

THE PHILOSOPHY OF “THE MATRIX”

Posted on Monday, December 11, 2006 by Mo Costandi under Cinema, Neuroscience, Philosophy

In *The Matrix* (Andy and Larry Wachowski, 1999) Keanu Reeves plays a computer programmer who leads a double life as a hacker called “Neo”. After receiving cryptic messages on his computer monitor, Neo begins to search for the elusive Morpheus (Laurence Fishburn), the leader of a clandestine resistance group, who he believes is responsible for the messages. Eventually, Neo finds Morpheus, and is then told that reality is actually very different from what he, and most other people, perceives it to be.

Morpheus tells Neo that human existence is merely a facade. In reality, humans are being ‘farmed’ as a source of energy by a race of sentient, malevolent machines. People actually live their entire lives in pods, with their brains being fed sensory stimuli which give them the illusion of leading ‘ordinary’ lives. Morpheus explains that, up until then, the “reality” perceived by Neo is actually “a computer-generated dreamworld...a neural interactive simulation” called the matrix.

The Matrix is based on a philosophical question posed by the 17th Century French philosopher and mathematician René Descartes. One of Descartes’s most important theses was intellectual autonomy, or the ability to think for oneself. For Descartes, this entails not just having a “good mind”, but also “applying it well”.

Descartes knew that his sensory experiences did not always match reality, and used the Wax Argument to demonstrate how unreliable the senses are: the senses inform us that

a piece of wax has a specific shape, texture, smell, etc. But these characteristics soon change when the wax is brought near a flame.

Everything I have accepted up to now as being absolutely true and assured, I have learned from or through the senses. But I have sometimes found that these senses played me false it is prudent never to trust entirely those who have once deceived us... Thus what I thought I had seen with my eyes, I actually grasped solely with the faculty of judgment, which is in my mind.

Descartes was therefore suspicious of his percepts, the knowledge he obtained through his senses, and all his own beliefs. He became convinced that one must use one's *mind*, rather than one's *senses*, to obtain information about the world. In the system of knowledge constructed by Descartes, perception is unreliable as means of gathering information, and the mental process of deduction is the only way to acquire real knowledge of the world.

In *Meditations on First Philosophy*, published in 1641, he takes this idea to its limits, and comes to the conclusion that perhaps all of his experiences are being conjured up by this evil demon:

...firmly implanted in my mind is the long-standing opinion that there is an omnipotent God who made me the kind of creature that I am. How do I know that he has not brought it about that there is no earth, no sky, no extended thing, no shape, no size, no place, while at the same time ensuring that all these things appear to me to exist just as they do now? What is more, just as I consider that others sometimes go astray in cases where they think they have the most perfect knowledge, how do I know that God has not brought it about that I too go wrong

every time I add two and three or count the sides of a square, or in some even simpler matter, if that is imaginable? [but] since he is said to be supremely good...I will suppose...[that] some malicious demon of the utmost power and cunning has employed all his energies in order to deceive me. I shall think that the sky, the air, the earth, colours, shapes, sounds and all external things are merely the delusions of dreams which he has devised to ensnare my judgment.

Descartes therefore approached all knowledge, including his own, from a highly skeptical perspective. Despite his skepticism, Descartes, was certain that one could not be fooled about one's own existence, hence his famous dictum *cogito ergo sum* ("I think, therefore I am"). With this, Descartes meant that the only thing he did not doubt was his own existence, because the act of thinking about, and doubting, the reality of his perceptions was affirmation of his existence. By saying "I think therefore I am", he was defining 'truth' in terms of doubt.

Descartes's argument is an epistemological one. It questions the nature, limits and validity of human knowledge. Instead of inquiring into the nature of reality, Descartes questions his own knowledge and interpretation of reality. Using methodological skepticism, Descartes doubted anything that could be doubted, in order to lay a foundation for genuine knowledge. In terms of epistemology, much of our acquired knowledge is adequate to explain the world, but there is no such thing as "absolute" truth.

A modern version of Descartes' conundrum is a thought experiment called the 'brain in a vat'. This is Hilary Putnam's version of the argument:

imagine that a human being...has been subjected to an operation by an evil scientist. The person's brain...has been removed from the body and placed in a vat of nutrients which keeps the brain alive. The nerve endings have been

connected to a... computer which causes the person...to have the illusion that everything is perfectly normal. There seem to be people, objects, the sky, etc.; but really, all the person...is experiencing is the result of electronic impulses travelling from the computer to the nerve endings. The computer is so clever that if the person tries to raise his hand, the feedback from the computer will cause him to 'see' and 'feel' the hand being raised. Moreover, by varying the program, the evil scientist can cause the victim to 'experience' (or hallucinate) any situation or environment the evil scientist wishes. He can also obliterate the memory of the brain operation, so that the victim will seem to himself to have always been in this environment. It can even seem to the victim that he is sitting and reading these very words about the amusing but quite absurd supposition that there is an evil scientist who removes people's brains from their bodies and places them in a vat of nutrients which keep the brains alive.

The brain in a vat, although just a rehash of the argument by Descartes, is more directly related to *The Matrix*. In the film, the pods in which humans spend their lives represent the vat. The only difference is that, instead of just containing disembodied brains, the pods contain the entire body.

In theory, computers could simulate reality if the sensory stimuli corresponding to human experience could be determined and 'executed' as a computer program, which could 'run' in some kind of advanced brain implant. In practice, however, even if the exact computations required to generate a simulated constant stream of consciousness were determined, there is no computer in the world that is powerful enough to perform the necessary calculations. The world's most powerful supercomputer is not powerful

enough to process the visual information entering the eye of a fruit fly over a period of one second, let alone generate a stream of consciousness. Some people would, at this point say that, with the acceleration of processing speed and advances in quantum computing, computers may well have the power to simulate human consciousness in the foreseeable future. But that is another argument, which is beyond the scope of this post.

The notion, propounded by Descartes, that all our perceptions are false at first seems ridiculous, but it is, in fact, impossible to disprove. And Descartes was right to distrust his senses. Optical illusions are a good example of sensory stimuli that produce a discrepancy between what we see and what we experience, and there are numerous other examples, such as psychiatric conditions in which visual or auditory hallucinations are symptoms. In the case of optical illusions, we are aware of the discrepancy, but, otherwise, we do not normally question our senses. For Descartes, even the most basic assumption about reality was to be doubted.

Even when we are not looking at optical illusions, and perceive the world as we should be perceiving it, we are still being fooled by our senses. In neurobiological terms, “reality” is little more than a representational model of the world, a construct generated by multiple neural circuits acting in parallel. This model is based on sensory experiences received by the brain via the senses, which can detect only the narrowest range of stimuli. The human eye, for example, is sensitive to electromagnetic radiation with a wavelength of between approximately 400-750 nm (nanometers, billionths of a meter), an infinitesimal fraction of the entire spectrum. In that respect, the other senses are not much different.

Plato alludes to the narrow limits of the senses in this passage from *The Republic*:

Imagine human beings living in an underground, cavelike dwelling, with an entrance a long way up, which is both open to the light and as wide as the cave itself. They've been there since childhood, fixed in the same place, with their necks and legs fettered, able to see only in front of them, because their bonds prevent them from turning their heads around. Light is provided by a fire burning far above and behind them. Also behind them, but on higher ground, there is a path stretching between them and the fire.

Imagine that along this path a low wall has been built, like the screen in front of puppeteers above which they show their puppets...Then also imagine that there are people along the wall, carrying all kinds of artifacts that project above it – statues of people and other animals, made out of stone, wood, and every material. And, as you'd expect, some of the carriers are talking, and some are silent.

The cave-dwellers get a hint of reality from the shadows on the walls. They may see a shadow of an object, and construct a mental representation of that object. But, according to Plato, knowing the form of the object is not sufficient to have a full understanding of it, which can only be obtained by more direct experience. For him, the world as we perceive it is no more or less real than that perceived by the people in *The Matrix*, as neither we, nor they, actually have any direct experience of that world.

In *The Marriage of Heaven and Hell*, Blake reiterates Plato's argument, and refers directly to the cave allegory:

If the doors of perception were cleansed every thing would appear to man as it is, infinite. For man has closed himself up, till he sees all things thro' narrow chinks of his cavern.

For Blake, we are deceiving ourselves about our understanding of reality. Plato's argument, like that of Descartes, involves deception by other entities. Whereas Descartes believes he is being deceived by his demon about the nature of reality, the cave-dwellers are being deceived by the mysterious puppeteers behind the wall. 'Reality' for the cave-dwellers is little more than the shadows dancing on the walls. These are mere impressions of what lies behind the wall, yet the cave-dwellers use them to construct their models of the world, because it is the only information they have.

While we need not be as skeptical as Descartes, we should bear in mind that he was, to a certain extent, correct. But there are no malevolent forces deceiving us about the nature of reality. It is our senses and our brains which deceive us, the former by providing the extremely limited information on which our perception of reality is based, and the latter by using that information to construct models of the world. The truth – believe it or not – is that *we all live in a matrix*, albeit one composed of several hundred billion neurons and the quadrillion (10^{24}) or so synapses formed by them.

The Matrix is both thought-provoking and hugely entertaining. It shamelessly borrows from earlier sci-fi films, such as *Blade Runner* and *The Terminator*, but at the same time manages to remain original. For me, it is the hints of philosophy that make *The Matrix* so watchable. Like some others, I think that the film has more style than substance. The quality of that substance makes up for the quantity, but, like [Roger Ebert](#), I “wanted to be challenged even more” by the film. I would have liked the Wachowski brothers to explore the philosophical aspects a little further, but perhaps the film would have lost its commercial appeal if they had done so.