

# Psychic Computer Shows Your Thoughts on Screen

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Scientists have discovered how to “read” minds by scanning brain activity and reproducing images of what people are seeing — or even remembering.

Researchers have been able to convert into crude video footage the brain activity stimulated by what a person is watching or recalling.

The breakthrough raises the prospect of significant benefits, such as allowing people who are unable to move or speak to communicate via visualisation of their thoughts; recording people’s dreams; or allowing police to identify criminals by recalling the memories of a witness.

However, it could also herald a new Big Brother era, similar to that envisaged in the Hollywood film *Minority Report*, in which an individual’s private thoughts can be readily accessed by the authorities.

Jack Gallant and Shinji Nishimoto, two neurologists from the University of California, Berkeley, last year managed to correlate activity in the brain’s visual cortex with static images seen by the person. Last week they went one step further by revealing that it is possible to “decode” signals generated in the brain by moving scenes.

In an experiment which has yet to be peer reviewed, Gallant and Nishimoto, using functional magnetic resonance imaging (fMRI) technology, scanned the brains of two patients as they watched videos.

A computer programme was used to search for links between the configuration of shapes, colours and movements in the videos, and patterns of activity in the patients’ visual cortex.

It was later fed more than 200 days’ worth of YouTube internet clips and asked to predict which areas of the brain the clips would stimulate if people were watching them.

Finally, the software was used to monitor the two patients’ brains as they watched a new film and to reproduce what they were seeing based on their neural activity alone.

Remarkably, the computer programme was able to display continuous footage of the films they were watching — albeit with blurred images.

In one scene which featured the actor Steve Martin wearing a white shirt, the software recreated his rough shape and white torso but missed other details, such as his facial features.

Another scene, showing a plane flying towards the camera against a city skyline, was less successfully reproduced. The computer recreated the image of the skyline but omitted the plane altogether.

“Some scenes decode better than others,” said Gallant. “We can decode talking heads really well. But a camera panning quickly across a scene confuses the algorithm.

“You can use a device like this to do some pretty cool things. At the moment when you see something and want to describe it to someone you have to use words or draw it and it doesn’t work very well.

“You could use this technology to transmit the image to someone. It might be useful for artists or to allow you to recover an eyewitness’s memory of a crime.”

Such technology may not be confined to the here and now. Scientists at University College London have conducted separate tests that detect, with an accuracy of about 50%, memories recalled by patients.

The discoveries come amid a flurry of developments in the field of brain science. Researchers have also used scanning technology to measure academic ability, detect early signs of Alzheimer’s and other degenerative conditions, and even predict the decision a person is about to make before they are conscious of making it.

Such developments may have controversial ramifications. In Britain, fMRI scanning technology has been sold to multinational companies, such as Unilever and McDonald’s, enabling them to see how we subconsciously react to brands.

In America, security agencies are researching the use of brain scanners for interrogating prisoners, and Lockheed Martin, the US defence contractor, is reported to have studied the possibility of scanning brains at a distance.

This would allow an individual’s thoughts and anxieties to be examined without their knowledge in sensitive locations such as airports.

Russell Foster, a neuroscientist at Oxford University, said rapid advances in the field were throwing up ethical dilemmas.

“It’s absolutely critical for scientists to inform the public about what we are doing so they can engage in the debate about how this knowledge should be used,” he said.

“It’s the age-old problem: knowledge is power and it can be used for both good and evil.”

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