

# Shattered embodiment: Cyberspace as Cartesian Project

By Elke Müller

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## Abstract

In the Western world, we are still proceeding from a Cartesian worldview. In this paper I will illustrate that this dualistic worldview is objectified in Virtual Reality technologies. In order to illustrate this, I will first explain the main ideas of Descartes' *Optics* with respect to his vision on sense perception, space and the body. Secondly, I will compare the described topics of Descartes' philosophy with the phenomenological critique and alternative of Merleau-Ponty. These elaborations will serve as a background for my illustration. I will distinguish three kinds of virtual spaces, of which the CAVE seems to arouse the strongest kind of Cartesian ruptures, which I will refer to as experiences of 'shattered embodiment'.

## 1. Introduction

Cyberspace or Virtual Reality technologies are present in all shapes and sizes. Some examples are the Internet, multi-media CD-ROMs and video games. Despite their differences, all these technologies have in common the current debate in terms of practices that lead to 'embodiment' or 'disembodiment'. I would like to position myself in this debate by posing that people express their worldviews (which are either explicit or taken for granted) by 'objectifying' these worldviews in technological artefacts. In my opinion, the western world is still proceeding from a dualistic worldview, inherited by Descartes. This dualism is normally conceived as a mind-body dualism but at the same time, it can be understood as a subject-object (human-world) dualism. If it is true that people objectify their conscious or implicit worldviews in technological artefacts, it is interesting to see how this dualism can be found in the domain of Virtual Reality technologies. An obvious conviction would be that Cartesian practices lead to disembodiment straight away. I will investigate this assumption.

In the next section, I will describe the main dualistic characteristics in the work of Descartes. After that, I will make a comparison between relevant topics in the work of Descartes and Merleau-Ponty. Merleau-Ponty uses a lot of examples from Descartes' work, in order to criticise his philosophy and to give a different interpretation of the same examples instead. After having given a short explanation of these two worldviews, I would like to illustrate in which way our still dualistic worldview is objectified in Virtual Reality. In short, this objectified view causes 'dualistic' experiences, which can increase our sense of 'disembodiment'. But perhaps, it is better to speak of 'shattered embodiment', because our embodied experience gets reduced to certain senses and parts of the body. It can even suffer from unusual 'points of view' leading to dizziness, or time-lags which cause a feeling of being 'discentered'.

Given these short outlines, it will be no surprise that I prefer a phenomenological worldview in favour of a dualistic worldview. In the conclusion, I will give a deeper reason for this preference than the amount of rejections of Descartes' convictions and ideas can make clear.

## 2. Descartes' analysis of sense perception in *Optics*

In Descartes' dualistic ontology there are two kinds of substances. On the one hand you have *res extensa*: this refers to everything that has corporeal substance, like the world, stones and the human body. When Descartes speaks of 'bodies', he refers to everything which consist of matter in general. And like the Latin word says, material things are extended. On the other hand you have *res cogitans*. This refers to substances which do not consist of matter and are not extended. In other words, this refers to the mind,<sup>1</sup> to ourselves as 'thinking things'. Although the two substances are mutually exclusive, they do have a relationship together. The fact that there is a distinction and union at the same time between body and mind is very problematic in Descartes' philosophy. I will not elaborate on this further.

According to Descartes, material substance or bodies are extended in three dimensions: length, breadth and depth. Depth is made up from the first two dimensions. Extensions thus have a geometrical connotation. In fact, there is merely a conceptual distinction between Descartes' notions of extension (or: material substance) and space (1999: 227). Also follows that truly empty space like a vacuum does not exist. Space must always be filled, for example with air, even though we can't see air. In short, Descartes' notion of space is twofold: material on the one hand and geometrically understood on the other hand.

Descartes' philosophy can be understood according to two dualisms: a mind-body dualism and a subject-object dualism. I already briefly sketched the mind-body dualism in terms of two mutually exclusive but related substances. Now I will explain what I mean by a subject-object dualism. In general this refers to our knowledge and experience of the world and the object of that knowledge or experience. I would like to emphasise beforehand that Descartes is mainly focused on the way we gain knowledge of the world, whereas Merleau-Ponty stresses the importance of experience. One of Descartes' most interesting works to illustrate his dualistic ontology, is called *Optics* (*La Dioptrique* in the original French text).

In *Optics* Descartes states that "The conduct of our life depends entirely on our senses", and that "sight is the noblest and most comprehensive of the senses" (1999: 152, 283). At first glance, Descartes seems to contribute to what Martin Jay calls 'ocularcentrism' (1994: 3, 69), which means that Descartes' *discourse* is dominated by vision. The question remains, if his *philosophy* can be said to be ocularcentric too. As I will show, this question can be answered negatively. In *Optics*, Descartes uses four examples which I will use to explain and to illustrate his concept of artificial and human vision. These are the two sticks used by the blind man (2.1), his interest in telescopes (2.2), the engravings considered as pieces of art (2.3) and the equation of human vision with the camera obscura (2.4). In order to say something about the relationship between a (human) viewer and the viewed objects, we also have to take a look at Descartes' concept of distance (2.1.1).

Some of the examples I mentioned are understood by the notion of resemblance. Before I turn to the examples, I have to say that Descartes refused any notion of resemblance. Resemblance theories were addressed by Descartes to 'scholastic' philosophy which still dominated the early and middle seventeenth century. Not only did the scholastics believed "that there is something in the object itself that resembles the ideas we have of them" (Judovitz 1993: 72). They even believed that this resemblance is caused by our sensory perception. In short, the scholastics believed that little images were flitting through the air, the so called 'intentional forms' to make a resemblance in our mind. In other words: material objects transmit 'forms' or 'images' to the soul (Descartes 1999: 154). In answer to this, Descartes states that "We must take care not to assume (...) that in order to have sensory perceptions the soul must contemplate certain images transmitted by objects to the brain" (1999: 165).

One of his arguments to refuse notions of resemblance involves that we have to "recall that our mind can be stimulated by many things other than images – by signs and words, for example, which in no way resemble the things they signify" (1999: 165). The following somehow weakens his claim, when he says that "It is enough that the image resembles its object in a few respects" (1999: 165) – see 2.3. In the end he concludes "that in order to have sensory perceptions the soul does not need to contemplate any images resembling the things which it perceives" (1999: 166).

And: "But in all this there need be no resemblance between the ideas which the soul conceives and the movements [of the nerves] which cause these ideas" (1999: 167).

After this elaboration on Descartes' ideas on resemblance, I would like to consider Descartes' alternative *vision* on vision. At the beginning of Discourse Four of the *Optics*, called 'The senses in general', it turns out that Descartes is not the ocularcentristic philosopher some people hold him for – although his vocabulary can be labelled as such:

"Now I must tell you something about the nature of the senses in general, the more easily to explain that of sight in particular. We know for certain that it is the soul which has sensory perceptions, and not the body". (1999: 164)

And: "it is the soul which sees, and not the eye; and it does not see directly, but only by means of the brain" (1999: 172). Hence, what is really important in Descartes' philosophy is *touched* in these two quoted sentences: sensory awareness and 'to sense' in general refer to the internal and external organs (see note 6), but far more important seems to be what Descartes means by the term 'perception' i.e. the purely mental apprehension of things with the intellect. Reason alone decides if things are true and not the senses, who can deceive me. It is not that the soul or mind has sensory perceptions, says Descartes, but "it is through the nerves that the impressions formed by objects in the external parts of the body reach the soul in the brain" (1999: 164-165). In short the model works as follows: stimuli 'nerves' brain 'mind'. He says for example that "the movements in the nerves leading to the ears make the soul hear sounds; those in the nerves of the tongue make it taste flavours (...)" (1999: 167). Although "the soul is joined to the whole body, there is a certain part of the body where it exercises its functions more particularly than in all the others..." namely in the innermost part of the brain where it is seated, to be exact the 'pineal gland' (Cottingham 1994: 146). There exists a causal connection between the stimuli and the soul and vice versa, but I will not elaborate on the problematic causal transactions between the two different substances in this paper. It is now clear why sensory perception does not start with a resembling image that is sent to our head according to Descartes: it is by means of the movements of the nerves that my mind is composing a picture, signs, or words.

In short, sense perception must be understood as perception of the mind, as a mental act. But according to Descartes, we may not try to understand this as a reflective act, because a certain part in our brain is changed in order to let our mind judge what it really perceives (1999: 170).<sup>2</sup>

## 2.1 The two sticks used by the blind man

If you ever had "the experience of walking at night over rough ground without a light," you must have found "it necessary to use a stick in order to guide yourself". This

kind of sensation is somewhat confused however, compared with them who are born blind, because says Descartes, “one might also say that they see with their hands, or that their stick is the organ of some sixth sense given to them in place of sight” (1999: 153). In his book called *The world or Treatise on light* (which has been written before *Optics*), Descartes already posed that:

“Of all senses, touch is the one considered the least deceptive and most certain. Thus, if I show you that even touch makes us conceive many ideas which bear no resemblance to the objects which produce them, I do not think you should find it strange if I say that sight can do likewise”. (1999: 82)

In *Optics* the blind man with the stick is used as the first example to reject the scholastic idea of resemblance. The intentional forms earlier described as visual ‘transmitters to the brain’ can also be applied to feeling with a stick. Descartes says that when a blind man feels objects, “nothing has to issue from the bodies and pass along his stick to his hand” (1999: 153, 166, 169). Sensations can be caused in two directions. The objects can move against his stick, or his hand can make an action while the objects just resist the stick. In the same way, vision can be described: things are not only directed to our eyes, but the action in our eyes is also directed towards them (1999: 154).

Knowledge does not come from the objects, but depends solely on the parts of the brain where the nerves originate. In fact, our knowledge (which derives from our brains), can be understood as a natural geometry. The soul is able to perceive position<sup>3</sup> and “to know the place occupied by each part of the body it animates relative to all the others”. The soul can also “shift attention from these places to any of those lying on the straight lines<sup>4</sup> which we can imagine to be drawn from the extremity of each part (...)” (1999: 169). The famous picture is accompanied by this text:



Illustration 1: Blind Man (1999: 169)

"(...)when the blind man (...) turns his hand A towards E, or again his hand C towards E, the nerves embedded in that hand cause a certain change in his brain, and through this change his soul can know not only the place A or C but also all the other places located on the straight line AE or CE; in this way his soul can turn its attention to the objects B and D, and determine the places they occupy without in any way knowing or thinking of those which his hands occupy. Similarly, when our eye or head is turned in some direction, our soul is informed of this by the change in the brain which is caused by the nerves embedded in the muscles used for these movements". (1999: 169)

### 2.1.1 Distance

In *Principles of philosophy*, Part Two, art. 18, Descartes defines distance as follows: "(...) every distance is a mode of extension, and therefore cannot exist without an extended substance" (1999: 231). The seeing of distance does not depend on the images emitted from objects (Descartes implicitly refers to the scholastic view), but depends on four things: the shape of the body of the eye adjusted by the brain, the relation of the eyes to one another, "the distinctness or indistinctness of the shape seen, together with the strength or weakness of the light" (1999: 170) and finally, we are able to judge the distance with the knowledge we already have "compared with the size of the images they imprint on the back of the eye – and not simply by the size of these images" (1999: 172). Judging distances is thus a mental act. But this comparison does not rely on any resemblance of the pictures in our eyes; "For these pictures usually contain only ovals and rhombuses when they make us see circles and squares" (1999: 172). Methods for measuring distance are highly unreliable, even for our common sense (the pineal gland), when a distance is greater than one or two hundred feet. This common sense is unable to measure distance of an object far away, because there is "hardly any variation in the angles between the line joining the two eyes (or two positions of the same eye) and the lines from the eyes to the object".<sup>5</sup> Measuring distance with instruments – like telescopes – is also not always reliable.

## 2.2 Telescopes (and lenses and mirrors)

Although Descartes states in *Optics* that sight must be regarded as the noblest and most comprehensive of the senses, in the same section, he claims that we can increase the power of sight by means of the wonderful invention of the telescope. With these telescopes we can attain a knowledge of nature much greater and more perfect than we ever possessed (1999: 152). Telescopes make it possible to bring objects that are distant and inaccessible closer, while microscopes bring objects that are close and already accessible, even more close to our vision. All the things that concerns this perfection, can be reduced to three principles: "the objects, the

internal organs which receive the impulses of these objects, and the external organs<sup>6</sup> which dispose these impulses to be received as they ought" (1965: 114).

## 2.3 Engravings

According to Descartes, it is sufficient for an image to resemble an object in just a few respects. First of all, it is possible that we are deceived by what we sense. Secondly, the position of the nerves can be changed by an unusual cause, "this may make us see objects in places other than where they are..." Furthermore, "if our eyes see objects through lenses and in mirrors" it is possible that our eyes wrongly judge the objects to be smaller or larger than they really are (1999: 172-173). Finally, it is possible that a work of art for instance, is more perfect as an image and represents an object better, because it does not resemble that to which it refers. (1999: 165-166) Descartes uses engravings as an illustration of this fourth argument. An engraving represents things in the real world, but "it is only in respect of shape that there is any real resemblance" (1999: 165). "And even this resemblance is very imperfect, since engravings represent to us bodies of varying relief and depth on a surface that is entirely flat" (1999: 165). He concludes that in order to be more perfect as an image and to represent an object better, an engraving should not resemble the object. This is possible in accordance with the rules of perspective: ovals are represented better than by other circles, rhombuses better than by other squares and so on (see note 4). Descartes also uses this example to make an equation with the images formed in our brain: it is important to know how these images can enable the soul to have sensory perceptions of the corresponding objects, it is not important to know how these images can resemble these objects.

## 2.4 Camera obscura

I explained before that in order to have sensory perceptions, the soul does not need to contemplate any images resembling the things which it perceives. But the things we look at, do imprint quite perfect images of themselves on the back of our eyes. Descartes compares this with a metaphor of the camera obscura (but he does not use the word camera obscura himself in *Optics*):

"Suppose a chamber is all shut up apart from a single hole, and a glass lens is placed in front of this hole with a white sheet stretched at a certain distance behind it so that the light coming from objects outside forms images on the sheet. Now it is said that the room represents the eye; the hole, the pupil; the lens, the crystalline humour, or rather all the parts of the eye which cause some refraction; and the sheet, the internal membrane, which is composed of the optic nerve-endings". (1999: 166)

### **3. Merleau-Ponty's phenomenology: some critical remarks on Descartes' philosophy and an alternative vision**

One of the main 'goals' of phenomenology is to overcome subject and object dualism's. In Merleau-Ponty's work we can find an interesting critique of Descartes' dualistic ontology. Merleau-Ponty often uses the same examples as Descartes (like the blind man and the engravings) in order to criticise Descartes and to give an alternative reading of these examples. In the next section, I will compare the themes I discussed in the work of Descartes with Merleau-Ponty's way of dealing with the same topics which are the body-mind and subject-object dualisms, sense perception, the body, space, distance, depth and extensions. The critique will be twofold. I will give concrete critiques of Merleau-Ponty on Descartes' writings and my own critiques on Descartes' ideas by making use of Merleau-Ponty's phenomenology.

#### **3.1 Body-mind and subject-object oppositions**

Descartes can be said to be an 'ontological dualist'. He uses one method to describe two different substances, *res extensa* and *res cogitans*. His definition of being human is a conscious mind, or a thinking subject. Merleau-Ponty instead understands our existence in terms of a 'psychophysical subject'. A human being is merely one reality and this reality has two modes of being, a physical mode and a mental mode. However, Merleau-Ponty does not speak of a 'unity', because when you use that word, you are already captured in a dualistic vocabulary. Therefore, you can not say that 'you are in your body', because we already 'are our bodies'. A Cartesian way of seeing things would mean that I would see myself as a subjective reflective consciousness and my body as a redundant object that has the same ontological status as the rest of the material world. Merleau-Ponty does not want to draw an exact line between the physical, the mental, the subjective and objective ways of being human. He rather proposes that our physical mode and our mental mode both have a subjective and an objective side. In fact, we are neither merely subject nor object. Sometimes our subjective side prevails, sometimes our objective side is more present. In his work *The Phenomenology of Perception*, Merleau-Ponty emphasises the consciousness of the body itself. He calls the body as a subject a 'lived body', because I am present in the world and also intentionally engaged or directed to the world. When I take place on a chair, my body knows how to do it.

The subject-object dualism also has to do with what I called in my introduction a 'human-world' opposition. For Descartes, the body and the mind are not only appreciated as two different substances, the mind is also rated as more important, as primary if it comes to sense perception and gaining knowledge of the world.



Merleau-Ponty does not only criticise Descartes' weight on the perceiving mind (because of the disembodied state it gets into), but also criticises the fact that in Descartes' analysis of sense perception, the perceiving mind is cut off from the perceived world or objects.<sup>7</sup> In phenomenology, the subject and object constitute each other, just like the body and the mind are two sides of the same thing.

### 3.2 (Sense)Perception

For Descartes, perceiving is a mental act of the mind. Although Descartes can not deny that 'perceiving' starts with embodied sensory awareness (compare note 5), in the end he always tries to get rid of the body by stressing the importance of our deciphering and judging mind. Only the mind is able to decide what true knowledge is. Merleau-Ponty says among other things in answer to this: "There is no vision without thought. But *it is not enough* to think in order to see" (1964: 175). His critique is that we can't do without our body in sense perception: all consciousness is perceptual and consciousness can be addressed to both our mental and physical modes of being. For Merleau-Ponty, perception can never be a 'disembodied spectator with an objectifying gaze'. Instead, perception is always embodied as a sensory awareness of my body and the world. Perception is an experience and not a mental act of the mind. "To perceive is to render oneself present to something through the body" (1964: 42). Sensory perception is prior to every knowledge. Even knowledge which seems not derived from experience, has a background in the perceived world. Before we can understand a geometrical 'circle' for example, we have experienced what 'round' means for us.

Merleau-Ponty also rejects Descartes' materialistic approach which implies a model where sensory perception reaches the mind through the nerves and the brain. Merleau-Ponty says that by enhancing a materialistic approach, Descartes does not investigate what seeing is, but is focused solely on the question how it is achieved. *Optics* "is the breviary of a thought that wants no longer to abide in the visible and so decides to construct the visible according to a model-in-thought" (1964: 169).

Another aspect of our embodied perception is rendered by the fact that perception is a sensory-motor behaviour according to Merleau-Ponty. In order to see something, I move my body all the time. In fact, seeing and moving your body presuppose each other.

"My mobile body makes a difference in the visible world, being a part of it; that is why I can steer it through the visible. Conversely, it is just as true that vision is attached to movement". (1964: 162)<sup>8</sup>

According to Merleau-Ponty, Descartes hardly speaks about moving your body in order to see something - except when Descartes speaks of the hand of the blind man that moves the stick.<sup>9</sup> A lot of examples that Descartes uses in *Optics*, like the

telescope and the camera obscura for instance, implicitly presuppose a view on perception as an 'isolated' act. Merleau-Ponty stresses that perception is possible because of a 'field'. This means that we always perceive a figure against a background. We can change our perspective all the time, but not like a camera that zooms in or out. Seeing is limited, because I can only see the things that are in my field, but not limited in the sense that my field of perception has clear boundaries; I do not see a 'frame'. We can *think* of objects and spaces as 'isolated' (by objectifying them mentally), but in fact perception is never isolated, because of the perceptual field. The hidden side of objects are present to us also. Not because we can think them, or because they are possible perceptions, but because the hidden is in my vicinity. I can touch things, I just have to extend my hand. In other words, "the unseen side is given to me as 'visible from another standpoint'" (1964: 15). I can never see the whole object, because of my point of view on the world.<sup>10</sup> But I can move my body in order to gain another side.

A last comparison I will make between Descartes and Merleau-Ponty with respect to sense perception, has to do with my earlier comments on Descartes' analysis of sense perception as a disembodied mental act. One could argue, that because Descartes neglects the importance of the body, Descartes is not only able to draw a line between the person who perceives and what is perceived, but also treats the senses as separated, just like the body is conceived in terms of body parts. Merleau-Ponty will not deny that a methodological distinction between body parts and the five senses is possible, but ontologically spoken, they have to be considered as a whole.

### 3.3 The body

I already discussed the problematic consequences of a disembodied spectator. Although Descartes tries to get rid of the body, he still acknowledges a first person perspective, even though the experiences of this first person are reduced to a Cogito, a thinking I/eye.<sup>11</sup>

According to Descartes, the mind is grasping the objects in itself. Phenomenology would stress that an object appears first of all as an object for me; in fact the things I perceive sometimes appear to me as ambiguous. In Descartes' writings, one could recognise the mind as a very 'hard worker'. It has to polish every ambiguous feature into 'true knowledge'. Interesting in the work of Merleau-Ponty is that my body has to be understood in terms of my point of view (POV) on the world. My body is itself the central perspective; it defines which sides of the objects I perceive (1964: 5, 16). Merleau-Ponty calls this the 'phenomenal body'. This means that I experience from an embodied first person perspective. The crucial difference here between Descartes and Merleau-Ponty is that Descartes considers perspective as something that is attached to the things themselves and has geometrical qualities, like the

Renaissance paintings, whereas Merleau-Ponty understands that my body is itself the central perspective on the world. Furthermore, perception is always arising in the here and now perspective of the body (Bannan 1967: 61).

Finally, I would like to elaborate on the consciousness of the body itself, which I spoke of before. This embodied intentionality can be understood in terms of the Body Schema (BS). By means of this BS, the body has a tacit knowledge or tacit Cogito (1997: 18, 183) – not to be confused with Descartes' mental Cogito. I already mentioned taking a seat without thinking about it. The BS may not be reduced to brain calculations, nor to mechanical, automatical or reflexive bodily actions. Bodily actions are never said to be like that, because the body has to adjust its positions et cetera in every situation by means of the BS, even though some situations are more familiar to us than others – for example for me, riding a bike is easier than driving a car, because I never drove a car before.

### 3.4 Space

According to Merleau-Ponty, we can not understand space as the sum of three dimensions (1964: 174). Descartes' concept of space as three dimensions which are materially extended, are just categories of the mind. Instead of a geometrical account of space, Merleau-Ponty takes the body into account. He makes a distinction between a primary lived space and a secondary space (Kwant 1968: 38). The secondary space can only be understood because the primary space is experienced prior to it. The primary space or the natural lived space is an 'oriented space'. Space exists because I have a body. My body is the a priori condition for my experience of space, because the structure of my body is spatial itself. The spatiality of the body itself is already explained by the intentionality of the body in terms of the Body Schema. Not only do I inhabit space, I live it from within. Space is presupposed, it does not exist and does not appear as an objective entity separated from myself. Space is always 'space for me'. I have to adjust to real dimensions. When I experience the table as near, or a door as far away, it means that they are 'near and far' for me! When our body changes, for example by growth or a disease, the oriented space changes with us. In general, dimensions like near and far are not fixed features of the objects themselves; my experience of objects changes when I move towards them or away from them. Furthermore, Merleau-Ponty speaks of a secondary space. He also calls this an abstract or objective space. This kind of space can be understood as a construction of the mind. We are able to have a mental picture of a space where everything is placed. In other words, we objectify our oriented lived space into a mental map. The fact that we are able to imagine ourselves in fictive spaces for instance, "borrows from vision and employs means we owe to it". (1964: 187)

"Space is no longer what it was in the *Dioptrique*, a network of relations between objects such as would be seen by a witness to my vision or by a geometer looking over it and reconstructing it from outside. It is, rather, a space reckoned starting from me as the zero point or degree zero of spatiality. I do not see it according to its exterior envelope; I live it from the inside; I am immersed in it. After all, the world is all around me, not in front of me". (1964: 178)

The problem in Descartes' concept of *res extensa* is the fact that bodies and things are reduced to the same order: they are just materially extended in space. Merleau-Ponty says that there is a crucial difference between objects and bodies. Things are in space, they are just 'placed' in the objective space. We as lived bodies on the other hand, 'inhabit' the oriented space, we live it from within. Secondly, there is a difference between moving a thing and moving your body. Objects are placed and can be moved from a to b. My body is not in objective space, so I do not move it from a to b. I never have to find myself before I want to move. I have direct access to space because I am my body (1964: 5). For this reason too, my body can never be something that is 'in front of me'. But if we consider Descartes' ontology very strictly, one might conclude that the body is an 'in front of me' indeed, because identity ends at the non extended Cogito – even though this seems a phenomenal and empirical impossibility.<sup>12</sup>

Another difference between Descartes' and Merleau-Ponty's concept of the body and things is that the former assumes that they are positioned in space, while the latter claims that the body can never be positioned, because it does not refer to a determinate position or external co-ordinates. The body is rather situational, this refers to the lived space again (Bannan 1967: 70, Merleau-Ponty 1997: 144, 189). By means of my sensory-motor capacities I can perceive and also act, for example grasp or point out. Besides my 'actual body', I thus also have an 'habitual body' that is ready for all kinds of bodily movements all the time (Bannan 1967: 70). In the same way my body is the condition for space, "my body is that by which there are objects" (Bannan 1967: 64).

### 3.5 Distance and depth

Like the other dimensions, Descartes considers distance and depth as a something that can be calculated and deciphered by the intelligible mind. Merleau-Ponty argues that things are not perceived by a mind that adds a geometrical perspective to measure distances and so on. We can not understand depth in terms of a third dimension, because this does not say anything about the *experience* of depth (1964: 180, 1997: 307). Merleau-Ponty goes on by saying that for Descartes, it seems as if things are placed behind each other, for example when Descartes describes the engravings. While for Merleau-Ponty, unseen things or sides are in reach of the body.

Distances and directions are understood intentionally by the body. It depends on my POV.

“We are always on this side of space or beyond it entirely. It is never the case that things really *are* one behind the other. The fact that things overlap or are hidden does not enter into their definition, and expresses only my incomprehensible solidarity with one of them – my body”. (1964: 173)

When you compare a man at 200 hundred paces or 5 paces, he is not seen ‘smaller’, he is simply the same man at a greater distance. We perceive things just as ‘here’ or ‘there’ (1964: 180). Like perspective; distance, depth and space are not measurable objects and are not features of the things themselves: “they are the best hold our body can take upon the world” (Bannan 1967: 95, Merleau-Ponty 1997: 314). They belong to the POV of my body.

### 3.6 Extensions: the blind man

A last comparison has to be made between Descartes’ and Merleau-Ponty’s notions of extensions. The example of the blind man discussed in the Descartes section, is taken up by Merleau-Ponty in his work *The Phenomenology of Perception*. First of all, I would like to recall that Descartes describes extensions mainly as bodies or objects who are materially extended in space. In the example of the blind man, the stick leads Descartes to the phrase “a blind man sees with his hands”. In answer to this, Merleau-Ponty notices that “The Cartesian concept of vision is modeled after the sense of touch” (1964: 170). Merleau-Ponty has written a lot of things with respect to what ‘seeing’ means, but for now I would only like to mention the following definition that Merleau-Ponty wrote in *Eye and mind*: “To see is *to have at a distance*” (1964: 166).

Let’s return to the extensions. According to Merleau-Ponty, extensions can be understood as an expansion of my Body Schema. This means that objects, instruments, prostheses and the like are incorporated in my BS. When you drive a car or wear a head, your body knows if you can pass an alley or a door. You do not measure the breadth and do not compare that with the distance it takes from there to your extension. The same goes for the blind man. His stick is no longer experienced as an object. It is an instrument through which he perceives. The world does not start at his sensing hand (as it does in Descartes’ writings), but at the end of his stick. His eyes are at the end of his stick. “When a blind person explores the world, he knows the length of his stick through the objects, instead of the position of the objects by means of his stick” (1997: 189). According to Merleau-Ponty, in Descartes analysis of the blind man “the body is not the means of vision and touch but their depository” (1964: 178). At this point, I conclude that for Merleau-Ponty extensions do not mediate our perception. Even if we need a stick to see, the objects are still immediately present in my experience of them (1997: 189).<sup>13</sup>

## 4. Shattered embodiment

### 4.1 Virtual spaces and possible body positions

Before I will explain what I mean by shattered embodiment, I will first distinguish three types of virtual spaces. Each of these types relates to one or more possible body positions.<sup>14</sup>

<i>Virtual space types</i>	<i>Possible body positions</i>
1. Screen space: on-the-screen space	- The here-body: my own first person perspective
2. Screen space: through-the-screen space	- The here-body: my own first person perspective - Avatar: first person perspective - Avatar: third person perspective
3. CAVE space: through-the-screen space and surrounding space	- The interface body: the here-body (my own first person perspective) and my virtual body mix up

Illustration 2

With on-the-screen space I mean your 'here-body' (the lived body or phenomenal body) is behind a (computer) screen, lacking any experience of 'depth' or 'distance', for example E-mail, word-processing, hypertext, et cetera. One might call this 'the surface level'. The first person perspective means the POV of my real body: I see the surface of the screen through my own eyes.

In a through-the-screen space, you are still behind a (computer)screen, but you are experiencing a virtual spatiality that goes 'beyond' the surface.<sup>15</sup> With this type of space, there are two combinations possible. The here-body combined with the first person perspective, or the here-body combined with an avatar for which there are two perspectives possible: a first person and a third person perspective. In each combination, the here-body is always present, because I can not do without my own POV or first person perspective. The first person perspective, is just my here-body surfing the net or playing a video or online game, without an avatar. For example: when I enter the site of the Dutch writer Harry Mulisch ([www.harrymulisch.nl](http://www.harrymulisch.nl)) I can navigate through a virtual house by clicking on the mouse and encounter things referring to his books or personality. Secondly, my body can be doubled by an avatar, whereby I am looking through the eyes of the avatar: my own first person perspective coincides with my avatar. A third possibility, is the doubling of my body

too with the use of an avatar, whereby I see my avatar from a third person point of view, made possible by my own body's first person perspective.

The third kind of virtual space I would like to describe is more advanced than average computer screen spaces. I am aiming at the CAVE™, a 3D environment where VR computer images are projected on three panels and on the floor.<sup>16</sup> Important to mention also is that the projections are also visible in the space that surrounds the user. When I was in a CAVE once, I made a walk in a 3D 'drawing' and did not only see flying butterflies projected on the panels, but also through the space around me. The CAVE space thus is a combination of a 'surrounding space' and a special kind of 'through-the-screen space'. This special kind of screen space is in fact very distinct from the average computer screen spaces I described before. There are three screens – the panels. These screens have a very impressing effect because they measure three by three meters each. Because of this size, the projections can be done on a 1:1 scale, so when I am walking in a virtual building, the dimensions are experienced very 'real' by me. In the CAVE, every point of view can be taken. All this causes the body of the user to be fully intentionally engaged in the CAVE. I will propose that in the CAVE, the body becomes the interface itself in fact. On the one hand, the bodily movements affect the headtracker and therefore change the POV of the user, and on the other hand the change of perspective influences your bodily movements again. Furthermore, the use of gloves for instance, enable an experience of resistance for the user. I called the interface body of the CAVE a mixing up of the here-body and my virtual body. In the next section, I will explain what I mean by this.

## 4.2 Cartesianism revisited in Cyberspace

In this section I would like to clarify why I call cyberspace technologies a 'Cartesian project' and what I mean with 'shattered embodiment'. Section 2 and 3 will be helpful to shed some light on these topics. Let's start with some Cartesian aspects of Virtual Reality in general.

In virtual domains, sense perception is highly visual. The visual perception is doubled: we see through our embodied eyes and through a virtual camera perspective (which includes an avatar sometimes). Virtual Reality uses camera positions (like the birds eye view) a human can never take without the help of technological artefacts. The cameras also zooms in and out, which is neither a possibility of the human eye. We might even compare ourselves to the blind man: in order to see something, we have to touch our keyboard and mouse. If we touch something in a virtual world 'on' or 'through' the screen, we do not really feel it, but use our minds to place actions in a symbolic order. Our perceptual field is literally framed by the boundaries of the computer screen in Virtual Reality. What we see 'on' or 'through' the screen gets very isolated. The phenomenological aspect of the

perceptual field, namely the figure-background structure, gets very reduced in this framed way of seeing. Furthermore, Merleau-Ponty stated that seeing (and perception in general) can not do without the moving body. In cyberspace however, a great part of the body sits still, except for our hands and rolling eyeballs. When I want to find out more of a hidden (side of an) object, I can send my avatar to go there of course, if I have one. He or she can turn around the object to inspect it a little more closely. But still, the whole camera position has to turn to the other side, in order to give me a glimpse of the side or backside. Objects or sides are never in my vicinity, even though we perceive them in 3D.

In order to continue our bodily intentionality in Virtual Reality, we need a virtual body double, an avatar. If there are bodies in cyberspace, one might argue, why is cyberspace still Cartesian at all? The embodiment issue is a hard one: although I can perceive and act through the first person perspective of my avatar, the body of the avatar can not be felt by me. We can perceive this phenomena in two ways. Either we have to say that the gaze of the avatar is disembodied, or we have to say that the avatar's perception is only perceived through means of my own body, which denies the embodied existence of the avatar itself. The avatar's body remains an image; a representation of an embodied being. When I see my avatar and the virtual world in the third person perspective, the avatar's body is stretched out in front of me literally – very Cartesian indeed. Moreover, there is no difference between the virtual bodies and objects in cyberspace; they are all placed in front of me. One might argue that avatars are not placed like objects, that they can be situational bodies too, because we make them act. On the one hand this is true, but on the other hand avatars are still objects if we consider the fact that in some virtual worlds, the avatar gets lost in your perspective if it dies; then you have to find it again. Phenomenologically spoken, I never have to find my body in order to move or perceive; as I said before 'I am my body'.

In general, Space is objectified in Virtual Reality in 'through-the-screen-spaces'. In one way, virtual space is not Cartesian at all, because it is not materially extended – compare my descriptions of the surrounding space in the CAVE however.

The CAVE space seems the least Cartesian virtual space compared to screen spaces. There are two main reasons for this. The body as interface plays a central role and the projected surrounding space gives a more realistic representation of the real space. It seems as if for these reasons, the CAVE comes more close to the phenomenal body and phenomenal space. Paradoxically though, the experiences one has in the CAVE show the opposite. While you are more bodily engaged in the CAVE than in screen spaces, Cartesian ruptures are also more strongly experienced. One of my 'journeys' in the CAVE was a virtual visit to a square in a Belgian city. The camera position was going everywhere: to the left, to the right, up, down, flying, landing, turning, slow, fast, et cetera. Because there are so many similarities compared to perception in real life (the 1:1 scale, the surrounding space, the



surrounding panels, etc.) your body takes everything that happens for real (even if you know that you are not at all in Belgium). What happens is that your personal POV is trying to attune to the POV of the camera, which fails. For this reason, you experience a shattered embodiment: on the one hand my body tells me I am standing with two feet on the ground, on the other hand my sense perception tells me I am flying! My sense perceptions get incompatible and this contradictory way of experiencing leads to feelings of nausea and instability. This is what I meant by 'shattered embodiment.'

Philosophically speaking, my 'here-body' and 'virtual body' are getting mixed up.<sup>17</sup> Another way of analysing these phenomena is in terms of two kinds of spaces that are getting mixed up. Merleau-Ponty distinguished two kinds of spaces: the oriented space (as a lived space) and the objective space (as an objectified space). What happens in the CAVE is that the objective space seems more phenomenological reproduced than in screen space. The reasons for this are again the surrounding panels and the projected surrounding space. The experience of oriented space on the other hand (the spatiality of my body itself) is suffering from Cartesian ruptures. When I am intentionally engaged in the CAVE, the motory and sensory aspects of my bodily intentionality do not coincide with each other. This is where the Cartesian breaks come into play. Moreover, the oriented space and the objective space get blurred, because the objectified space becomes divided in my experience. Visually, the three by three meter platform I am standing on in front of the panels gives me the false illusion that the space I am occupying with my feet is merging smoothly into the through-the-screen space of the panels. But when I am taken in a virtual journey to a square in Belgium, I experience a break between the space of the platform I am standing on with my feet and the virtual space that is projected on the panels.

## 5. Conclusion

One of my aims in this paper, was to illustrate my hypothesis of an objectified Cartesian worldview, expressed in Virtual Reality technologies. In order to do so, I had to take two steps beforehand. First of all, I explained the main ideas of Descartes' *Optics* with respect to his vision on sense perception, space and the body. Secondly, I compared the described topics of the dualistic philosophy of Descartes with the phenomenological critique and alternative of Merleau-Ponty. These elaborations served as a background in order to illustrate some Cartesian features of cyberspace. With respect to the three described spaces, the CAVE seemed to arouse the strongest kind of Cartesian ruptures, which I referred to as experiences of 'shattered embodiment'. By using this terminology, I wanted to avoid

a discourse in terms of 'embodiment versus disembodiment'. Considering this, the following question remains. In what way is the experience of a Cartesian 'shattered embodiment' possible, if we take into account the fact that Descartes' philosophy is about *thinking* ourselves and the world and not about an *embodied existence*? Of course, Descartes made the wrong analysis. He unjustly reduced the experience of sense perception, space and the body to perceptions of a disembodied mind. Although the terminology of the 'lived body' was coined in the 19th century for the first time, Descartes certainly had a 'lived body' himself, even in the 17th century. To answer the question then, the work of Don Ihde may be helpful again. In his latest work, *Bodies in technology*, Ihde makes a distinction between our 'here-body' (RL body) and our 'virtual body' (VR body) (2002 b: 3-15). Ihde describes the virtual body in terms of a disembodied third person perspective. The reason then why I can have a virtual or ruptured experience, is because the 'here-body' is always prior to any experience:

"It is the here-body in action that provides the centered norm of myself-as-body. This is the RL body in contrast to the more inactive or marginal VR bodies that make the shift to quasi-disembodied perspectives possible". (2002 b: 6)

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## Notes

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1. Descartes uses 'mind' and 'soul' to refer to the same thing: our intellect or capacity to think.
2. In fact, this is a very important notice. It means that according to Descartes, the mind perceives without the guidance of a conscious reflection. Of course this is true because of the adjustments the brain makes according to Descartes (and the brain is generally understood as a material organ with material processes which we can not affect most of the times). But it means for a great deal that Descartes comes close to Merleau-Ponty when he states in the same section that "when we clasp some body with our hand, we adjust our hand to its size and shape and thus feel it by means of our hand without needing to think of these movements" (1999: 170). Although Merleau-Ponty is known for his rejection of the materialistic approach of Descartes' philosophy, in the quoted section they seem to share a believe in the intentionality of the body itself – even if Descartes remains a materialist and a reductionist in most of his writings.
3. Position is defined by Descartes as: "the orientation of each part of an object relative to our body" (1999: 169).
4. Descartes is very ambiguous with respect to perspectivism. In the quoted sentence, Descartes shows a faith in perspectivism in order to stress the equation with the natural geometry of the mind. In other sections he is more critical. For example with regard to the judgement of distance by size, shape, colour et cetera, he claims that "pictures drawn in perspective show how easy it is to make mistakes. For often the things depicted in such pictures appear to us to

be farther off than they are because they are smaller. While their outlines are more blurred, and their colours darker or fainter, than we imagine they ought to be" (1999: 175).

5. See again note 4. Notice furthermore, that in this section Descartes implicitly stresses that the pineal gland or common sense can not judge correctly, if the external senses fail completely.
6. In *Principles of Philosophy*, Part Four, Descartes states that "there are only seven principal groups of nerves, of which two have to do with internal sensations and five with external sensations". The internal sensations are linked with the internal organs and parts like the stomach and the throat who deal with "the natural appetite" (sensations like hunger and thirst). "The nerves which go to the heart and the surrounding area (...) produce another kind of internal sensation which comprises all the disturbances or passions and emotions of the mind such as joy, sorrow, love, hate and so on" (1999: 280). The external faculties of sense-perception are referring to the five senses, like vision and hearing. The internal and external sensations and faculties both refer to Descartes' use of the verb 'to sense' and 'sensory awareness'. This is opposed to Descartes' notion of 'perception', which must be understood as the purely mental apprehension of the intellect (see Cottingham 1994).
7. Whereby we have to notice that the 'perceived world' can be my own body as well! In *The Visible and Invisible*, Merleau-Ponty gives the example of my one hand touching the other hand while the touched hand is touching another object.
8. You can apply this to all kinds of sense perception: we adjust our bodies all the time in order to see, hear, touch, smell and taste.
9. In subchapter 2.1 however, Descartes said that things are not only directed to our eyes, but the action in our eyes is also directed towards them. But still, I would like to defend Merleau-Ponty's analysis, because in Descartes line of thought this example was used as an argument to stress the importance of the geometrical qualities of the mind in dealing with the right angles, distances and so forth.
10. See 3.3 about the body.
11. Because the body and the perceived world are objectified by the mind (as extensions of the mind) in the work of Descartes, one could also defend a definition of the Cartesian subject in terms of a third person perspective.
12. Space and bodies perceived like an 'in front of me' also derive from a reduction of sense perception to a disembodied spectator who perceives isolated sense

data. Of course, Descartes' view has been influenced by the invention of instruments in his age, like the telescope and the camera obscura for instance, in which the act of perceiving is constructed by the technology and the perceived objects get framed.

13. If we consider Merleau-Ponty's account of extensions, I am not sure if we can defend the fact that perception is never mediated if we regard advanced Virtual Reality technologies like Telepresence for example. The extensions in these kind of examples are not always (completely) in contact with my body. One might argue however, that even these kind of extensions are incorporated in the BS, by means of the interface (typing your keyboard, clicking your mouse). But what happens if the interface becomes the body itself? (See chapter 4). For now, these questions *extend* the scope of this paper.
14. I adopted the following terminologies from Don Ihde: 'the here-body', 'on-the-screen space' and 'through-the-screen space'. My use of these definitions differs on some points from Ihde with respect to their meaning and grouping. The other descriptions are made by me in so far as they are not general like 'avatar' and 'virtual body'. (Compare Ihde: 2002 a).
15. According to René van de Vall, Richard Wollheim makes a difference between being aware of the surface and being aware of what is represented on the surface, with respect to artworks. I would like to apply this difference to the two screen spaces mentioned: in the first screen space you are 'a spectator of the picture' and in the second type of space, you are 'a spectator in the picture'. With respect to virtual reality however, we can not simply speak of 'representations' of course, because the virtual can present worlds that do not match with reality. Furthermore, Van de Vall argues that Wollheim's 'two foldness' emanates from a difference made too explicitly between the real world and the virtual world. An 'in between' position might also be possible according to Van de Vall. Source: written but unpublished comments of Van de Vall on Vivian Sobchack's *The Address of the Eye. A Phenomenology of Film Experience*, presented at the Workshop "Multimedia and the interactive Spectator. An international Workshop" held at the University of Maastricht (Maastricht, the Netherlands), May 2002.
16. The user stands on the floor in between the three panels and uses special kind of glasses equipped with a 'headtracker' (a device that measures movements of the user's head in order to locate him with respect to the projections) and a 'wand' (a kind of 3D-joystick in order to navigate through the virtual space). It is also possible to enlarge your outfit with 'gloves' for example. CAVES are among other things known for their applications in engineering, architecture, medical visualisation and biotechnology. One of the most important reasons for these

industries to make use of the CAVE, is to experience a design or application before it will be placed in the market.

17. Merleau-Ponty describes some interesting experiments (Merleau-Ponty 1997: 301, Kwant 1968: 70-74). In one of them, a test subject is placed in a mirrored room. Immediately, he loses grip on the objects placed in this room. After a while, his 'virtual body' (the habitual body) comes into play and represses his 'actual body' (the here-body). This means the test subject is now able to live in the mirrored room - i.e. it is as if he lives inside a spectacle, because he experiences the legs he *should* have to be intentionally engaged in this room. Normally, my actual body and virtual body coincide (see conclusion).