



Dreamachine

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Keywords

*immersive
installation,
STEM, mental
health & wellbeing*

The beginnings of Dreamachine

Dreamachine is an award-winning, interdisciplinary immersive installation that combines neuroscience, music and white light to create a completely unique experience for every visitor with surprising wellbeing outcomes. It was developed collaboratively by producer of powerful large-scale participatory commissions Collective Act, Turner Prize winning artists Assemble, Grammy nominated composer John Hopkins, scientists and philosophers from the University of Sussex and the University of Glasgow and a team of technologists and sound designers. It was originally commissioned as part of UNBOXED: Creativity in the UK in 2020. From May to September 2022, Dreamachine celebrated four sell-out shows across every nation in the UK and is touring internationally in 2024.

Jennifer Crook, Artistic Director and CEO of Collective Act, found a blueprint for the original 1959 design of the Dreamachine by Brion Gysin, Beat Generation writer, poet and painter, in a second hand bookshop whilst she was a student. Over sixty years after its inception, Gysin's design for the 'first art work you can see with your eyes closed' was realised through a collaborative team including Anil Seth, Professor of Cognitive and Computational Neuroscience at the University of Sussex, Fiona Macpherson, Professor of Philosophy at the University of Glasgow and Director of the Centre for the Study of Perceptual Experience (CSPE) and Dr David Schwartzman, Senior Postdoctoral Research Fellow at the Sussex Centre for Consciousness Science. Jennifer had been developing the concept of Dreamachine for around eight years before the publicly-funded Unboxed commission was awarded, developing a growing team including her academic collaborators from the University of Sussex, artists Assemble, composer John Hopkins and sound designer, Christopher Schutt.

The open call for Unboxed came out in summer 2020, in the midst of the pandemic lockdown when the arts sector was dramatically under-resourced. The call had a short deadline that required cross-sector proposals involving collaborations across science, technology, engineering, art and maths. Unboxed were most interested in the nature of the teams, the individuals on those teams and how unique the collaboration was. Because Jennifer had been interested in designing a version of the Dreamachine for years, she had been researching whether the concept was being investigated by academics across the UK and came across David Schwartzman's name on a research paper at the beginning of 2020. Days before lockdown was announced, she met David Schwartzman and Anil Seth on campus at Sussex



Dreamachine Woolwich.
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University. Had this meeting not happened, the collaborative team behind Dreamachine would not have been in position in time to prepare the bid for Unboxed. Over 300 applications were whittled down to 30 shortlisted collaborative teams, who were given funding for a ten week research and development phase in order to develop a concept to be pitched to a panel.

After the Unboxed Commission was awarded for Dreamachine to be one of the final ten projects, Jennifer (who has a wealth of experience in large-scale art installations) formed Collective Act and recruited 18 staff over two

months. Simultaneously, other key partners in the collaboration were also building their teams - the universities recruited PhD students to work alongside them on data collection and evaluation, and Collective Act were recruiting partners across the UK to produce it in their nations, eventually working with the Northern Ireland Science Festival, Edinburgh Science Festival, Edinburgh Festival, Cardiff City Council, and the Royal Borough of Greenwich Council and Woolwich Works. Jennifer notes that 'everything that we did was in partnership. So our collaboration wasn't just within a team, it was within a wider ecology of the organisations that helped deliver this and make it happen simultaneously in all the nations of the UK.' A learning programme was also developed in collaboration with New Direction, a charity that specialise in arts and culture in schools.

What is Dreamachine?

An immersive sensory installation that invites participants to experience the potential inside their own minds, Dreamachine is a seated, multisensory experience with 360 degree spatial sound. It resembles a secular temple with up to 32 reclined seats all facing towards the centre of a circle. Participants leave all their possessions at the door, before being invited to close their eyes and relax under a blanket, whilst listening to a bespoke stereo soundtrack composed by John Hopkins. White flashing light is then projected at varying frequencies onto closed eyelids. A level of deep relaxation ensues and moving patterns of kaleidoscopic colour appear behind closed eyes. Sometimes images of animals or humans appear, sometimes landscapes, sometimes cities or shifting, pixelated waves of colour. The phenomena is linked to something known as entrainment, gentle changes of brain activity which are created through synchronisation to flickering light. The light provides a beat for the rhythms of the brain, similar to the alpha rhythm, which is a brain state anomaly in which one is alert but relaxed. It affects the visual areas of the brain, and thus fantastical and completely unique patterns and designs appear. No one experience inside the Dreamachine resembles another, and thousands of participants have recorded their visualisations in a collection of drawings displayed on the website. This phenomena was first discovered in the 1950s by a pioneering British neuroscientist called Dr. Grey Walter, but cognitive neuroscientists at the University of Sussex have been researching this for a decade and the question of why flickering light gives rise to these experiences behind closed eyes remains unanswered.



Dreamachine Participants.

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Over 50,000 people have experienced the Dreamachine, and around 20,000 of those people created images of their visualisations in the reflection areas, which encouraged both communal and individual reflection through drawing, writing and use of a digital tool. The drawings created by participants were primarily intended as a reflection tool for the public to creatively express what they saw and share with other people, but they have become a research dataset in their own right. A PhD student is now working with that dataset, in order to categorise and analyse 20,000 hand drawn pictures, potentially through the use of an AI tool.

Partnership working

The collaborators attended team meetings every week for two years, working to a tough brief and very tight timescales. Within this context, Jennifer needed to find the optimal way for a cross-sector, interdisciplinary team to work together; how to get a consciousness scientist, a group of architects, a philosopher, a musician, and a technologist to speak each other's languages? Where was the meeting point between their different backgrounds? Jennifer quickly learnt not to waste time on the definitions of roles and expertise. Dreamachine needed to facilitate the expertise of everybody on the team in order to create something bigger than the sum of its parts, so the

collaborators had to leave the baggage of their disciplines at the door. Artists were invited to think like scientists and scientists were invited to think like artists, and the challenge for the technologists was that their work was to be invisible. The challenge for the artists was that their craft served only to enhance and shape the audience journey. For the scientists, the challenge was posed in how to make cutting-edge research feel a million miles away from a lab experiment.

Although collaborators did stay within their fields of specialism for detailed work, everyone was involved in conversations around the form and delivery of the experience - so that it might create a meaningful experience for the audience whilst simultaneously producing new scientific knowledge. As Jennifer attests, 'we were learning from each other and it became a really essential collaboration between the neuroscientists and our technologists to ask: how do we design what we know about the brain into what we're doing with the lights? And how do the lights need to respond to what we know about neurology?'

Installation ©2020 Collective Act

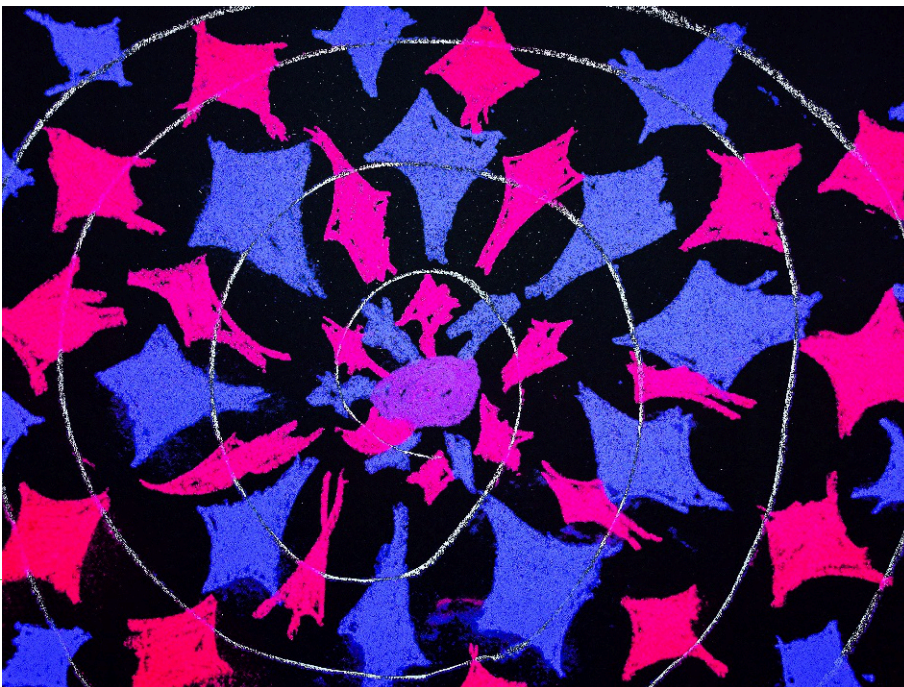


It should be noted here that the collaborative team were designing something unprecedented, which nobody had attempted before at scale. 'Designing in the dark' was a phrase that was used, because they were working with a black box and a brain, unable to see what other people see, trying to find a

way of evaluating something intangible. In addition to these design challenges, the Unboxed commission had a compressed timetable. The stages which would normally apply to a big project like this and usually take four or five years (including multiple design stages, research & development and staggered evaluation stages) had to be completed within 18 months. In order to deal with this, the collaborators employed a version of the scientific method to track what they were changing, measure the effect of those changes, evaluate it, and then decide what to do next.

Health & wellbeing outcomes

The Dreamachine experience is inclusive and welcoming, and participants' wellbeing is a priority throughout. Visitors are greeted by 'Guardians' who play a key role in ensuring a positive Dreamachine experience and supporting the audience's journey. All 92 of the 2022 Front of House staff were trained in disability awareness, empathy and mental health first aid. Everything from the language used, to the shape and design of the space is inclusive and uniting.



*Audience drawing ©2020
Collective Act*

Many visitors to the Dreamachine have described profound emotional responses; one visitor reported that the experience had such a positive effect

on his mental health that he visited Woolwich Public Market 27 times. The extent of beneficial responses that were reported to the Dreamachine team came as a huge surprise to Jennifer, who had expected a small proportion of visitors to experience increased wellbeing outcomes. In reality, the team received so many positive reports of increased wellbeing that a team at the University of Sussex are now developing a new research programme to explore how the technology underpinning Dreamachine could form novel interventions for mental health conditions, including depression and anxiety.

As Jennifer describes it, ‘Dream Machine inverts the spectacle of the immersive experience. It uses technology to connect us with ourselves. And rather than being something that’s designed from the outside, it’s an enabler for something on the inside that you come in with. And if you look at the drawings, and the reflections shared by our audience, they tell this really powerful story about our instinctive human drive to connect to something bigger than ourselves. And they also hint at our extraordinary capacity, our depth and many of the audiences left with really profound questions about what it means to see if they can see with their eyes shut, and what it means to be if they can simply shift into this different state of awareness so easily and so quickly, and this hints at these bigger research questions around the mysteries of consciousness and human experience.’

Legacy

Dreamachine occupies a unique position amongst collaborative projects between Higher Education and the arts sector, because it has generated further research datasets and funded research projects. In the pitching stage, the Dreamachine team had identified that they wanted to do a major scientific research study featuring citizen science, and they pitched the idea of the Perception Census, which has since developed into the world’s largest citizen science study ever undertaken. The Perception Census investigates the unique ways we experience the world around us, and it ran online in tandem with the Dreamachine experience. In total 33,7880 people from 133 countries took part, making it the largest citizen science study ever undertaken. People aged 18 to 80 on every continent except Antarctica took part in the study, contributing to a growing body of scientific and philosophical data. The current phase of data collection is now complete, and the results are being investigated by researchers at the universities of Sussex and Glasgow.



*Audience drawing ©2020
Collective Act*

In addition to this, the 20,000 drawings created by visitors to Dreamachine constitute one of the largest collections of publicly generated artwork in the world. These drawings help to map and make visible the invisible, which is the diversity of patterns and colours and shapes that people experience from the same sequence of just white light. They are now being analysed by a research team of neuroscientists at the University of Sussex as part of their decades-long research into this phenomena.

The insights from the Dreamachine immersive experience, combined with the developing findings from The Perception Census, will support major new studies on the nature of perceptual experience, and provide a unique body of scientific and philosophical research that will be valuable to the fields of neuroscience, philosophy, psychology, and more.

Additional information:

Dreamachine | A new, one-of-a-kind immersive experience <https://dreamachine.world>

Pioneering Research - Dreamachine : <https://dreamachine.world/research>
Perception Census | Welcome dreamachine.world: <https://perception-census.dreamachine.world>

Listen to Jennifer speaking at our NCACE Policy Workshop on Creative Health & Wellbeing at: <https://on.soundcloud.com/svKxM>