no longer something that could be picked up and played with.
The aim of this workshop was to gain a greater understanding of how movement and performance affect the aesthetics of playfulness. The form, material and construction of a moving object is not limited to normal human movement and behaviour. It can be extreme, wildly abstracted or simplified. I therefore chose to do the workshop with circus artists in particular, because of their ability to interact with props and each others bodies with movement extremes. My intention was to observe the techniques and patterns of behaviour and movement as the artists interpreted my playful behaviour task, using this knowledge to inspire new prototype iterations.

**Task One: Escalation and Play**
During the first task I asked the artists to sit together at a table and act out a dinner that gets slowly more playful and out of hand. As they performed this task, I would slowly add objects from my elastic material library into the mix; elastic bands, stretchy latex tubes and balloons...

I chose this scenario based on Sicart’s (2015) definition of playfulness as appropriation of a non-playful context. In this case a formal dinner table.

**Task Two: Material Exploration**
The second task was to explore the possibilities of play with the larger elastic objects from my material library that I had brought to the workshop. The intention here was to see the possibilities of movement and interactions with ‘playful’ objects.
Insights

The participants would start off with solo playful exploration of the context, quietly busy, trying to find a provocative thing to do. This was often based on some kind of task. (eg flicking a strawberry into a bowl). Whilst also focused on their own task they were watching each other, seemingly looking to see if someone else was doing a fun thing more provoking or interesting than their own. The most interesting task being carried out would then slowly be adopted by the others. Escalating into a group play. (eg. Others would start hold a glass to catch the flying strawberry). This would continue until the playful task had climaxed in some way. In this example it was a strawberry being caught at the other end of table after being flicked with a spoon. The concentrated solo body movements would then quickly manifest in synchronised yelling, laughing and raising of the hands. They would calm down and go back to solo exploration until a new task caught on. The tasks mainly involved catching objects or composing objects and bodies to find a balance of some description. During my workshop I started to see the physical ingredients of playful action.
Elastic Interactions and Performing Objects  - Harvey Bewley

PROTOTYPE
A Gaggle* of Tripods

* Gaggle: Used to describe a group of geese, or more informally a disorderly group of people.

With the lessons learnt from the circus workshop, the next iteration of this prototype was to reduce the joints to single modules, forming a tripod. When this object was pressed down the energy generated in the stretched elastic would force the object to jump.

Elastic Joints, Surprising Movement, Robustness
The movement was not as surprising as the cube in that the simplification of the structure made it possible to understand that this object would move up and down. They also lacked the surprising twisting forms possible with the cube. This simplification however meant that the moving objects were now very robust. Even when jumping and landing with relatively large forces. Control of the up down movement allowed for tempo change and fine movements. Big jumps could be contrasted with fine vibrations of lowered stops. When animated together the tripods gave the impression of objects talking to each other.
Conclusion

The key improvement with this prototype was the simplification of input with new expressive qualities. An example of the new expressions: when introduced to a group of industrial designers I set up a box with routed threads. A method, as described previously, too complex with the cube. Essentially, I was mocking up a simple linear actuation. Replacing what could well be a programmable actuator (for example a stepper motor) with the pull movements of the participants.

During the workshop the objects were repeatedly referred to as ‘creatures’. Furthermore, when each tripod was controlled independently by different participants the instinctive reaction was to use different tempos to create different characters, creating a dialogue between the tripods. It was possible to understand this movement as emotional expression. For example the designers tried to use the objects to complete tasks, such as picking up silly-putty with the base of the joint. However when the participants could not complete the task they reacted by showing frustration, pulling repeatedly hard and fast on their strings. This simple change in speed and tempo of the pulling actuation translated into objects that went from controlled and concentrated to a frantic and frustrated gaggle of creatures.

Rendered Experimenting with size, forming a larger ‘gaggle’
Using my material library I asked a group of Industrial Designers to play with possibilities and combinations of the elastic to find different combinations of playful interaction. The one that stood out was when we attached two balloons to either end of a tube. Creating one large chamber of air. The elasticity in the balloons meant that when one was squeezed the other would inflate and stay inflated until it was also squeezed, returning the air down the tube and back into the other balloon.

Using this technique it was possible to send signals down the tube, as a squeeze on one end resulted in a mirroring in the other (equalising pressure). The person on the receiving end got instant physical feedback as the balloon pulsed in their hand. Although everything was there to see, it still felt surprising and ‘magical’. It also felt alive, it was like a heartbeat. This strange phenomena inspired me to explore air as an actuation method for a new expressive moving object – The Throber.
The first iteration of this prototype (Above) involved the concealing of the tube and presenting the 'interactive' object on a wooden box. By concealing the connection and making it look like the object was balanced on a box without connection, I was attempting to enhance this magic and the sense of surprise when it started moving.

The reasons for using a Lycra skin was firstly to conceal the balloon, with the assumption that a participant would expect a balloon to inflate and deflate. Secondly it was to provide a texture that allowed caressing and stroking, something a 'sticky' or 'grippy' balloon texture does not afford. Finally it was to give a sense of security. This was on the assumption that a balloon comes with the anxiety of a loud bang and bursting. By introducing lycra, there is a sense of security (the Lycra restricts the balloon from getting to big). This would allow the participant to be a bit more aggressive and expressive in their reactions and responses.

**PROTOTYPE**

**The Throbber**

**Conclusion**

This prototype is a good example of playing with the temporal form to gain a provoking expression and experience, again using manual methods to replicate the possibilities of soft robotic actuation.* The Lycra and latex orb can pulse rapidly or slowly. The change of tempo can be changed and rhythm can be introduced alongside a sudden halt in movement or physical volume. In this case provoking the participant into a playful interaction with poking, squeezing, grabbing and holding.

This method of making a moving object I felt took me beyond the tripods in that they had the potential to be very surprising in their movements. There was also no need for mechanical elements, or numerous parts, meaning the objects have the potential to be inherently more robust. Finally, I felt with a combination of new forms beyond a simple orb shape and new material textures this had a lot of potential to give me the extremes of movement needed to convey the different movements. Or as I have previously

*When looking for controlled inflation movement methods, I discovered soft robotics. A sub group of robotics that uses the precise control of air or water to actuate, soft, normally silicone objects.
described, a potential for expressive dexterity.

**Throbber Iterations:**
*Multiple Chambers, Lycra, Tubes, Lights*

The images on this page show an exploration of materials to give me more control over movement and output, thus allowing for different expressions.

Figure A shows how a latex balloon (airtight chamber), Lycra and a foil sheet can be stitched together ready for animation. Combining the two already creates a slightly anxious expression in that we are not sure exactly how to decode it first hand. Furthermore, the sound of the foil gives the associations to something rather anxious.

Figure B shows multiple Lycra Chambers. An example of exploring the potential of multiple chambers where similar construction techniques with stitched Lycra form independent compartments. The result is an object that can physically move in different directions, and pulse and change in volume with different tempos simultaneously. The addition of a internal lamp both enhanced the colour change as the Lycra stretches to reveal the red of the balloon and added a warmth to the object that made it feel alive. Figure C shows how syringes can be used to mock up more accurate air control in this object.

**Conclusion**

Combining different chambers with different materials and the newly discovered world of soft robotic actuation with air was something I felt had both the ingredients of material play seen in the elastic toys, and the potential for a great expressive performance. I felt however I wanted greater control of the sealed chambers. In the next step I therefore decided to make my own forms.
In this prototyping stage I begin customising my own forms. In soft robotics most forms are made from moulded silicone for it provides a very uniform and controllable shape. This is beneficial when a soft robot needs precisely controlled movements for functional means, for example picking up an object or moving a tentacle in exact directions. In my search for expressive dexterity however I was more interested in how form and shape affects the movement and aesthetic output. I therefore chose to use the method of latex painting over hand made clay moulds. This allowed me to control playful features.

**On Latex**

Latex allowed me to explore playful provocation with form and texture. Firstly, it is very skin like, and I wanted to enhance this feeling by adding abstract body features such as nipples and folds. This was a deliberate play with context, contrasting with the very non-bodily aesthetics needed to create airtight seals with brass lures and engineered components. I also wanted to keep this form ambiguous and not too comparable to exact human body parts. If the form was to have one nipple for example it would be too close to a breast. By adding lots, it becomes something like a breast, but also like cow’s udder or even a strange alien creature.

**Prototypes**

Latex Texture and Forms

PROTOTYPE

Latex Texture and Forms

**Moulds made from clay set on aluminium tubes. The tubes provide the position of the air input. The clay is left to dry until it begins to crack a little. Chalk is then used to cover the clay to allow for easy release later on.**

**The image here shows a mould with 4 air inputs. Latex is painted on the mould in thin layers with 30-45 minutes between layers for the latex to dry.**

**After approximately 7 layers the clay the skin can be removed.**

**To remove the clay from inside the aluminium tubes are removed and the clay should be cracked using a hammer. The cracked clay pieces are then gently pushed out through the air inputs, taking care not to split the latex.**

**Sketching forms, with a double chamber**
On Increasing the range of Movement and Deformation

The folds allow for the shape to expand beyond just the natural elasticity of the Latex. Under vacuum they retreat and form tight skin like wrinkles, when inflated the form allows for a very expressive expansion and retraction of shape by only using air.

The relatively non-precise method of painting latex means thin areas expand disproportionately. This adds a fragile life like feeling to the objects, and an unpredictable and surprising deformation.
Air Inputs and Sensor Inputs and Potential for Interactivity
By increasing the number of air inputs I was also opening up the option of having sealed chambers within outer chambers. This gives the ability to control the surface form. For example by inflating an inner chamber, and applying vacuum to the outer chamber the outside skin is sucked in forming tight wrinkles.

The cavities inside also allow for sensors to be inserted into the objects. For example air pressure sensors that read how much the objects are squeezed or light sensors that read the light increase as the chambers are inflated and the latex thins, thus letting more or less light through. This would also be affected by people’s hands covering the object and blocking light.

These examples show how these objects have the potential to truly interactive.
Proposal: Performing Objects

I propose we look to the stage for both inspiration and context as an interactive area for designers to propose and suggest future interactions.

By framing my objects as performers we can assess their capability to play with a participatory audience using aesthetic provocation of movement, texture and form. I used the Konstfack spring exhibition as the setting for a playful performance called "Elastic Interactions of The Machine Age". Giving each of my latex objects their own stage. Each with their own features and expressions.

The stage aesthetic was deliberately clean and open showing the tube links to the machine. Materials of brass and birch were chosen in deliberate contrast to the absurd latex performers and the stages were set at different heights and angles so the audience would have to walk around and investigate the performance form many angles.
Proposal: The Machine and Script

The Machine
In the background was a central and very visual computer (Arduino) powered machine. This functioned to blow and suck air from the five latex objects and their chambers using a combination of solenoid valves and vacuum pumps. It was also a very strong visual component to the performance. Physically connecting the organic, and non-tech expressive and playful objects to the contrasting world of technology and function. This link is strengthen by the fact the silicone tubes are attach the objects to the machine.

Why a Machine?
Throughout the process I have been using manual techniques to prototype the movement and temporal form. This was always a replacement for what I claimed could easily replaced by machine actuation. For the performance the machine was built to prove it was possible to use computer programmed actuation to drive these playful objects, whilst also giving some context for the audience.

The Script (Arduino)
To replicate the prototyped temporal form with manual techniques there needs to be a script for the performers, telling them exactly how to move to get the most out of their playful dexterity and the actuating hardware (pumps and valves). The movement script for the machine is written in Arduino code and this is where my knowledge is lacking. The performance had five performing latex objects but the focus was on coding (writing the temporal script) for the main expression protagonist object set on the podium.
Proposal: The Protagonist

On a prominent podium next to the project description sat the object that had the most detailed script and programme. Throughout the following cycle the lamp inside the object is erratically flicking, warming the object up and giving the impression it is coming to life with the glow shines through the red balloon with an intense red hue.

**Stage One, Birth:**
Hard Vacuum and erratic vibrating of folds.

**Stage Two, Stretching:**
Inflating outer chamber, quickly expanding the form.

**Stage Three, Heartbeat:**
Pumping of the inner chamber using the solenoids to give a heartbeat effect, the tempo of which would slowly increase.

**Stage Four, Anxiety:**
The heartbeat gets rapid and the object begins to shrink as the vacuum in the outer chamber overcomes the pressure of the inner chamber.

**Stage Five, Death:**
With a sudden last inflating breath and hard vacuum, the object wrinkles and dies.

The script in this case is predetermined. However by suggesting in the project description that the objects are interactive the audience picks up the objects with the understanding that they are affecting the lifecycle and emotional expression with their movements and actions such as squeezing holding and caressing. The intention here is to play with the audience, by allowing them to believe they are killing or resuscitating the objects. Thus illustrating the potential of these objects to enact the darker side of play.
Proposal:
The Performers

Each of the other performing objects were deliberately absurd in their form and their movements were less scripted due to the restrictions of the machine and my own coding ability. They were therefore much more ambiguous. They also interacted with each other as they were partially driven by the machine and partially by each other. For example when 'Excitable Harry' was squeezed 'Punchy Folds' would suddenly expand. It was up to the audience to interpret this and play with the objects to understand how and why they were moving.
Summary and Reflections

My methods and proposal, in the context of a performance, I believe showed my methods resulted in expressive objects that provoked playfulness with playfulness. The protagonist predictably provoked the strongest reactions, especially with the heartbeat. The participating audience reacted very physically and held the object like it was a small animal. Commenting on how it felt like it was panicking or dying. Asking what they needed to do to keep it alive as it shrunk and vibrated. Some people talked of feeling ‘guilty’ holding it whilst others found pleasure in discussing whether it was a ‘small frog’, ‘throbble testicle’ or a ‘beating organ’.

Trying to understand the patterns of what was happening and when was also a theme; ‘now this one is moving!’ or ‘squeeze this and this one moves...’

One unintentionally strong aspect of
the performance was the introduction of sound as an element. This is perhaps something I could have worked with more. The sound that affected the performance was when the solenoid valves were turning on and off to control the air flow and direction for the heartbeat for example, there was a loud ticking that would decrease and increase in correspondence to the beats. Furthermore there was the eerie and synchronised hum of the vacuum pumps as the motors reacted to the varying voltages dictated by the Arduino code. This certainly added to the strange atmosphere of the performance but perhaps drew more attention to the machine and its workings than I would have wanted.

A Performative Speculation to the Future of Material Interaction.
The methods outlined in this thesis are designed to expand the methods for a playful approach to interactive objects. Contextualising the resulting objects within an interactive performance is a suggestion for exploring the diverse and expressive nature of these objects.
Ultimately I believe the methods for creating performing objects for the stage gives designers a unique opportunity to test out speculative ideas of future interaction. An interesting continuation would then be to work closer with performing artists towards an interactive performance. Thus with a narrative and expression much stronger than that here. I believe combining this with Dunne and Raby’s, (2014) methods for using design a speculative future would be a good start. With this I believe we could design performances capable of inspiring new ideas and visions much like film fiction has inspired new innovation in the past.
Design For Contemporary Performance - informing and inspiring innovation.

Harvey Bewley
2nd May 2016 (1st draft)

Predictable, safe process, aimed at getting a marketable product out in the most efficient way.

NEW PRODUCT "INNOVATION"

How can this inform more widespread design?
A more real experience of film fiction informing future design.

Free from the constraints of product design innovating for the market (above). Performance can be challenging, provocative and surprising. They can be critical, they can be experimental. A performance can be used to stage ideas and interactions. Expressing the idea, engaging the audience.

TARGET USER/ CONTEXT

COLLABORATIVE DESIGN STUDIO
Focused on creating objects and ideas for contemporary performance designed for expression and audience experience/ interaction.

NEW TECHNOLOGY

NEW PERFORMANCE

NEW CIRCUS OBJECTS

NEW CIRCUS PROPS

NEW TECHNOLOGY

NEW PRODUCT "INNOVATION"

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References


