

PENETRATING DEEPER INTO THE TEMPORAL LOBE

BARBARA NORDHJEM

CREW

CREW is an interdisciplinary collective of artists and scientists mainly based in Belgium. The composition of the group changes depending on the project, but the performances are always at the intersection between art and science. CREW has been combining theatre and technology since 1998 with Eric Joris as artistic leader. Their first immersive performance, "Crash", premiered in 2004. Since then, the group has been experimenting with hybrid performances and installations where story-telling, live elements, and human-machine interfaces come together. There is no traditional separation between the actors on a stage and the audience. Instead the visitor is guided through different settings where active participation is required. A lot of CREW's activities evolve around issues that are also currently being investigated by neuroscientists and philosophers. Themes such as the human mind, senses and our experience of reality are explored with "multimedia as a prosthesis". Apart from the performance group, there is also the CREW_lab which focuses on research related to immersive media and development of new technology.

I am always looking for art that messes with your mind and tricks your senses. The performance Terra Nova by CREW starts out as a perverted experiment with the audience as guinea pigs. In other words, I feel like I have come to the right place.

CREW is an interdisciplinary group of artists and scientists based in Belgium. Their performances incorporate new technological environments with live performance. Terra Nova can be experienced by 55 participants at a time. Before entering the performance space, we are all given headphones and divided into five smaller groups. During the first part of the performance, I am placed in a steel chair and can observe how other people are guided through an alternate reality. A line of people enters, wearing brown jackets and heavy backpacks. Their footsteps are slow and insecure, the outside world is sealed off by headphones and video goggles. Each person is accompanied by an actor. The movements of the actors appear to be orchestrated by a central person who gives directions by using gestures, as if they carry out a medical procedure or experimental protocol with care and precision. It looks like a scene taking place in a dystopian near-future society. "The fear of death is in the temporal lobe, we are going deeper", a monotone voice announces. The participants are then tied to wooden boards which are flipped backwards into horizontal position. On the sideline, we can also watch a video projection, images of narrow hallways, is there light at the end?

CREW, TERRA NOVA AT DEAF2012. Image by JAN SPRIJ 2012



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At some point, I am instructed to proceed into another room by a distant voice. I line up behind other group members and we enter a room with a bare-chested man. He tells a story about delirium and fatigue during a rough expedition to the south-pole. The central theme is our perception of reality and how certain situations can create a distorted view of our surroundings. This way, the polar quest becomes a metaphor for exploring the brain and our senses. After a dramatic mind trip involving penguins, snowstorms, and the frontal lobe, I finally find myself in the role of 'immersant': a traveller in a virtual surrounding. I am eager to try out the video goggles and see if I indeed will feel like I am somewhere in a different time and place. Perhaps a few people from CREW noticed one person continuously turning her head around after being 'plugged in'. The projection on the video goggles gives a partial view of the scene according to the direction I

turn my head. I can explore the environment as I look and walk around (or rather, I wildly bounce my head in all directions to see if the equipment can keep up). This direct relationship between head movement and vision really gives the feeling of being placed *in* the video.

Levels of reality

CREW collaborates with institutes for media technology to develop customized tools for immersive environments. The group works with 'omni-directional video' (OVD), which allows you to see surround video on a head mounted display (HMD). The places you are exploring as an immersant are pre-recorded while actors around you appear via real-time video filmed with a small head mounted camera. By using an orientation tracker placed on the immersant's head, it is possible to move

around in a multi-layered video environment. What appears to be one coherent view of the environment is created by combining 360 degree pre-recorded video, real-time video from the current environment, and metadata from the orientation tracker. Different recordings are merged into one unified scene where the immersant can move around and explore.

Unlike Augmented Reality (AR) and Virtual Reality (VR) there are no computer-generated virtual elements, but different layers of video recorded reality. VR takes place completely in a virtual 3D world, whereas AR allows you to see the real world with added virtual elements. What CREW presents is a form of mixed reality where video recorded elements from a different time and place are combined with elements recorded in real-time. In mixed reality there has been a strong focus on the visual aspect of the experience, especially in earlier VR scenarios where the

mind travels in a completely computer-generated world detached from the physical body. CREW takes a turn towards embodied technology and physical presence by combining video, sound, motion tracking, and tactile stimulation given by the actors.

Tapping into the senses

CREW takes a lot of experimental findings from cognitive neuroscience and puts them into practice in the performance. In the beginning of an immersion, you find yourself in a state of sensory deprivation. Visual references to the surrounding space are concealed during an initial period of complete darkness. To add to the loss of orientation, you are then strapped onto a standing bed which is slowly flipped backwards. This creates a very effective feeling of disorientation by mov-

ing the body around in space without any visual references. By shielding off visual input and relocating the body in space, the reference to reality becomes weaker.

It is already known that the brain is more likely to fill in information when there is no sensory input. Early studies in the 1960s and 1970s showed that people start to hallucinate when they are put into tanks where they are floating in complete darkness. More recently, there has also been an experiment showing some hallucinations after just 15 minutes of sensory deprivation. It seems like you begin to perceive your own reality in the absence of external input. In the case of CREW, the initial period of complete disorientation seems to create a heightened sense of presence by preparing you for accepting the new mediated reality. If you don't know where you are, you might as well be located in the video projection appearing in front of you.

Virtual body

Another tactic used to enhance presence – the feeling of *being there* – is to create a link between what is shown on the HMD and what you feel your body. During the immersion, you will see a virtual hand being touched via the video goggles and feel

your own hand being touched the same way. The combination of visual and tactile stimulation can create a powerful illusion: you start experiencing the virtual hand as your own. In other words, your sense of bodily self is moved into the virtual world, you feel like it is really you on the screen. This effect works with a principle called the rubber hand illusion (RHI), which has been used in several

'your sense of bodily self is moved into the virtual world'

scientific experiments. The participant's real hand is hidden and a rubber hand (or someone else's hand) is visible instead. Synchronous stroking and tapping of both the participant's hidden hand and the rubber hand creates the illusion that the rubber hand actually belongs to the participant. If stimulation is not synchronous, the illusion does not take place. You can try the illusion at home by putting a glove on the table and keep your own hand hidden under the table. Let someone stroke both the glove and the real hand in the same way at the same time. The RHI is an example of visual capture, where the visual sense dominates over other senses. You feel tactile stimulation on your body, but see it happening somewhere else. The brain has to integrate conflicting information with the result that the fake hand feels like a part of your own body.

Negotiating reality?

CREW tells a story about perception, the brain, and what we experience as real. It is a story about the mind and a poetic interpretation of scientific studies. A lot of fundamental questions are posed about who we are and what we believe is real. Can we trust our senses at all if our experience of where we are and what we perceive can be manipulated so easily? CREW states that neuro-philosopher Thomas Metzinger inspired the performance Terra Nova. The idea of our bodily self is something we take for granted and which we see as a fundamental part of being a person. Metzinger argues that how we experience ourselves is an ongoing process rather than something fixed and stable. The experience of being a person with a body and a mind is the result of neural processes and sensory information. When your brain begins to receive evidence that your body is located somewhere in a virtual world, that becomes the experienced reality.

It may be a disturbing idea that our perception of reality and of having a self is not stable but can be manipulated. At the same time, it also means that we are able to see and feel much more than what we may think. After the performance, I walk outside with my unstable self and my deceivable senses. I look down at my hands a second time to check that they are really mine. ■

Further reading

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Image by RENÉ PASSET

BARBARA NORDHJEM

I graduated in 2011 with a master's degree in Cognitive Neuroscience from the University of Leiden. Now, I am in the Visual Neuroscience Group at the University Medical Center in Groningen. I am generally interested in visual perception and how we are able to extract the most useful information from the environment in different situations.

I have a rather mixed background. Before I started my PhD research about different ways of seeing our surroundings and the neural mechanisms involved, I initiated a festival for live visuals and electronic music in Denmark and have worked at the media art institute V2_ in Rotterdam.