

Meridian Design Report

3000

Alexander J Richardson
Msc Creative Technology
University of West England
Filton, Bristol, BS16 1QY
alex.richardson-@live.co.uk
www.maverickmedia.org.uk
www.alexanderrichardson.co.uk

Abstract

Updated - 25/11/2018, This design report describes the creative process, research journal and prototype report of Meridian - a self directed brief created for my masters degree exploring immersive technology, fine art, user interaction, communication design, and computer vision. The focus of the project is pollution and is a metaphorical representation of how over-population in cities inherently effect our environment. The experience uses the mediums of immersive interactive animation displayed as an urban art installation in Bristol.

Author Keywords

Immersive experience; interaction design; communication design; computer vision; urban installation; animation; creative coding; environmental awareness.

Research, Design & Development Blog
researchjournal.s3-website.eu-west-2.amazonaws.com

Introduction

The plan for this project is to create a new path through the city, which can be used for more environmentally friendly modes of transport like a bike or walking, connecting two parts of the city with an easy route. The animation is supposed to reflect the impact we have on our environment through a visual and audio metaphor encouraging an enchantment of a beautiful new realm - powered by wind energy collected by the natural current of airflow created by wind passing through the tunnel.

Design Proposal

The following proposal was submitted 22/10/2018. The development of my project and outlines my intentions before finalising my concept and submission 06/12/2018. Throughout my research journal and prototype report my ideas evolve from my initial submission:

Pollution is like a modern-day plague, it is the biggest side effect of urbanisation and industrialisation. Global emissions of insidious chemicals are at an all-time high due to the copious amounts of consumerism in our cities.

Harmful substances are released into the atmosphere, water, and soil. This inevitably spreads to plants, animals and eventually us, thus deteriorating our natural environment due to the excessive neglect of our planet.

The most prolific pollutants include; Sulphur Dioxide, Nitrous Oxide, Carbon Monoxide, and Methane.

For my project, I have been investigating into how an ever increasing population, reliant upon consumerism negatively affects our planet.

Inspired by my research into interactive design and immersive installations, I will be presenting a project inspired by these mediums.

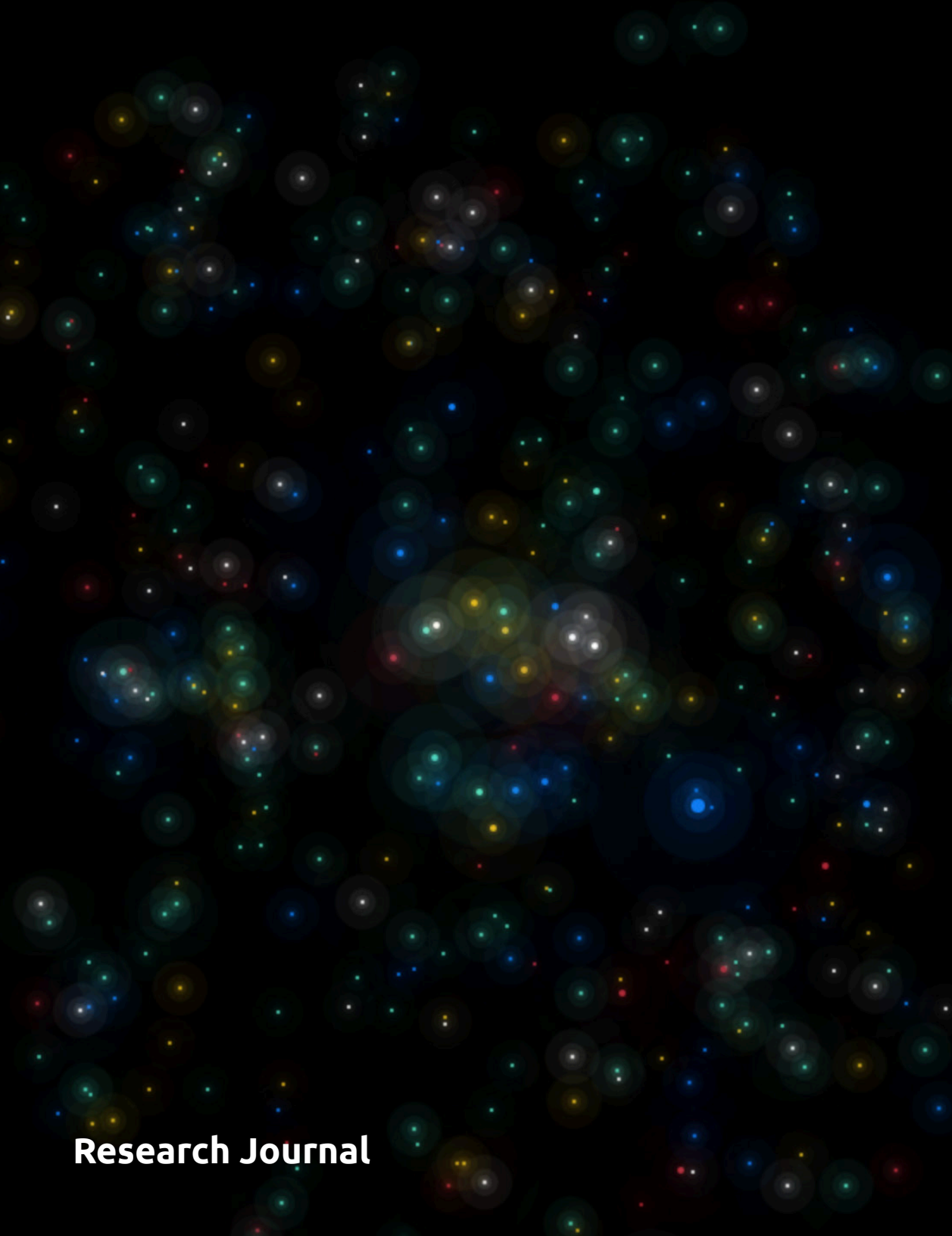
Projection onto a wall as my canvas, integrated computer vision, users can manipulate an animation. Creating a metaphorical representation of how population relatively affects pollution rates through an installation, that adapts depending on the number of people detected, each person representing a part of our growing population, intrinsically exacerbating to portray industrialisation.

Examples of the final outcome could be; the animation could diminish to greyscale, sounds of the city replace the sounds of nature. I could take my audience to another dimension by changing my display from 2D to 3D using fogscreen projection with a Raspberry Pi controlling a fog machine - depending on the amount of people detected - the more smoke produced. Smoke is representing the increasing levels of pollutants in our atmosphere, again it will be relative to the amount of people that are interacting with the projection. The fully immersive experience could be presented with another level in the 3rd dimension, bright coloured orb shaped particle to represent different pollutants in the air swarm around the people engaged.

The ideal location for my system is inspired by an adventure through the city at dusk where I set out to find where nature is and isn't in Bristol. Armed with my phone camera and my longboard, I explored the outreaches of my local area. Foraging for inspiration I meandered through streets, fields, cliff edges, river banks, urban tunnels, and underpasses. I would like my installation to be situated in an unused tunnel or underpass which, could be used as a cycle path or shortcut connecting two parts of the city to encourage greener modes of transport.

The working title for this interactive environmental project was "Playground". My intention is to metaphorically represent the destruction of our planet by creating an absorptive playground which, can be used to teach children about how our growing populations in the cities and abandonment of our natural world are creating a chaotic polluted concrete jungle while being fun and engaging like a playground.

To see the full development, design and research process please follow this link: researchjournal.s3-website.eu-west-2.amazonaws.com



Meridian formally known as Playground was morphed by critically reviewing my research and findings of appropriate pieces of work by artists, film makers, designers, and creative developers. I am demonstrating my understanding of contemporary practices, which inspire my work as I independently produce imaginative and innovative design.

The best inspiration comes from peers who encourage me through their creations. My research began by discovering the world of Spatio-temporal design, a system that uses time as a linear reference, a temporal dynamic segmentation method dynamically locating physical and virtual activities with human interactions through their space-time paths. It uses four different spatio-temporal patterns; co-existence, co-location in space, co-location in time, and no co-location in either space or time. (Yu, 2013)

In a lecture I was introduced to Camille Utterback's Liquid Time Series, which explores playing with space and time manipulating footage showing what has changed in previous frames by detecting optical flow semantically by detecting movement of viewers that interact with the space.

Figure 1. Meridian particles, one of the dynamic animations created for this project



In the same lecture we were presented a Japanese team of immersive artists known as **teamLab**. Inspired by their beautiful installations I decided to research into their project - Transcending Boundaries. Exhibited in London 2017 the team enforced their idea of removing boundaries in art by making the statement - **in the mind, there are no boundaries between ideas and concepts so why should there be in reality?**

Ambiguously influencing the way we interact, expressing in the real world it is necessary to have a physical material and in digital domain, art is able to transcend conceptual boundaries, fluidly interacting with and influence. (teamLab, 2017)

Figure 2. Image by **teamLab** - Universe of Water Particles on a Rock where People Gather 2018, Interactive Digital Installation. From the virtual three-dimensional exhibition held by teamLab in Tokyo considered as an “ultra-subjective” space where users interact with the flow of the digital waterfall.
www.teamlab.art/w/iwa-waterparticles

I went out to source local installations and took an excursion to the Combe Down Tunnel in Bath, Somerset. This project influenced my concept of creating an interactive footpath/cyclepath to encourage greener modes of transport. The tunnel consists of sensors placed at intervals which trigger sound and light installations which ominously react as people pass through a 12.5 mile decommissioned rail tunnel.

Bristol Museum & Art Gallery exhibited a collection of Hokusai and Hiroshige prints on from 22/09/2018 - 06/01/2019. Even though it was highly unlikely I would present a print for my final project I feel it is imperative to look at the history of art to understand the future.

Figure 3. Print by Hokusai - The Great Wave, estimated between 1829 - 1833



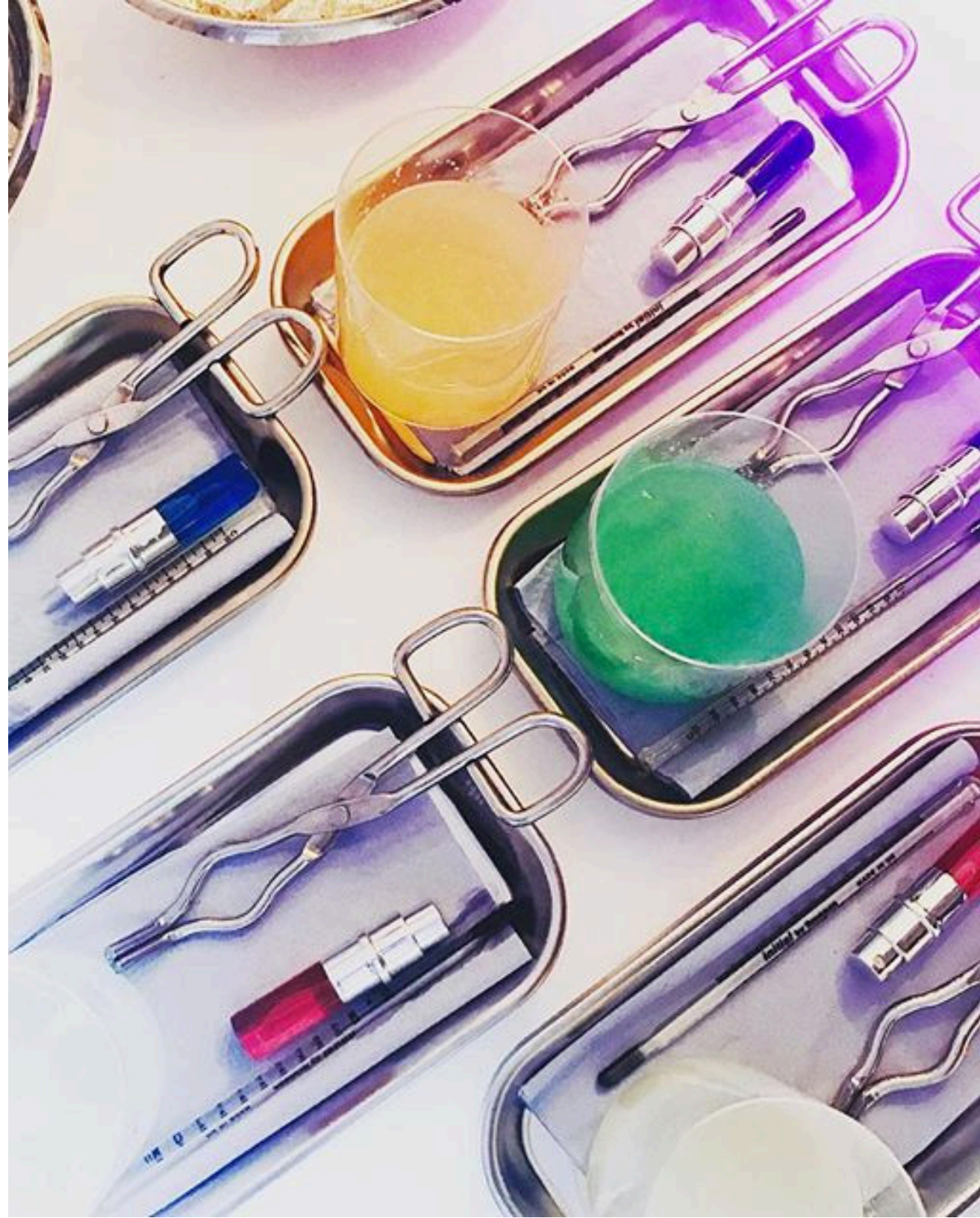
The biggest inspirations in life are the people we meet, especially the people who give us a chance.

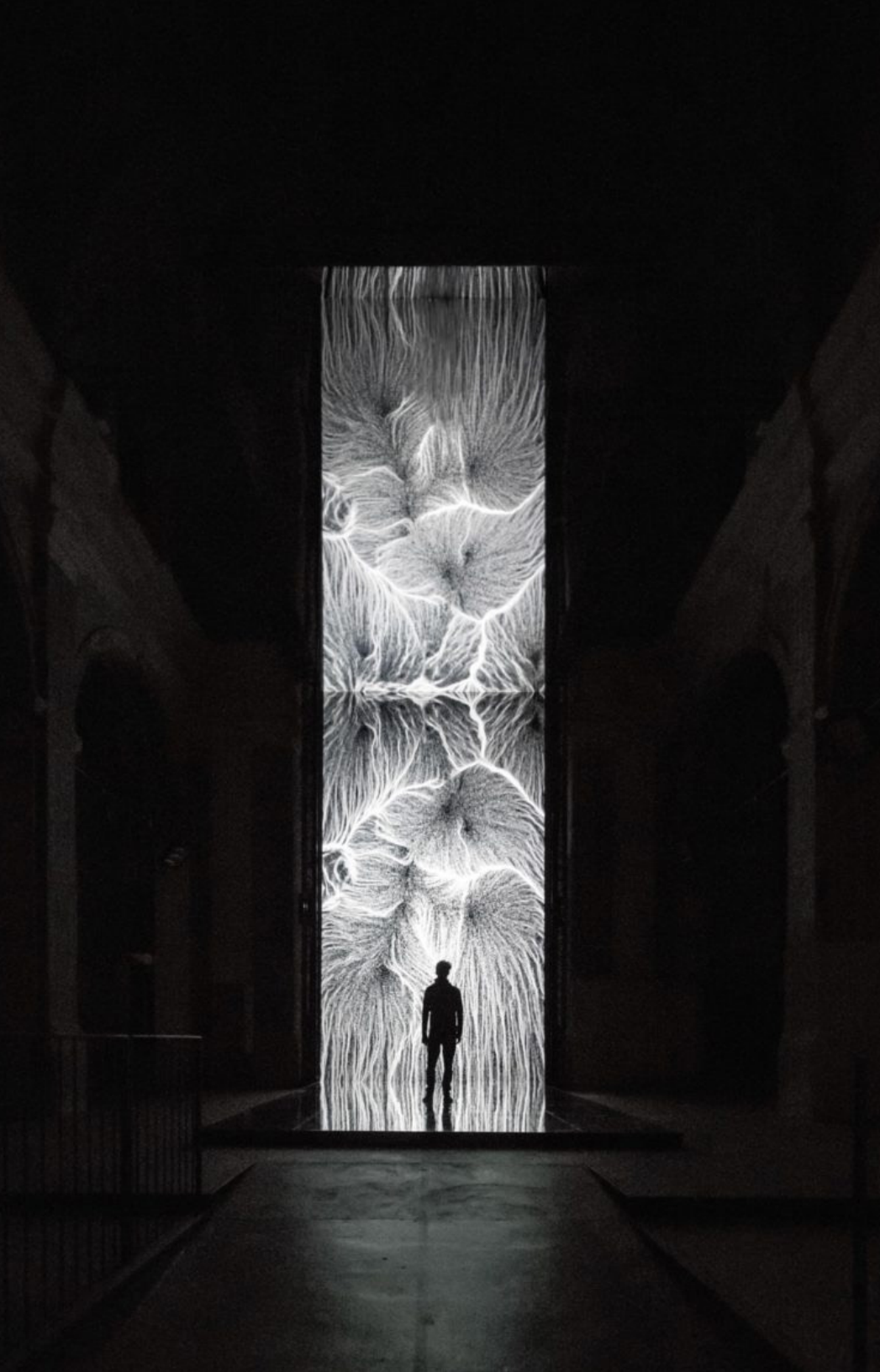
In February 2018 I was looking for my next freelance project, which consisted knocking on the doors of hundreds of creative agency in Shoreditch, London. During my relentless search I stumbled across the enterprisingly creative Sebastian Lyall; owner of the immersive cocktail bar experiences branded - Lollipop. I worked closely with his team creating websites and interfaces for his projects like; The Bletchly a vintage personalised cocktail experience set in the 1930's where the idea of a conventional bar is replaced with a theatrical code breaking and cocktail making experience.

Lyall is also responsible for the Bunyadi, London's naked restaurant. "I checked out London's naked restaurant and now I'm converted to eating in the nude" (Hooton, 2016)

The latest edition to Lollipop's portfolio is; The Grid, a dystopian cocktail experience where customers take on a fictitious evil AI, making drinks while actors and props set the scene for a fully immersive experience.

Figure 4. The Grid London website, via [Instagram www.thegrid.london](https://www.instagram.com/www.thegrid.london)





Multiverse - "A system composed of an infinite number of universes that coexist simultaneously outside of our space-time."
(Patti, 2018)

An audio-visual installation by fuse*, it is a sequence of generated digital paintings representing the eternal life cycle of infinite parallel universes projected 7.5 meters high on two large mirrors generating an infinite reflection.

A theory by Lee Smolin, is that our universe is one in a cosmos containing multiple universes, each born from the collapse of black hole, and because of natural selection our universe is in configuration following this reaction and our existence is the result of an infinite cycle of the birth and death of universes.
(Smolin, 2015)

Figure 5
Multiverse - creativeapplications.net



HALO - Sculpting the sunlight into (im) material form.

Created by Kimchi and Chips and currently on view at the Somerset House in London. The piece sculpts light with over 100 motorised mirrors that move in line with the sun and direct light from the sun to draw a halo, made visible by water jets creating the cloud of mist. (Visnjic, 2018)

Kimchi and Chips have created a hologram, which constantly evolves, formed by nature, materialising the immaterial, taking what cannot be seen but allows us to see, and made it visible.

Figure 6. Halo - creativeapplications.net

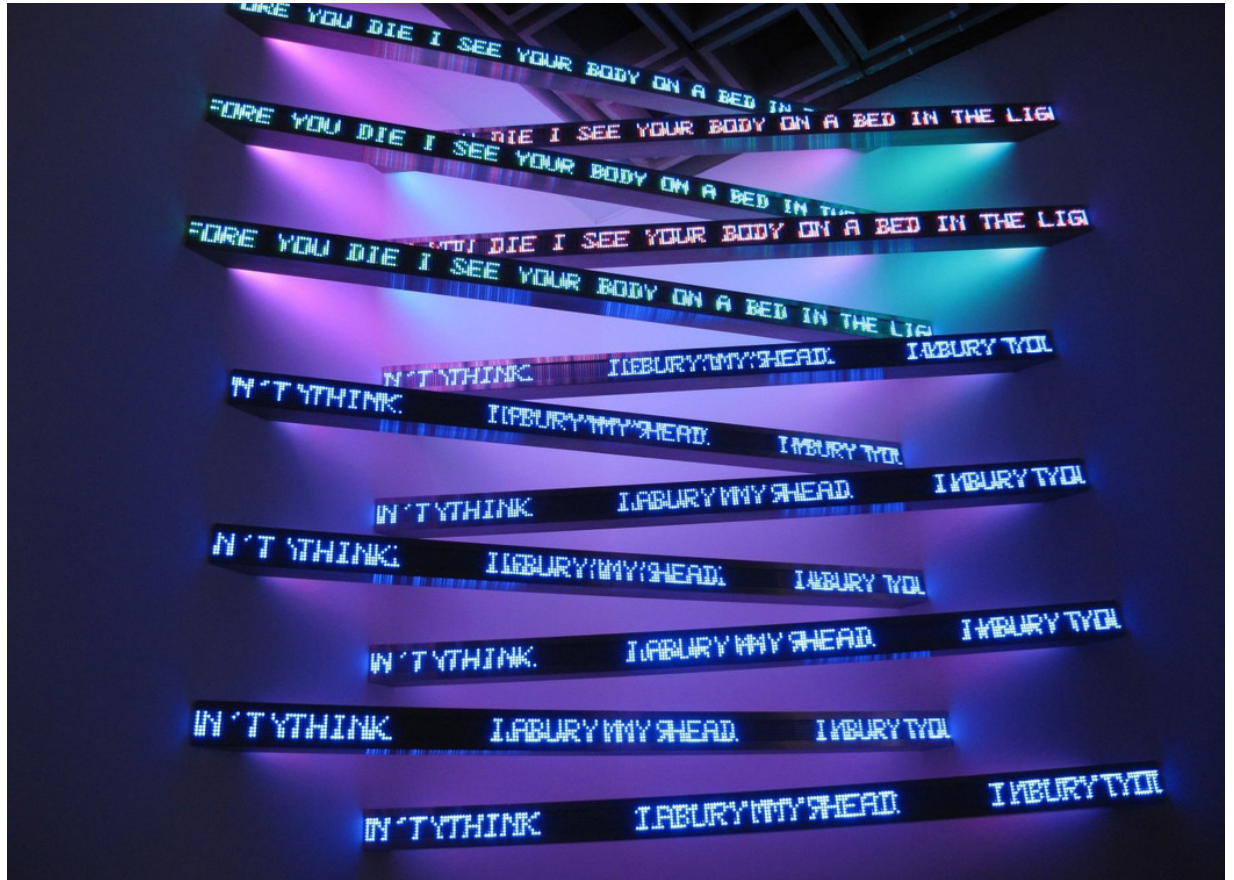


Heidelberg Project - is a guerilla street art environment in an impoverished residential area in Detroit. Started by Tyree Guyton, an artist who grew up in the neighbourhood after finding the street he grew up in derelict and abandoned in 1986. The idea is that all citizens of the neighbourhood have the right to express themselves creatively in their communities, turning a dismissal poverty stricken area into the cities biggest art installation.

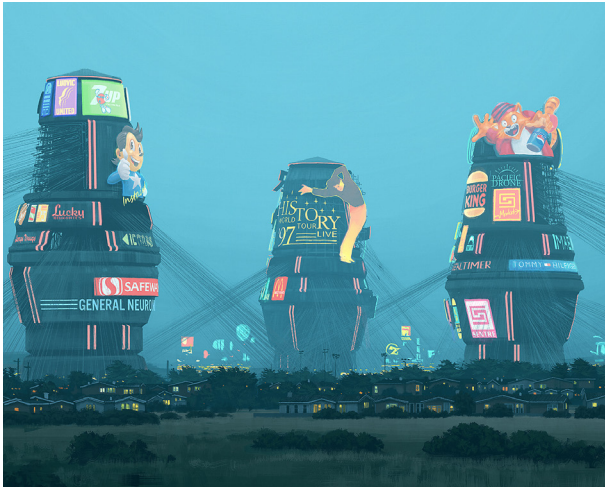
Figure 6. image by www.heidelberg.org

Jenny Holzer is an American artist who produces notoriously controversial statements that provoke strong responses. She produces work for the streets and galleries like Tate Modern and her current exhibition Artist Rooms.

Figure 7.8. images by Tate Modern, Jenny Holzer, ARTIST ROOMS www.tate.org.uk



“I wanted a lot simultaneously: to leave art outside for the public, to be a painter of mysterious yet ordered works, to be explicit but not didactic, to find the right subjects, to transform spaces, to disorient and transfix people, to offer up beauty, to be funny and never lie.” (Holzer, 2018)



Simon Stålenhag The Electric State

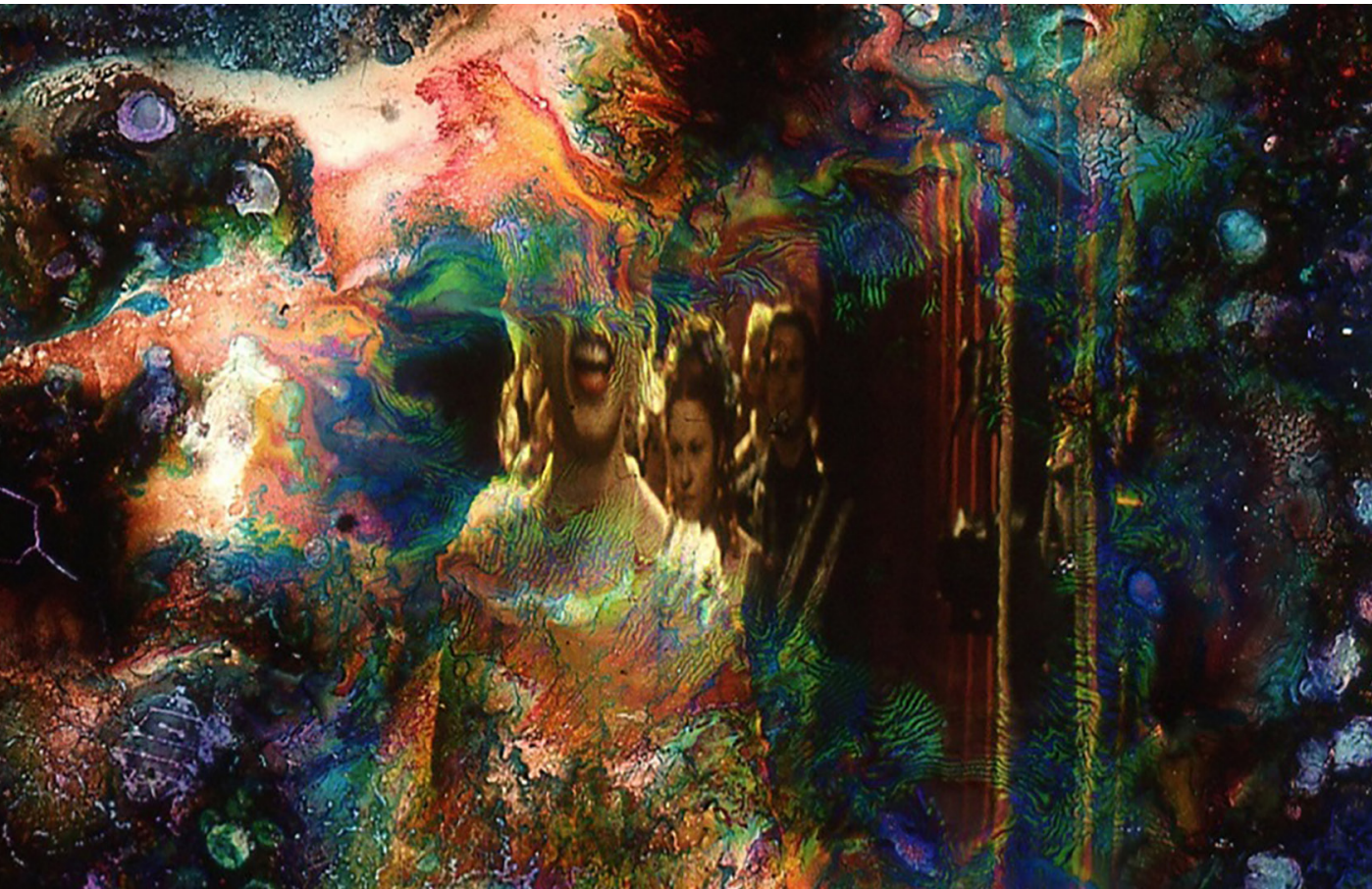
A fundamental part of the brief is that my design needs to be designed for children. For inspiration I looked to a book written in the perspective of a teenager and a robot who travel across a version of America in which something has gone profoundly, uncomfortably wrong.

“Being an adult for me is understanding that you are still a kid. I think that, for me, is the most adult thing you can do: understand that you’re a kid, but somebody has to pay the bills. There are people who think there’s something else to it, like “Something will happen! You will become a man!” Something like that. That never happens, and I think those characters... I don’t think they specifically symbolise adulthood, I think they symbolise conformity.



People choosing to be somebody that they’re not. They think they’re acting in a certain way, because that’s what society expects from them, and they expect to get a reward for it, but the kids—I mean I’m not sure they see through it, but they react to it. They don’t like it, and I remember that’s how I felt being that age. I waited for that thing to happen. Adulthood.”
(Stålenhag, 2018)

Figure 9,10. images by Simon Stålenhag, video-images.vice.com/uncategorized/1539136260269-simon-stalenhag-the-electric-state-01.jpeg



Felix Kalmenson
Psychedelic Art Made from Moldy Food.

These designs are made by cultivating mould from deteriorating strawberries and growing it on film. The reaction encourages colours to bleed into one another in strange, vibrant psychedelic patterns that look like oil slicks. While watching the footage, the images appear to corrode as the bacteria incideously distort the colours.

Figure 11, 12. images by Vice - This Psychedelic Art Made from Moldy Food Is Tripping Us Out
www.vice.com/en_us/article/zmw5n4/this-psychedelic-art-made-from-moldy-food-is-tripping-us-out





Poetic Kinetics
Nimbus by Patrick Shearn

Nimbus uses blue LEDs to illuminate duvet like material as a colossus installation transforming space into an elaborate 'look at me' performance. Silence is interrupted as motion sensors are triggered triggered supplying an audiological aspect to this beautifully static visual statement.

Figure 13. images by Poetic Kinetics
Nimbus [www.poetickinetics.com/
reflection-rising](http://www.poetickinetics.com/reflection-rising)

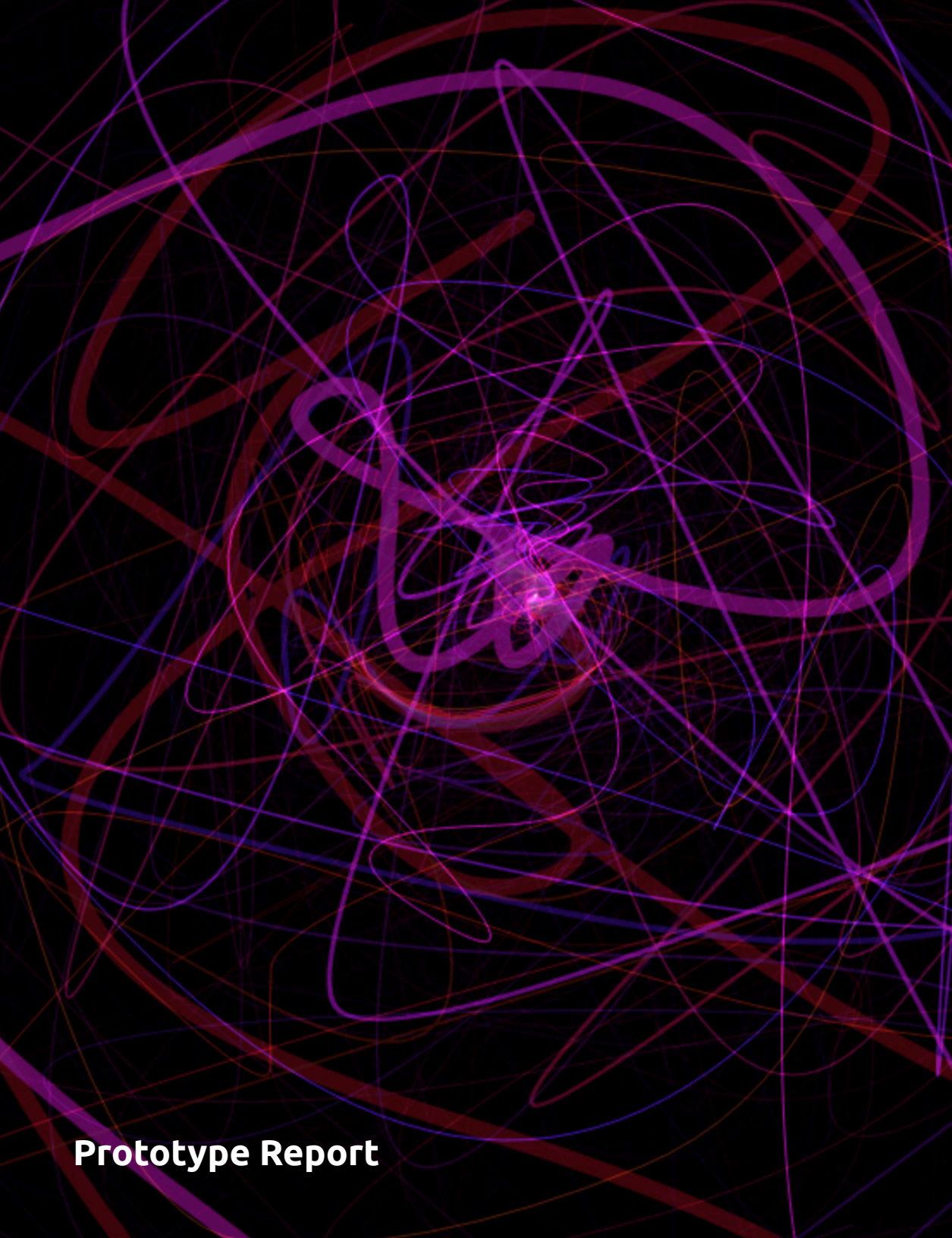
The World's First Intertidal Art Gallery Maldives

In The Maldives there is a submerged art gallery called Coralarium. The sculptures, designed by British artist Jason deCaires Taylor are habitable for marine life. Unlike a zoo where wildlife has been taken out of its natural environment this exhibit creates space for new life to live. In a way it is more

like an inverse of a zoo where the marine life come and look at the visitors. Built in a luxury resort it is an attraction built for scuba-divers to frolic amongst some of nature's most beautiful offerings.

Figure 14. images by artFido
www.artfido.com/the-worlds-first-intertidal-art-gallery-opens-in-the-maldives/





Prototype Report

“Do something. If it doesn’t work, do something else. No idea is too crazy.”
(Hightower, 2018)

Since the submission of my design proposal my ideas have transformed due to my research and the disparities between the final outcome and my initial concept are outlined in this chapter.

My working title for this project for 80% of the development process was ‘Playground’ until I re-branded the identity to ‘Meridian’ - “an imaginary line between the North Pole and the South Pole, drawn on maps to help to show the position of a place.”
(Dictionary, 2008)

The plan for this project is to create a new path through the city, which can be used for more environmentally friendly modes of transport like a cycling or walking, connecting two parts of the city with an easy route. The animation is supposed to reflect the impact we have on our environment through a visual metaphor encouraging an enchantment of a beautiful new realm - powered by wind energy collected by the natural current of airflow created by wind passing through the environment.

Figure 15. Meridian Rays, is a dynamic animation created for the project.



Figure 16. I considered 16 potential fonts I could use as the header and logo for my project. As a reference I looked at an article titled **20 Best Google Web Fonts** by Awwwards.com. www.awwwards.com/20-best-web-fonts-from-google-web-fonts-and-font-face.html

Meridian

Playfair display black

Meridian

Spectral bold

meridan

Avenir black

meridian

Ubuntu bold

meridian

Arvo bold

meridan

Poppins bold

Figure 17. I defined my font selection down to 6. After carefully considering each typeface I decided to go with Ubuntu.

Figure 18. Ubuntu is an OpenType-based font family, designed to be a modern, humanist-style typeface by London-based type foundry Dalton Maag, with funding by Canonical Ltd.

This contemporary typeface was only released in the last decade. Its sans-serif curved edges and minimalist structure reflect Meridian and is holistically used.

Ubuntu

Aa Ee Rr

Aa Ee Rr

a

Narwhal

a b c d e f g h i j k l m

n o p q r s t u v w x y z

0 1 2 3 4 5 6 7 8 9

Colour is not just how something looks, it is about the feelings, emotions and attitudes that a colour can induce.

Colour theory can help re-enforce my metaphor visually by gauging potential colour schemes of the city and nature. I plan to manipulate the hues dependent of the amount of people interacting with the project, displaying the city and nature using colour.

Figure 19 - Titled the city, a colour pallet I created with colours lifted from Pantones website: pantone.com

Figure 20 - Colour pallets titled Nature are taken from Deep Rooted and Forest floor, pallets that compliment Pantone's colour of the year 2017 - Greenery. They have organic hues found in nature: pantone.com

The City



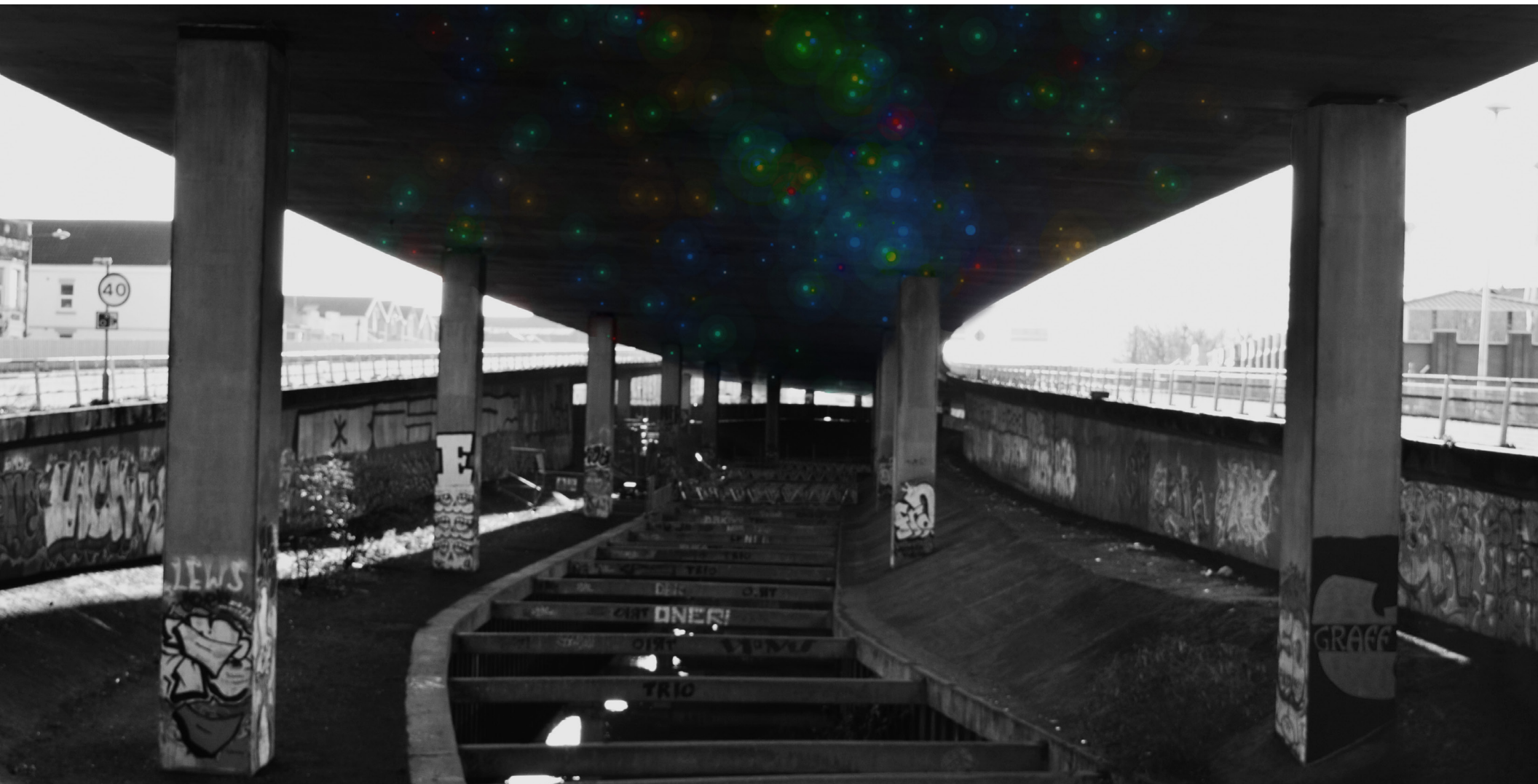
Nature



Figure 21 - The ideal location for Meridian is Eastville Bridge Under M32.

Under the M32 is a clandestine art gallery filled with some of the best graffiti pieces in the city, and to get too it takes crossing a motorway, climbing a barbed fence and crossing a 50cm wide girder over an ice cold sewage ravine. At the end of this needle infested slippery footpath is a handmade skatepark.

I feel this is an ideal location as the project is presented via a projector that works best in dark areas. Not only for its aesthetics a cyclepath or footpath integrated under the bridge as a direct route too the city centre could be a perfect environmentally friendly alternative to a motorway. It is integral that the skatepark and graffiti is preserved and left as is.



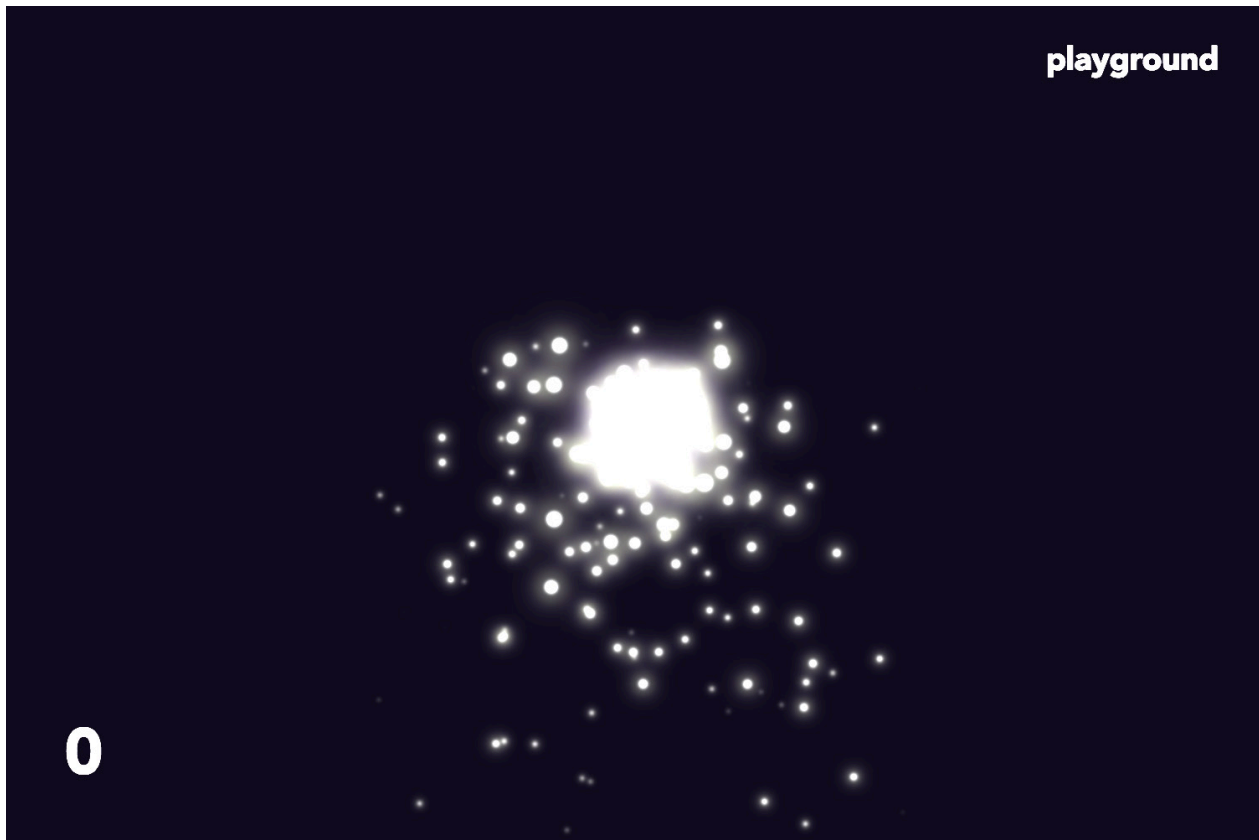


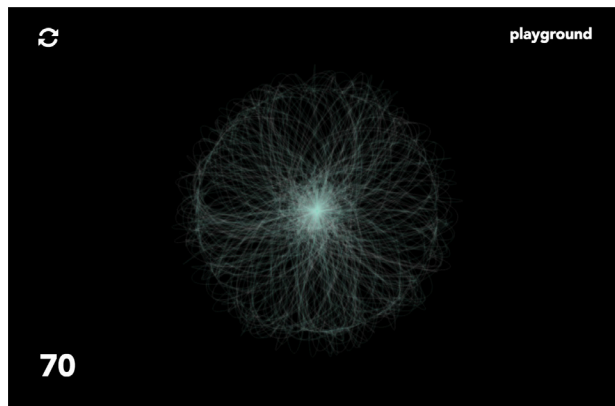
Figure 22 A screen shot of the animation titled: Snow, which is a glowing white orb which erupts flakes.

In our tutorials we have been using C++ to create object oriented projects. As a web developer by trade **Javascript** is the programming language I am most comfortable with using, so to theorise the code and start developing I used my initiative and used **Javascript**.

A fundamental feature in my project is reacting an animation depending on the amount of people detected. To understand this thematically I have created an animation which rotates faster depending on the value entered.

```
/* ORB 1 */
$(document).ready(function() {
  $('#input').change(function(){
    var val = $(this).val();
    var inputNo = (10 / val);
    if (val > 0) {
      $('#orb').addClass("rotating");
      $('#rotating').css("animation", "rotating "+ inputNo + "s linear infinite");
    }
    else {
      $('#orb').removeClass("rotating");
    }
    console.log(inputNo);
  });
});
```

Figure 23 is a code snippet that takes the input value as a variable called 'val'. It then checks if it is greater then zero, if it is not greater then zero nothing happens. If 'val' is more than zero it adds the class 'rotating' referenced in the CSS editing the amount of seconds the animation takes.



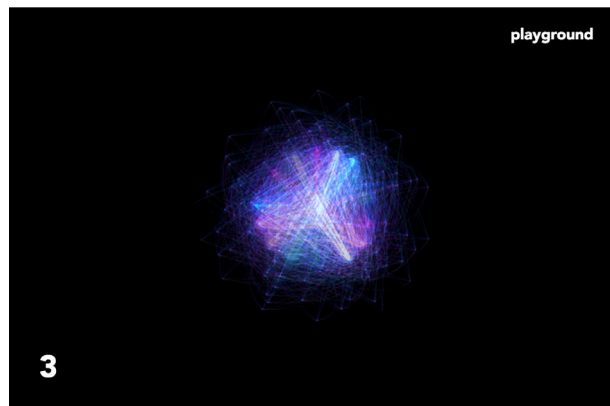
```

/* ORB 2 */
var val = 0(this).val();
var valHun = (val + 1 * 100);
var colour = "#ffffff11";

$('input').change(function(){
  var val = 0(this).val();
  if (val > 5) {
    colour = "goji">= "#57e0c111";
  }
  else {
    colour = "#ffffff11";
  }
  init(val);
});

var
body,
lines = [],
totalTentacles = valHun;

```

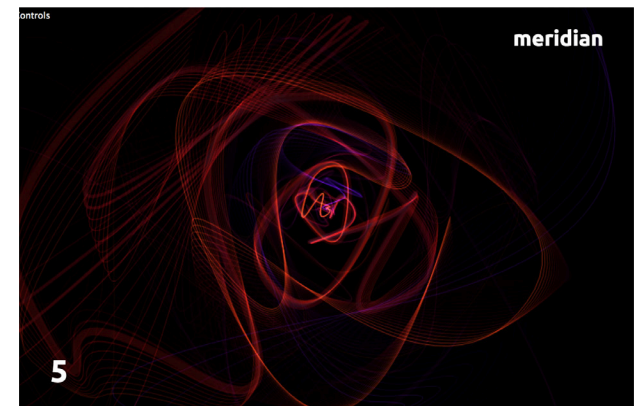


```

/* KALEIDESCOPE */
if(this.radius >= valHun){
  this.growRadius = false;
}

if (val == 0) {
  this.ctx.strokeStyle = '#ffffff';
}
else if (val == 3) {
  this.ctx.strokeStyle = 'hsla(' + this.rand(170, 300) + ', 100%, ' + this.rand(50, 75) + '%, 1)';
}

```



```

/* MERIDIAN RAYS */

function val() {
  newValue = document.getElementById("input").value;
  loadValue = newValue * 5;
}
val(opts);

var opts = {
  get: radiantSpan() {return (loadValue / 10)}
},

```

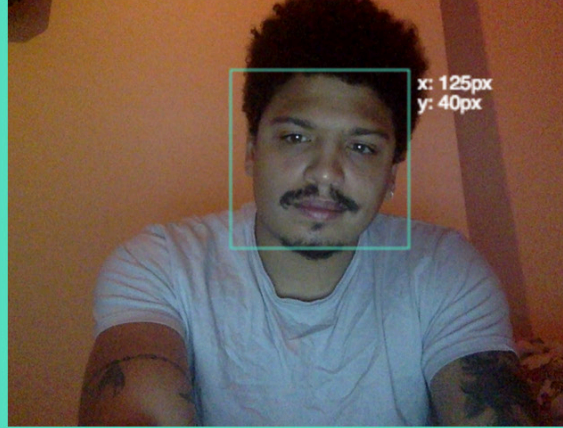
Figure 24, 25 Orb

Following on from my previous experiment still manipulating an animation with a dynamic variable using Javascript. The statement in the code snippet changes the colour of the animation if the number is greater then 5. The variable; valHun is the number input + 1 * 100 and changes the number of tentacles relatively.

Figure 26, 27 Kaleidescope

With this examples I am adjusting the colours and size of psychedelic kaleidescope with of two if statements. Chaning the radius of the object depending on the value entered and manipulating the stroke to white or randomised colours between two values.

Figure 28, 29 Rays - Light surges and pulses like lightning illuminating from the abyss. The snippet shows a function where I have used a getter which binds a function to an object property and uses the return value of that function each time the property is looked up to pass it into a new variable. The higher the value the less ridged the rays are, at 0 they are straight.



1

meridian

I decided to find a way of using computer vision with Javascript and found; Tracking.js. "A library that brings different computer vision algorithms and techniques into a browser environment."
(trackingjs.com, 2018)

Figure 30 Tracking.js has allowed me to use computer vision to detect faces. I can log the number of faces detected by tracking - event.data.length. I am now displaying the number of faces detected in the input field in the bottom left.

Figure 31 Then I am running an if statement that is the number of people detected is greater then 0 change the colour of the input field text. With this code I can now manipulate any animation.

```
/* COMPUTER VISION */  
  
document.getElementById('input').value = event.data.length;  
if (event.data.length > 0) {  
  document.getElementById('input').style.color = '#57e0c1';  
}  
else{  
  document.getElementById('input').style.color = '#ffffff';  
};
```


Computer vision manipulating Javascript variables controlling an animation.

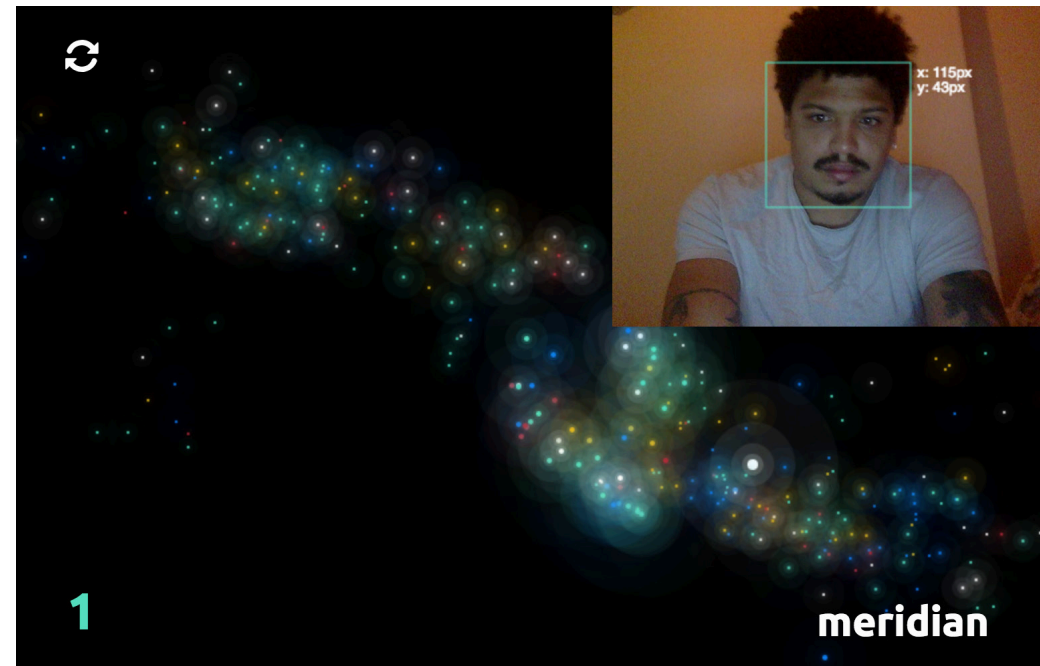
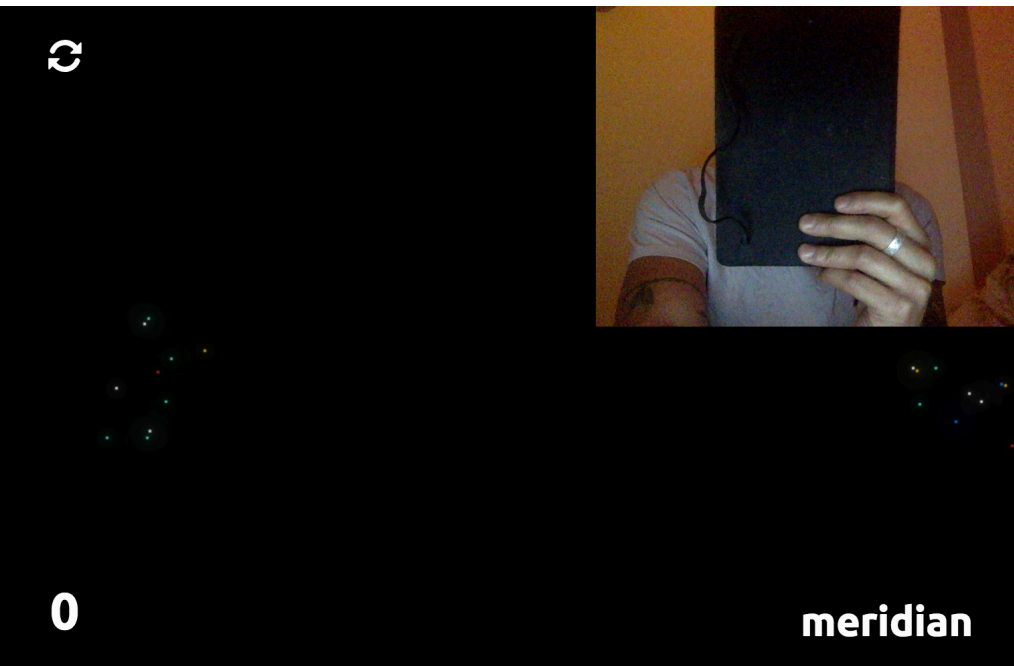
'Particles' is a visualisation of harmful substances in the atmosphere; Sulphur Dioxide, Nitrous Oxide, Carbon Monoxide, and Methane.

The theory enforcing my project is that the ever growing population of the cities is contributing to these insidious pollutants damaging our environment. Metaphorically I am displaying this theory, as the more people detected the more particles are visible.

Figure 31, 32 As shown in these screen shots, when 0 people are detected the particles are minimal, but when 1 person is detected a swarm of particles flow on the screen. The number of particles multiplies relative to the number detected.

Figure 33 The code snippet associated with this animation.

```
/* ANIMATED COMPUTER VISION */  
  
document.getElementById('input').value = event.data.length;  
newNumber = event.data.length;  
maxParticles = (newNumber) * 50;  
  
if (newNumber > 0) {  
  document.getElementById('input').style.color = '#57e0c1';  
  currentMax = newNumber * 300;  
  maxParticles = newNumber * 300;  
  emissionRate = newNumber * 10;  
}  
else{  
  document.getElementById('input').style.color = '#ffffff';  
  particles = [];  
  maxParticles = 25;  
};
```



References

Cambridge-University-Press, **2008 Cambridge Dictionary** www.dictionary.cambridge.org/dictionary/english/meridian

Hightower Jim, **2018 BrainyQuote.com** www.brainyquote.com/quotes/jim_hightower_116829

Hooton Christopher, **2016 The Bunyadi review** <https://www.independent.co.uk/arts-entertainment/the-bunyadi-review-i-checked-out-london-s-naked-restaurant-and-now-i-m-converted-to-eating-in-the-a7076871.html>

Holzer Jenny, **2018 Discover the powerful work of American artist Jenny Holzer** <https://www.tate.org.uk/whats-on/tate-modern/exhibition/artist-rooms-jenny-holzer>

Smolin Lee, **2015 The Singular Universe and the Reality of Time**, Cambridge University Press

Stålenhag Simon, **2018 Exploring the Uncanny, Sci-Fi Dystopias of Simon Stålenhag** waypoint.vice.com/en_us/article/bj43m5/exploring-the-uncanny-sci-fi-dystopias-of-simon-staalenhag?utm_source=vicefbus

Patti Federica, **2018 MULTIVERSE – The eternal birth and death of infinite parallel universes** <https://www.creativeapplications.net/maxmsp/multiverse-the-eternal-birth-and-death-of-infinite-parallel-universes/>

[multiverse-the-eternal-birth-and-death-of-infinite-parallel-universes/](http://www.creativeapplications.net/maxmsp/multiverse-the-eternal-birth-and-death-of-infinite-parallel-universes/)

teamLab, **2017 Transcending Boundaries** <http://pacelondon.team-lab.net/>

Visnjic Filip, **2018 HALO – Sculpting the sunlight into (im)material form** www.creativeapplications.net/environment/halo-sculpting-the-sunlight-into-immaterial-form/

Yu Hongbo, **2013 Spatio-temporal GIS Design for Exploring Interactions of Human Activities** <https://www.tandfonline.com/doi/abs/10.1559/152304006777323136>