Guest post: Making memories

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by Wellcome Trust

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Pattern Completion (installation view), 2009, video projections onto suspended glass spheres

Over the last seven years sound designer **Tom Simmons** and I have created a series of short films and installations that describe experiences of memory and perception. I am fascinated by these fleeting, ineffable moments and by ways in which moving imagery – especially *projected* moving imagery – can go some way to express them.

In 2006, while I was making an animated film about the fragmented nature of memory, I met **Dr Hugo Spiers**, a neuroscientist at University College London. He introduced me to some of the scientific theories of recall and the fascinating and beautiful anatomy of the hippocampus, a tiny region of the brain that is important for memory.

When a memory is created, patterns of activity within networks of hippocampal cells become inscribed in their connections, leaving a trace known as an engram. It is thought that during recall, these patterns are re-activated until the trace is restored and the original activity pattern re-established.

This process, known as 'pattern completion', only lasts for a fraction of a second – that tiny moment just before a memory floods back to you. But if you were able to slow it down you would see that to begin with the activity of the cells is incoherent. It is only through re-activating the pattern again and again that the original, correct, pattern comes together.

Taking this concept as our starting point, Tom, Hugo and I created *Pattern Completion*, an audio-visual installation that explores ways in which networks of brain cells recall memories.

The installation echoes the process of pattern completion using sound recordings and photographic sequences captured in forests. The photographic sequences are projected into a constellation of suspended glass spheres, a cluster that echoes the arrangement of cells within the hippocampus. As the projections fall over the distributed glass surfaces, fragments of the forest scenes appear within their curved forms. The spaces between the hanging objects leave gaps in the imagery, much like the holes often left in our memories.

Binaural sound recordings are played back through headphones, providing precise spatial details about the forest surroundings. We wanted the installation to be immersive, for audiences to feel they were occupying an intimate and personal space. We purposefully left the sounds and images empty of people and objects, so that each viewer could complete or interpret the landscapes with recollections of their own.

We have written a computer program to fragment, shuffle and project the sound and image sequences into the installation space, determining when and where different visual and sonic details appear in relation to the different glass surfaces. The program mimics the iterative re-activation process that is thought to underlie pattern completion. In effect, this means that fragments of images and sounds appear to shift from one sphere to another – at one moment an image of canopy branches might fill the lowest sphere in the cluster, and the next it might appear in the sphere above.

The sound of that canopy will shift as well, appearing at first to be in the centre of your head and then in an area just above the eyes. The program is searching for the configuration of sounds and images that will make the scene topographically coherent, that will complete the pattern.

In this way our installation invites audiences to consider how the brain pieces together a memory and the implications this has for how our memories are structured. The work explores the complex nature of memory, the ambiguities between remembered and imagined places, the ephemeral qualities of our memories and the ways we use memories to define ourselves.

Bringing together an artist, a sound designer and a neuroscientist, this project has highlighted some of the differences between artistic and scientific approaches to memory. It has also underlined our shared fascination with remembering and forgetting. It has been intriguing for me to discover what actually happens inside our brain when memories are created and recalled. But this insight, rather than demystifying the process, has rendered the workings of the brain all the more mysterious to me, and all the more beguiling.

Michela Nettell with Tom Simmons and Dr Hugo Spiers

***Pattern Completion** will be on display at **Gimpel Fils** in London between 20–22 May 2010. A discussion of Memory and Place will be taking place on Saturday 22 May 4pm – 6pm featuring Michaela Nettell, Tom Simmons and Dr Hugo Spiers plus artist **Helen Maurer**, architectural historian and philosopher **Dr M Peg Rawes** and poet **Andrew McDonnell**.*

*For more information visit **www.pattern-completion.net***

***Michaela Nettell** is an artist and filmmaker based in London. She combines video and film projections with glass, water and mirrors to describe fleeting experiences of memory and perception.*

***Tom Simmons** collaborates with artists, musicians and scientists to create films, installations, performances and texts that explore ways in which we perceive and experience sounds and animated moving images. He is a Senior Lecturer and Research Coordinator at Norwich University College of the Arts.*

***Dr Hugo Spiers** is a neuroscientist at University College London. His research explores how we navigate space and remember the past. Currently his research group are examining how small constellations of brain cells contribute to mapping space and guiding behaviour.*

Image credit: Michaela Nettell and Tom Simmons

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