Gilles Deleuze's 'the Brain is the Screen' in Digital Culture

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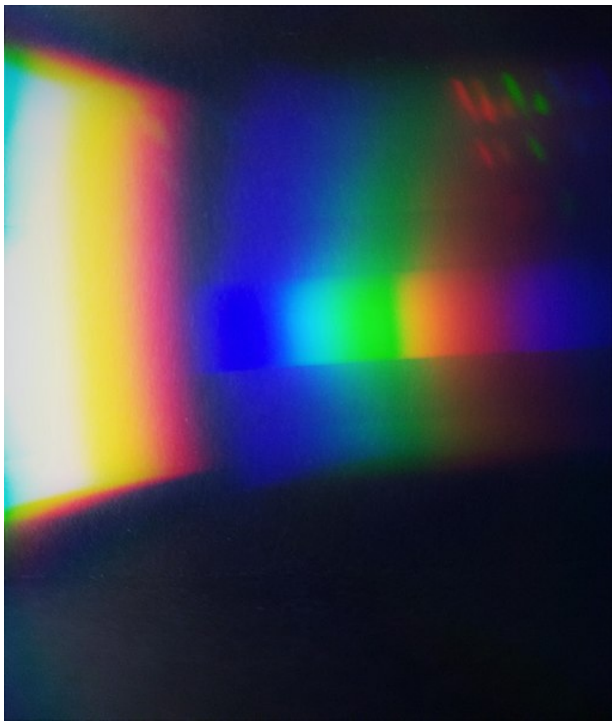

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Introduction

In *What Should We Do with Our Brain?* Catherine Malabou discusses different models that are used to understand the brain and evaluates them in terms of plasticity, the ability to mold.[1] Rejecting the metaphors that depict the brain as if it is a machine, central telephone exchange or computer, she finds that Deleuze offers a take on the brain which allows for and is even determined by the plasticity it actually possesses. For him, the brain is an acentered system characterized by its cuts and gaps.[2] Furthermore, according to Malabou the plasticity of the brain is also the "real image of the world".[3] This means that although we might not see it, we experience (brain)plasticity here and now. The world itself is thus actually plastic, it can be shaped and created in ways we have not yet imagined, but as we are not aware of it we miss out on great potential for change. Malabou gives examples of Deleuze's cinematic understanding of the brain, but also of films by Alain Resnais and Stanley Kubrick, which help to demonstrate the plasticity of the world and its relation to our brain.[4]

This was the first academic connection I encountered between film (art), (neuro)science and philosophy and it was gripping enough for me to delve further into this complex interdisciplinary matter. Presently, I will focus on Deleuze's famous statement "le cerveau, c'est l'écran"[5] (the brain is the screen). This intriguing sentence was published in an interview with Deleuze in *Cahiers du Cinéma* in February 1986 when discussing his book *Cinema 2: The Time-Image*.

> The brain is unity. The brain is the screen. I don't believe that linguistics and psychoanalysis offer a great deal to the cinema. On the contrary, the biology of the brain—molecular biology—does. Thought is molecular. Molecular speeds make up the slow beings that we are. . . . The circuits and linkages of the brain don't pre-exist the stimuli, corpuscles and particles that trace them. . . . Cinema, precisely because it puts the image in motion, or rather endows the image with self-motion, never stops tracing the circuits of the brain.[6]

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[1] Catherine Malabou, *What Should We Do with Our Brain?*, 1st ed, Perspectives in Continental Philosophy (New York: Fordham University Press, 2008), 6.
[2] Malabou, 36.
[3] Malabou, 39.
[4] Malabou, 38–40.
[5] Gilles Deleuze, 'The Brain Is the Screen: Interview with Gilles Deleuze on "The Time-Image"', trans. Melissa McMuhan, *Discourse* 20, no. 3, (1998), http://www.jstor.org/stable/41389498.
[6] Deleuze; As quoted in Patricia Pisters, *The Neuro-Image: A Deleuzian Film-Philosophy of Digital Screen Culture*, Cultural Memory in the Present (Stanford, California: Stanford University Press, 2012), 3.

This passage relies greatly on Deleuze's philosophical work on film, brain and world, and particularly on his two *Cinema* books. For him cinema, science and philosophy are intrinsically connected. This framework of the brain in film and film in the brain could allow for the much-needed plasticity that Malabou discusses and which other brain metaphors lack. However, it does need some elaboration and since over 30 years have passed since Deleuze gave this interview, it is also relevant to re-contextualize it within today's society and its technological environment.

Pisters has done this recently in her book *The Neuro-Image*, which offers an enlightening take on the connection between the philosophy, film and science.[7] Not only does she discuss Deleuze's ideas on cinema (the movement-image and the time-image) and their relation to the brain, but she also brings forward a third type of image, namely the neuro-image that characterizes contemporary cinema. She sees this as a third dimension of the images, just like the time-image was also a dimension of the movement-image. Furthermore, Pisters conceptualizes the three dimensions according to the three syntheses of time, as past, present and future respectively and insists that one does not exclude the others.[8] Although many characteristics of the neuro-image seem to also correspond with Deleuze's definition of the time-image, the question is not necessarily if this image-type is justified, but rather how the newly emerged neuro-image impacts the connection between brain and screen as Deleuze originally formulated it. Therefore, the question I aim to answer in this thesis is the following:

What is the relationship between brain and cinema in digital (screen) culture?

It is important to note that this thesis does not deal with the direct effects of digital culture on the brain. Instead the focus is on the potential future of cinema in digital screen culture, as I will argue that this has an impact on its 'soul', and the deep connection of cinema in general to the brain. In order to answer this, I use the theories of Deleuze, Malabou and Pisters as guiding concepts throughout.

In the first part, I elaborate on the specific choice of film. In what way, according to Deleuze, is it different from other media or artforms? What are movement- and time-images? In the second part I proceed to dissect 'the brain is the screen'. How should we

[7] Pisters, *The Neuro-Image*.
[8] Pisters, 137–38.

understand the brain? What exactly does this equivalence mean? Finally, in part 3 I discuss how the Deleuzian notion of the screen applies now that we live in a world dominated by technology with screens? I explain and discuss the concepts of nomadism and diffraction and their application to contemporary cinema in the hope of shedding more light on the status of the relationship between brain and screen in digital screen culture.

1. Cinema

In his books *Cinema 1: The Movement-Image* and *Cinema 2: The Time-Image*, Deleuze analyzes pre- and post-World War II cinema respectively.[9] Drawing Henri Bergson's theories on perception, Deleuze discusses technical aspects that mark different periods in the history of cinema and thereby obtains a classification. Deleuze insists that the books are not meant as a history of cinema, but as a taxonomy. They should be regarded as an explication of atemporal characteristics of cinema (some are more pronounced at certain times) and certainly not as historical categories. However, Paola Marrati, who has written a clarifying work on Deleuze's theories on cinema, remarks that the historical event of World War II does mark the switch from the movement-image to the time-image.[10] She explains this seeming contradiction by interpreting the post-war era as a time where our conception of history differs crucially from before. This refers to the notion that both image-types must be seen more as co-existing regimes, where one is more dominant than the other, rather than as separate successive periods in time. The time-image thus existed already before World War II, but the movement-image was dominant in film at that time. After the war, something changed and consequently the dominant tendency in cinema did as well.

In *Cinema and Philosophy*, Marrati stresses that Deleuze's aim with the cinema books is to grasp the "singular essence of cinema",[11] the quality which distinguishes it from other arts or sciences. It is important to note that Deleuze analyzes technical aspects of film to define a category and not the narrative. For Deleuze, narrative is not a main characteristic of images, because it only ensues from the composition of either movement- or time-image,[12] in which montage, frame and shot play a crucial part. According to Deleuze, images need to be read. However, this does not mean they are equivalent to language. For him, using linguistics is not the proper way to read them and he insists cinematographic images need their own concepts.[13] In order to be able to grasp the relationship between brain and cinema, it is important to explain this essence

[9] Gilles Deleuze, *Cinema I: The Movement-Image*, trans. Hugh Tomlinson and Barbara Habberjam, Paperback edition, Cinema 1 (London ; New York: Bloomsbury Academic, 2013); Gilles Deleuze, *Cinema II: The Time-Image*, trans. Hugh Tomlinson and Robert Galeta, Paperback edition, Cinema 2 (London ; New York: Bloomsbury Academic, 2013).
[10] Paola Marrati, *Gilles Deleuze: Cinema and Philosophy* (Baltimore: Johns Hopkins University Press, 2012), 65.
[11] Marrati, 5.
[12] Marrati, 48.
[13] Marrati, 21.

of cinema and its concepts here. The possibility of such a relationship (in which Deleuze himself obviously believed when saying that 'the brain is the screen') gives away that cinema must have something special that demarcates it from other images, artforms, media, science or industries.

Movement

When it first was introduced, cinema was considered to be "neither art nor science".[14] Eventually categorized as closer to art, albeit a popularized and accessible form of it, cinema was more ambiguous in its beginnings due to its innovative industrial character and use for technical studies of movement.[15] These characteristics can still apply, as cinema retains a tight bond with technology and commercial as well as independent works have the means to respond artistically to the society they are created by.[16] As an artform, cinema is modern and accessible, differing the from the classical arts due to its reproducibility, therefore remaining an "industrial art".[17] In his famous essay *The Work of Art in the Age of Mechanical Reproduction*, Walter Benjamin discusses how film and photography distinguish themselves by their mechanical reproduction.[18] For him, film is an art, however, its function has changed in contrast to previous artforms. Instead of being defined by a cult value, rooted in rituals and religion, the exhibition value has taken over and this is increased by its easy reproduction. To see a film, one does not have to go to a specific place like a museum anymore, where there is a unique original work of art on display. Instead, films can be seen in cinemas all over the world (this is what Benjamin refers to), but nowadays film is also reproduced digitally with DVD's or on the Internet. The fact that film is so well adapted to gaining the most views means that it has a high exhibition value.

For Deleuze, what differentiates cinema from other (mechanically reproducible) art forms is its movement in images. This is not just any type of movement, but movement between frames, an essential part for creating continuity.[19] Other visual art forms always create something static. Even if it is an image of movement (like a picture

[14] Deleuze, *Cinema I*, 7; Marrati, *Gilles Deleuze*, 9.
[15] Deleuze, *Cinema I*, 6.
[16] Pisters, *The Neuro-Image*, 7.
[17] Deleuze, *Cinema I*, 7.
[18] Walter Benjamin, 'The Work of Art in the Age of Mechanical Reproduction', in *The Continental Aesthetics Reader*, ed. Clive Cazeaux (London ; New York: Routledge, 2000), 323.
[19] Marrati, *Gilles Deleuze*, 8.

of a person running), it is not a movement-image, because the image remains still.[20] Theatre would seem like an exception. However, it cannot vary in frame, shot or montage, meaning that although the images are in movement, the artform remains attached to one perspective and movement does not emerge in the same 'independent' way.[21] In our natural perception, we are also confined to our perspective and therefore what makes cinema so special is that it releases movement from being attached to our own body, and creating multiple perspectives at once. In this sense, "cinema's particularity is to produce images that are irreducible to the model of subjective perception".[22] Due to this independence of cinematic images in relation to the subject, we can expect them to be more than mere representations. Instead, through its movement and its plasticity, cinema participates in a "becoming different" [23] of the world into image.

The previously mentioned conception of history as a narrative relying on human agency is one of the defining features of many movement-images, in the form of the action image. In Deleuze's first *Cinema* book, frame, shot and montage of classic cinema are broken down and concepts such as action-image, affection-image and perception-image explained. While affection-images show internal feelings, action-images have the character(s) change a situation. Perception images show how a character perceives and is perceived.[24] According to Deleuze, montage is the combination of these three types of images.[25] The cinematographic aspects of images define the type of image they create. For example, Marrati discusses American organic montage, widely used in early Hollywood, where the montage forms the images into an assemblage, like an organic whole.[26] This is an active type of montage, meaning that the montage leads the film to be driven by actions of people. On the level of shots, films like this are primarily constituted of medium shots, a type of shot where background and characters are about equally visible, similar to much of our day-to-day perception of the world.[27] However, this does

[20] Marrati, 7.
[21] Marrati, 24.
[22] Marrati, 3.
[23] Cliff Stagoll, 'Becoming', in *The Deleuze Dictionary*, ed. Adrian Parr, Rev. ed (Edinburgh: Edinburgh Univ. Press, 2010), 25–26.
[24] David Deamer, *Deleuze's Cinema Books: Three Introductions to the Taxonomy of Images* (Edinburgh: Edinburgh University Press, 2016), 29.
[25] Deleuze, *Cinema I*, 70.
[26] Marrati, *Gilles Deleuze*, 46.
[27] Deleuze, *Cinema I*, 70.

not exclude perception-images (long shots) and affection-images (close-ups) from the film. All are present, but one is always dominant. Although films that are dominantly perception-images or affection-images also exist in pre-war cinema, the action-image is clearly prevalent.[28] This is partly due to the enormous influences of Griffith and Eisenstein who were pioneers in active montage.

The Second World War marks a turning point for cinema and the emergence of a new type of image. As already indicated, Deleuze believes that this is nota new historical era of cinema, but more a switch in perception, where history that was defined by human action is replaced by concepts of becoming and the event. The notion of a universal history, one coherent narration of the past applicable to the whole world but based on human agency as described previously by Hegel,[29] now fades away after the inexplicable horrors of World War II.[30] This development is in line with Benjamin's idea that perception changes with history as he writes:

> During long periods of history, the mode of human sense perception changes with humanity's entire mode of existence. The manner in which human sense perception is organized, the medium in which it is accomplished, is determined not only by nature but by historical circumstances as well.[31]

Human perception therefore changed with mechanical reproduction, killing off the aura of art (the specific distance needed to experience its singularity),[32] but cinema itself also affects perception, since it is dependent on technology. As different types of images, including differing montages, shots, frames, emerge with advances in technology, the way we look at them and the world also changes. Contemporary examples are three- or even four-dimensional movie experiences, but also the recent trend of virtual reality, all of which change our perception literally along with the technologies, since they are the medium for it. For Deleuze, however, technology is not the essence of cinema. Technology simply makes certain characteristics of it emerge more prominently than others, but fundamentally the aesthetics of cinema are virtual.[33] This is why he primarily

[28] Marrati, *Gilles Deleuze*, 54.
[29] Georg Wilhelm Friedrich Hegel, *Phenomenology of Spirit*, trans. A.V. Miller (Motilal Banarsidass Publishers, 1998), 17.
[30] Marrati, *Gilles Deleuze*, 65.
[31] Benjamin, 'The Work of Art in the Age of Mechanical Reproduction', 325.
[32] Clive Cazeaux, ed., *The Continental Aesthetics Reader* (London ; New York: Routledge, 2000), 300.
[33] Deleuze, *Cinema II*, 274.

discusses different categories of images, for instance action, perception and affection in the movement-image, and not necessarily their supporting structures. By creating action, perception and affection for the viewer cinema shapes spectatorship, influences our subjectivity and thus changes our perception.[34] According to Deleuze, cinema does not reproduce the reality, but renders visible what would not be otherwise.[35] It creates something new and changes perception by "undoing that which our habits, needs, and laziness have done, in order to make visible […] the perceptions, affects and relations of thought that cinema itself was able to create."[36]

Time

After World War II, cinema fell into a crisis and the role of the image changed. The setback of the American dream, the large use of cinema during the war as propaganda, and the overload of images were all factors that contributed to this change. Italian neorealism emerged where, characters' (re)actions were no longer what drove the film. Instead their environment existed regardless of what they did or did not do. As Marratti explains, the events of the war "tore apart confidence in human action: we no longer believe that an action can have bearing on a global situation or unveil its meaning even in part; we no longer believe in human becoming of the world."[37]

Without the notion of universal history cinema's space and time are affected. Spaces, such as demolished post-war cities seem disconnected and empty, hard to describe and difficult to react to. Consequently, the action-image loses its dominant position and instead, "time is no longer subordinated to movement, but rather movement to time".[38] This means that films are not so much focused anymore on the actions of the characters, but rather that time 'happens', no matter the action or non-action of characters. Therefore, time becomes the focus of the image, and new ways of displaying it on screen are developed. An event of the time-image can exist in multiple time structures and concealed elements of time are visualized.[39] The time-image also explores the non-chronological dimensions of time, creating a cinema that makes the

[34] Pisters, *The Neuro-Image*, 31.
[35] Marrati, *Gilles Deleuze*, 38.
[36] Marrati, 41.
[37] Marrati, 63.
[38] Deleuze, *Cinema II*, x.
[39] Deleuze, xi.

viewer think.[40] Examples of typical time-images that Deleuze discusses are films by Resnais, Antonioni, Ozu, Godard and Tarkovsky. In these films, the actual and virtual are crystallized, showing time that is unlinked from (bodily) movement more directly and therefore less organically than before.[41]

The movement-image is rooted in habits of the present, based on sensory-motor action.[42] The time-image however, is simultaneously in the past/future and in the present, or at least belongs to both. As a result, the present has become a dimension of the past.[43] Since an object is now not only linked to action (not sensory-motor), an optical and sound image emerges, which touches upon the subjectivity of time itself, which now has become our only subjectivity as we have no more individual agency.[44] This image highlights its own actual and virtual dimensions. The actual image here means the 'thing' existing in the present, such as the projection on the screen, while the virtual image points to its past that exists at the same time.[45] By blurring these categories, the time-image can be perceived as confusing, fragmented, circular, repetitious, different… The confusion arises because some aspects seem paradoxical. What the time image does is, in a sense, breaking down dichotomies we believed to be clear-cut. It links the actual image (the 'thing' existing in the present) and virtual image (the presents' simultaneous past) in a circular way.[46] The projection of an image we see on a screen in the present now relates differently to its virtuality, its intangible happening as an "incorporeal event"[47] and its past/future. The time-image is thus more closely linked to (virtual) thought than to action, as it touches directly upon the viewer's subjectivity in a temporal or spiritual way.[48]

It is important at this point to stress Deleuze is opposed to regarding cinematic images as representations (of reality for instance). A thing is not simply duplicated on the screen, but the image is itself a thing, opening up new temporal dimensions and

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[40] Marrati, *Gilles Deleuze*, 76.
[41] Gregory Flaxman, ed., *The Brain Is the Screen: Deleuze and the Philosophy of Cinema* (Minneapolis: University of Minnesota Press, 2000), 26.
[42] Pisters, *The Neuro-Image*, 137–38.
[43] Pisters, 138.
[44] Marrati, *Gilles Deleuze*, 76.
[45] Marrati, 71.
[46] Marrati, 71.
[47] Constantin Boundas, 'Virtual/Virtuality', in *The Deleuze Dictionary*, ed. Adrian Parr, Rev. ed (Edinburgh: Edinburgh Univ. Press, 2010), 300.
[48] Marrati, *Gilles Deleuze*, 72.

mental states that a mere representation (or reflection) could not.[49] What goes on inside the mind is related to the outside, but not an exact reflection of it. In fact, there is no such boundary between the mental and the physical world, because "memory and thought are not only psychological realities 'inside' our minds, or brains: they exist, or insist in time".[50]

[49] Deleuze, 'The Brain Is the Screen: Interview with Gilles Deleuze on "The Time-Image"', 53.
[50] Marrati, *Gilles Deleuze*, 72.

2. The brain is the screen?

Deleuze believes in the specificity of cinema, meaning that cinema differs from other art forms and other types of media. When he expressed 'the brain is the screen' in the 1986 interview to Cahiers du Cinema, this hard to grasp sentence epitomized his work on cinema. Apparently for him cinema is thus more closely tied to our brain than any other art. It is therefore important to understand properly in what way exactly, which is what I will delve into in this section.

In order to fathom how the brain is the screen in a contemporary context, I will use Malabou's ideas on plasticity and also refer to Pisters, who introduces a third image-type in addition to Deleuze's distinction between movement-image and time-image: the neuro-image.[51] Pisters speculates that if the movement- and time-image are linked to specific activity areas of the brain, the neuro-image could be linked to other areas. The neuro-image is characterized by, among other things, close ties neuroscientific brain processes and an omnipresence of media screens.[52] These two aspects will be discussed below throughout brain and screen.

Plasticity of the brain

As Pisters explains, Deleuze's views on cinema are closely linked to brain processes and neurological knowledge.[53] When stating "Thought is molecular, there are molecular speeds that make up the slow being that we are. […] The circuits and links of the brain do not pre-exist the stimuli, granules or corpuscles which trace them."[54], Deleuze offers us his take on the mind-body problem. The brain is not a fixed physical entity imbued with our thoughts (or soul) and there is no real separation between thought and brain, because both influence each other in a deeply intrinsic way. Brain and thought are not elements in different categories and material and immaterial are not seen necessarily as separate and dichotomous.

Malabou shares this view on the brain. More relevantly, for her the question is not about monism or dualism necessarily. Rather, she insists that we should become conscious of the brain (the question then shifting to 'what should we do with it?'). As she explains: "The brain is a work and we do not know it. We are its subjects –authors and

[51] Pisters, *The Neuro-Image*.
[52] Pisters, 2–3.
[53] Pisters, 3.
[54] Deleuze, 'The Brain Is the Screen: Interview with Gilles Deleuze on "The Time-Image"', 48–49.

products at once- and we do not know it."[55] Calling the brain 'a work' refers to its continuous development, the way it changes over time, like a work in progress. This work is therefore defined by its plasticity. The reason we do not know of this developmental characteristic is that we take it for granted. Like our habits, brain plasticity is so engrained in us that we pay no attention to it. The concept of plasticity entails the ability to give and receive form.[56] This process is contradictory, because it results in creation and destruction simultaneously.[57] When Deleuze states that the brain does not pre-exist the stimuli, this is exactly what he refers to. The brain is constantly shaped by the impulses that it receives, but at the same time also plays an active, formative role. Neuronal connections are made, modified and repaired when necessary, all due to the brain's plasticity.[58]

However, plasticity is not only something distinctive of the brain. We are not conscious of our brain's capacity to mold, because that same plasticity is also all around us, so we do not notice it.[59] The world can be configured (think of environmental impacts by humans), but we seem to take this for granted, until it is too late. In order to understand plasticity more precisely, it is crucial here to distinguish plasticity from related concepts such as rigidity, elasticity and flexibility. Rigidity is the opposite of plasticity, something rigid is fixed and cannot change its form. Previous conceptions of the brain all relied on fixed structures and which could not easily change form and this rigidity is where they misconstrued it.[60] Elasticity on the other hand is closer to plasticity, but differs because, while elasticity also causes change in form, it always returns to the original. Plasticity is more solid than that, in the sense that it retains its new form and cannot necessarily go back.[61] Finally, flexibility is the notion deceiving us from true consciousness of plasticity according to Malabou.[62] While the world around us is plastic, we impose on it a system of (neoliberalist) flexibility. But flexibility is only a small part of plasticity. It is a passive state, in the sense that one changes to adapt instead of creating.[63] The two are often conflated however, and flexibility dominates in

[55] Malabou, *What Should We Do with Our Brain?*, 1.
[56] Malabou, 5.
[57] Pisters, *The Neuro-Image*, 342-343n2.
[58] Malabou, *What Should We Do with Our Brain?*, 17.
[59] Malabou, 9.
[60] Malabou, 4–5.
[61] Malabou, 15.
[62] Malabou, 9.
[63] Malabou, 12.

society. In neoliberal capitalist society, office management structures for instance are following the development of neurological findings and are now becoming more decentralized and horizontal than ever.[64] The individual is left to themselves, fully responsible for every action and expected to adapt to every situation. In the neuro-image, we often see images of unusual brain plasticity, unable to adapt to flexibility.[65] Neuro-images deal with mental instability (powers of delirium), it is unclear what is real or illusion (powers of the false) and deep sensations are provoked (powers of affect). All of these are attributes that are not compatible with the notion of neoliberalist flexibility, as they are in a sense irrational and irresponsible.

The misplaced focus on (rigid) flexibility which is discussed by Malabou comes partly from the neurosciences, which tend to describe the brain too much in this way, making it easy to misinterpret the meaning of plasticity. All the while however capitalism produces the same flexibility reinforcing in turn the neuroscientific descriptions. Neurosciences have uncovered plasticity and, in this regard, also hold a potential power of resistance to flexibility. However, since they take their inspiration from world phenomena (such as machines, algorithms or management strategies),[66] they thus pose no real danger for the capitalist neoliberal system, exactly because they function within it. As such, capitalism continues to enforce a mandatory flexibility that is productive within its structure, but this flexibility is also destructive since a lot of (plastic) potential is discarded. It is this mechanism that prohibits us to understand the potential of the brain, our potential for difference and creation. According to Deleuze this dynamic can only be truly resisted through art.[67] Indeed, many films, and especially neuro-images uncover the madness of brain and world, sometimes even demonstrating that it is not worthless to be "unemployable"[68] in neoliberalist terms and that unleashing plasticity can actually give great power.

Between brain and screen: 'is'

For Malabou, not only the brain, but also the world has plastic potential. However, with the dominance of flexibility we are blind to it, and therefore also blind to our own brain

[64] Malabou, 42–44.
[65] Pisters, *The Neuro-Image*, 42.
[66] Malabou, *What Should We Do with Our Brain?*, 53.
[67] Pisters, *The Neuro-Image*, 7.
[68] Malabou, *What Should We Do with Our Brain?*, 68.

capacities. In the same way as she discusses the world in general, Deleuze discusses the screen when he says: "the screen, that is to say ourselves, can be the deficient brain of an idiot as easily as a creative brain".[69] The screen therefore has a certain potential for creation that can also be left unused. According to Deleuze, this is the case with 'bad cinema' which simply follows the brain (and screen) circuits that are already present. Our brain knows what we see because we have seen it before, it is simply a representation of it.

In turn, good or 'true' cinema does work like a creative brain. It can touch upon themes more deeply and therefore also reaches us (and our brain) differently, creating new paths instead of simply following them.[70] It is exactly this uniqueness which Deleuze explicates in his *Cinema* books. Movement- and time-images can, through practices such as montage, show what we cannot usually see (movement and time) and therefore have the power to move us differently than representations. In a sense, what he seems to mean is that true cinema itself has a lot of plasticity and this capacity to, through its artificial circuits, develop our seemingly 'natural' ways of doing and thinking is the reason why it is so closely linked to our brain. Both the plastic film screen and the plastic brain are part of the world and therefore have power to form it.[71] Since we are clouded by the notion of flexibility, we must hope that we can be triggered through the screen, and thus through our own brain. In this way, cinema's plasticity can have its impact on the rest of society.

The fact that cinema shapes us, and has a real effect on our brain structure, becomes clear in Pisters' discussion of mirror neurons.[72] These are neurons that are activated when we see someone doing something. Our neurons subsequently mimic the paths which the neurons of the observed person take when performing that action, causing our brain to duplicate the perceived action or feeling. The neurological connections for observing are thus similarly used for action. This mechanism works just as well whether the person who does something is in front of us or on a screen. The reason we do not go around imitating everything is that the actual action is somewhere stopped by the brain. In this sense the brain itself works as a screen, filtering stimuli that have entered it and producing responses that do not directly represent what we see,

[69] Deleuze, 'The Brain Is the Screen: Interview with Gilles Deleuze on "The Time-Image"', 49.
[70] Deleuze, 49.
[71] Malabou, *What Should We Do with Our Brain?*, 39.
[72] Pisters, *The Neuro-Image*, 30, 116–21.

although sometimes we might not be able to help ourselves from yawning or smiling too when someone does this. However, even if we do not usually mimic, we do 'feel' with the actions on the film screen, creating a new type of response rather than a copy. What we see affects us in a similar way as if we were to experience it. This mechanism is further proof that images are not mere representations and can actually have affective power, a stance that Deleuze defends as previously explained in part 1.

Consequently, it becomes clear that 'the brain is the screen' does not mean that one represents the other or vice versa. The bond between them is more than a simple reflection or identity, but rather refers to a type of cocreation, a shared plasticity and a potential to "form and deform into the world".[73] Spectatorship is thus not a passive state and implies a becoming (a creation of difference) as well, at least in neurological terms.[74] Therefore, the screen is not a 'shield' between the world and our mind and it is situated neither outside nor inside.[75] Instead its position is both in as well as out, making it inherently contradict itself. This contradiction aids in deconstructing the dichotomy between inside and outside. Deconstruction is a form of critiquing (language) structures we take for granted, such as binary oppositions, and was originally coined by Derrida.[76] As Cazeaux explains, thought boundaries are always "indi*visible* from the kinds of boundary we encounter in visual experience".[77] However, the sometimes indeterminable nature of sensory experiences makes it more apparent that binaries do not always hold up the way we believe them to. This is what the screen does in this case with its ambiguous 'placement', and what cinema further carries on regarding mind and body or virtual and actual for instance.

Just as the screen influences and determines the brain, the brain also determines the screen. As Pisters notes, the brain is "a continuously changing process and therefore fundamentally connected to movement and time".[78] Indeed, plasticity is a movement happening in time, bringing us back to Deleuze's two image-types. When Pisters argues for the neuro-image, she says that cinema has now entered the 'brainspace', sometimes in quite literal ways. Because it is also closely and directly linked to the brain, the neuro-image is similar to the time-image. However, the role of the brain itself has now blown

[73] Malabou, *What Should We Do with Our Brain?*, 72–77.
[74] Pisters, *The Neuro-Image*, 119.
[75] Pisters, 27.
[76] Cazeaux, *The Continental Aesthetics Reader*, 373.
[77] Cazeaux, 375.
[78] Pisters, *The Neuro-Image*, 16.

up in it. She gives the example of the film *Fight Club*,[79] in which the beginning title sequence simulates a rollercoaster ride through the brain. We follow the circuits from the perspective of a neuron, making clear (or hinting) that the film takes place from within this brain, the brain of the main character played by Edward Norton.[80] This includes seeing his hallucinations and experiencing its malfunctions as he does, and also not knowing until the very end of the film that they were hallucinations and malfunctions. Additionally, the sequence was fashioned with the help of actual neuroscientific mapping imagery of the brain, exemplifying the closeness of (neuro)science to contemporary cinema. In this sense, even more obviously than before, the brain is the screen and the screen is the brain, possibly leading us closer to this recognition Malabou seeks for.

In the movement- and time-image, we experience characters and their actions from within, the difference being the impact of these actions on the world. In this sense, we see through the characters' eyes. In a neuro-image however, we see not through the eyes but through the brain, experiencing their mental world.[81] Of course, the eyes and the stimuli they receive are closely linked to the brain, but what Pisters means is that the dichotomous division between brain and thought (body and mind) is now even more thoroughly dismantled than with the time-image. Time-images are characterized by a switching from actual to virtual, from 'reality' to mental world. However, as we embark into the mental world in neuro-images, the switching itself becomes indistinguishable.[82] In *Fight Club*, we are not even aware of our perceptive position (through the 'brain' of the narrator) until the very end of the film, and even then, much is still unclear of who and what was virtual and/or actual.[83]

Pisters hints that the relationship between brain and screen is stronger within the neuro-image than the other types, one of the reasons being that it has become so close to the field of neuroscience.[84] This seems to imply a larger plastic potential to resist the culture of flexibility. However, forms of resistance are frequently absorbed into the system as well, becoming almost intrinsically part of it and making their true

[79] David Fincher, *Fight Club*, Drama, 1999, http://www.imdb.com/title/tt0137523/.
[80] Pisters, *The Neuro-Image*, 15–16.
[81] Pisters, 14.
[82] Pisters, 58.
[83] William Brown and David H. Fleming, 'Deterritorialisation and Schizoanalysis in David Fincher's "Fight Club"', *Deleuze Studies* 5, no. 2 (July 2011): 286, https://doi.org/10.3366/dls.2011.0021.
[84] Pisters, *The Neuro-Image*, 127.

resistance obsolete. According to Marks, who has written about documentary films and their relation to the notion of reality, this is what is happening to the mental-image.[85] The mental-image frequently comes up in documentaries and emerged first as part of cinema's adaptation when the movement-image stepped back for the time-image to surface. Coming up between the action-image and affection-image, the mental-image (an element of the time-image also termed relation-image) creates images outside of sensory experience.[86] In this way, mental-images are a tool to make us aware of what we know about our actions, piercing through previous habits. This awareness reaches the film itself, in the sense that it may become aware of itself. Marks discusses this reflexivity through documentary film, where it has become common practice to insert shots of the filming setup and for the maker to relate their own position to the subject. Pisters similarly discusses 'metafilms' (films about making films), which can evoke certain feelings of discomfort, as boundaries between reality and fiction become blurred (in a similar sense to the narrator's perspective in *Fight Club*).[87] However, being reflexive or being a metafilm is not sufficient for a film to be true cinema. Marks mentions how Deleuze "remarks wearily that the world has come to resemble a bad film; even reflexivity has become a cliché".[88] The reflexive mental-images have become such a big trend that they are now causing cinema to stagnate.

Once a certain form of mental-images has become established (become a cliché), it loses power as a form of resistance. This also implies that its actual meaning, not as a single act, such as certain montage techniques or practices to create them, but as one of the phenomena that lets us foster a creative relation with our brain, becomes lost. Although metafilms and explicit reflexivity are part of the mental-image, they are only some of its more obvious examples that appear on the surface. Pisters notes this too: "Indeed, fiction and reality intermingle in strange ways in the neuro-image; however, this intermingling occurs not only in metafilms but also in the whole of contemporary image culture."[89] True mental-images/neuro-images thus do need to be so homogenous or direct. Following the true power of cinema, it could shine through a film in a more

[85] Laura Marks, 'Signs of the Time: Deleuze, Peirce, and the Documentary Image', in *The Brain Is the Screen: Deleuze and the Philosophy of Cinema*, ed. Gregory Flaxman (Minneapolis: University of Minnesota Press, 2000), 199.
[86] Marks, 198.
[87] Pisters, *The Neuro-Image*, 120.
[88] Marks, 'Signs of the Time: Deleuze, Peirce, and the Documentary Image', 200.
[89] Pisters, *The Neuro-Image*, 121.

implicit manner, leaving our brain feeling tingled in a way we might not immediately be able to explain (but which I have explained here previously). We can already notice now, when discussing such misinterpretation or misuse of a resistant force, a parallel between the popularization of reflexivity in film and that of flexibility which Malabou writes about. Both originate from something powerful and creative, but have been reduced to a cliché, a habit that traps us in its ways. This example thus illustrates well how the brain and the screen essentially face the same problems.

Brain and screen are one, a relationship that becomes more apparent with the rise of the neuro-image. Their connection can serve as a way of resisting dominant structures, but resistance can just as easily become part of the system too. The question now arises what the neuro-image can do specifically to counter a regime of flexibility. This will be discussed in more depth in the following section.

3. Through the screens

In many regards, Pisters' neuro-image is an intensified time-image.[90] Both have the effect of making the virtual visible, although the time-image focuses on the virtuality of film and the neuro-image on the virtuality of the brain.[91] Both situate the 'brainscreen' between internal and external,[92] but it could be argued that the time-image remains closer to the screen and the neuro-image shifts further towards the brain. As previously discussed, film and brain have a deep intrinsic connection. Whether the neuro-image is a separate or sub-regime from the time-image is an interesting question, certainly regarding the taxological aim that Deleuze had from the start. Nevertheless, it is not very relevant for this thesis. What cannot be denied however, is a great change in the context of cinema. When Deleuze discusses the film screen, this is quite certainly the big screen at the cinema, which was primarily the place to see films before and around 1983 and 1985 (the publication years of the Cinema books). Today, technology has evolved, and screens/displays have multiplied in our lives. Although they are not solely meant for it, we now have the possibility to see films on TV screens, smartphone screens, computer screens, tablet screens, smartwatch screens and more, next to the traditional cinema screen. This prevalence of screens and technologies can be termed a "digital screen culture".[93] The digital culture allows for new types of media to emerge among the traditional structures, which themselves are also changing (often being digitalized) but not necessarily disappearing.[94] Similarly to the phenomenon of World War II, digitalization of our society could be contributing to yet another shift in perception, and therefore it is important to re-evaluate contemporary cinema.

Pisters argues that the neuro-image is rooted in the sign of time of the future, whereas movement- and time-image are formed under present and past respectively.[95] This dimension of the future connects to the virtual through, for example, an insistence on cosmic themes. The cosmic is present in all image-types and signs of time, but more explicitly and differently in Pisters' image-type.[96] Where in the time-image the emphasis was on travelling from past/present to the future, away from here and now; in neuro-

[90] Pisters, 136.
[91] Pisters, 71.
[92] Pisters, 306.
[93] Pisters, 6, 25, 148.
[94] Pisters, 68.
[95] Pisters, 138–40.
[96] Pisters, 148–55.

images we increasingly travel from the future back to the present/past, undertaking journeys within, or back to ourselves.[97]

Another way in which the neuro-image focuses on the future is by posing questions about the future of cinema.[98] The neuro-image is both a part of and interacts with our technological and digital networks. Because of this, a struggle arises for cinema to define its existence. 'The brain is the screen', but which screen(s)? In her book, Pisters counters David Rodowick's view that film nowadays survives only as information and as 'regular' art, and instead argues that film as film (with its specific connection to the brain) is not dead. However, the traditional conception of cinema on the big screen seems to be gone. Therefore, Pisters terms cinema as 'undead' in order to illustrate its reliving through the transmediality of the neuro-image.[99] In addition, Andrew notices the 'soul of cinema', by which he means "what the cinema at any given moment permits those devoted to it to think", as being on the move.[100] Indeed, according to Flaxman, the screen which Deleuze discusses is not necessarily only the one we find in the cinema. "'[T]he brain is a screen' in the sense that it is a filter that extracts itself from chaos. This screen is a form of relation, of interchange, of mutual synthesis between the brain and the universe."[101] The film screen is therefore more defined by its virtuality than its actual appearance. 'Empty' screens cannot attain this bond with the brain by themselves. However, with the excessive production of visual material full of clichés and repetitions in capitalist society, it is increasingly difficult to define where to find (and what remains of) true cinema.

According to Deleuze, cinema and other arts have a certain power to respond to the world around them. He terms this ability to constantly renegotiate their relationship as a "will to art".[102] The switch from the dominance of the movement-image to that of the time-image was a previous example of this. Something had to change in cinema in

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[97] Patricia Pisters, 'Temporal Explorations in Cosmic Consciousness: Intra-Agential Entanglements and the Neuro-Image', *Cultural Studies Review* 21, no. 2 (25 November 2015): 6, https://doi.org/10.5130/csr.v21i2.4323.
[98] Pisters, *The Neuro-Image*, 16.
[99] Pisters, 12.
[100] Dudley Andrew, 'The Roots of the Nomadic: Gilles Deleuze and the Cinema of West Africa', in *The Brain Is the Screen: Deleuze and the Philosophy of Cinema*, ed. Gregory Flaxman (Minneapolis: University of Minnesota Press, 2000), 215.
[101] Flaxman, *The Brain Is the Screen*, 16.
[102] Elizabeth von Samsonow, 'Egon Schiele: Vitalist Deleuzian', in *Art History after Deleuze and Guattari*, ed. Sjoerd van Tuinen and Stephen Zepke (Leuven University Press, 2017), 43; a concept originally mentioned by Riegl as *Kunstwollen*.

order to 'keep up' with a changed perception of the world. Deleuze himself already speculates on another will to art that would come with digital culture: "electronic images will have to be based on still another will to art, or on as yet unknown aspects of the time-image."[103] This is a hopeful perspective, directly countered by a recognition of the heavy choice every filmmaker is faced with when trying something new: "I am afraid that all methods may invalidate all will to art, or make it into a business, a pornography, a Hitlerism…".[104] The will to art is thus not necessarily eternal and can be killed off by subjection to for example capitalism or fascism. As previously mentioned, Deleuze believes in resistance through art, but generally resistance is not met with open arms by any dominant system, oftentimes assimilated or annihilated.

Back to the neuro-image and its many screens. How is cinema's true form of resistance (its will to art) surviving in our world of screens? Pisters tells us that the neuro-image follows a certain digital logic, the very same to which technologies adhere. "[The] dominant temporal dimension of the neuro-image connects to the logic of digital screen culture. […] The neuro-image mixes and reorders from all the previous image regimes, ungrounding and serializing according to a digital logic."[105] This includes for example database logic, which implies that films are structured like a database: (part of) an open archive overflowing with information from which fragments can be pulled out at random.[106] However, these logics (and other neuro-image characteristics) were already present in cinema before the rise of digital culture in the same way that characteristics of the time-image previously already existed in the movement-image.[107] As we know, the image-types do not exclude each other. In essence, they consistently coexist through their virtuality, even though one of them will always be dominant to us. Technically, one could say that the 'next' image-type is already present in current and past cinema. Screen multiplicity is part of the current dominant structure and cinema has found its way to respond to this (led by its will to art) by letting the neuro-image surface. Thus, the neuro-image should be ready to face the challenges of the screens with ardour; simultaneously adapting to the world, while also 'arting' and offering resistance to its structure.

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[103] Deleuze, *Cinema II*, 273.
[104] Deleuze, 273.
[105] Pisters, *The Neuro-Image*, 148.
[106] Pisters, 8–12.
[107] Pisters, 26.

Nomadism

Similarly to Pisters, Andrew argues for a second turning point in cinema defined by the new contexts of its exhibition and distribution, essentially starting with the introduction of the VCR.[108] Ever since this innovation, the viewer has acquired more and more agency in the cinematic system, through for example the remote control. He states:

> Let Hollywood colonize the globe […]; the 'soul of cinema' now emerges elsewhere, in movies assembled in scattered locations, then bicycled to outlying viewing sites and to diasporic cultures, the symbol of which is the film festival. The movies that today think the national beyond the nation travel from Rotterdam to Toronto to Berlin. Critics literally follow this moving camp to catch the rumor of cinema—and a rumor it is, for the 'soul of cinema' is passed around as though by word of mouth, a transitional idea existing in passage.[109]

This implies that there is no epicenter of true cinema productions anymore, a change that is further developed by the neuro-image's growing digital logic, additionally making the consumption of film increasingly mobile.[110]

According to Andrew, true cinema has become 'nomadic', a Deleuzian metaphor based on a way of life of nomadic peoples, relating to mobility, fluidity and a sense of freedom, opposing to the fixed State.[111] This concept is quite problematic and has received critique from postcolonial scholars such as Spivak, because while it is inspired by actual people's lives, Deleuze disregards the political difficulties they face every day regarding this lifestyle by using it in a purely virtual way.[112] Indeed, the concept of 'nomadism' has been used primarily to enrich a very Eurocentric field of philosophy, not taking into account its actual (political) significance. However, as Andrew notes, nomadism is never used by Deleuze with regard to cinema.[113] Here might lie a way to use the concept more responsibly than the metaphysical way Deleuze previously wrote about it, precisely because film combines virtual and political aspects so directly. Cinema has the potential to truly involve nomadic peoples in its nomadic ways, thereby merging

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[108] Andrew, 'The Roots of the Nomadic', 216.
[109] Andrew, 226.
[110] Pisters, *The Neuro-Image*, 237.
[111] Andrew, 'The Roots of the Nomadic'.
[112] Gayatri Chakravorty Spivak, 'Can the Subaltern Speak?', in *Colonial Discourse and Post-Colonial Theory: A Reader*, ed. Patrick Williams and Laura Chrisman (New York: Colombia University Press, 1994), 66–111.
[113] Andrew, 'The Roots of the Nomadic', 217–18.

and mixing the actuality and virtuality of the world.

Considering modern-day cinema, its virtuality already implies that it can come from anywhere and go anywhere, giving voice to many who are marginalized and who, through the power of cinema might be heard and listened to. Its nomadic aspect however, entails that the essence of cinema has become more acentered than ever through the transmedial nature of our time.[114] For Andrew, this entails that true cinema now often emerges as 'minor cinema', a type of cinema also termed 'third cinema' in reference to its shift of focus from First Cinema (classic Hollywood productions) and Second Cinema (European auteur cinema) to the 'rest of the world'.[115] However, the main characteristic of minor cinema is its political resistance and engagement with its own minority position.[116] This does not mean that a Hollywood film cannot be true cinema anymore, but simply that Hollywood's movement-images or European time-images are not the only production styles anymore. Minor cinema allows for very local perspectives to emerge, but the films are connected (and connect us) through their aim to resist the status quo.[117] Aesthetically, this can be distinguished in a heavy mixing of established cinematic codes, creating works that do not fit into anything familiar.[118] As Flaxman notes, nomadism implies to "conceive of a thought without an overarching image".[119] While the neuro-image adheres to certain characteristics and will always have this strong connection to the brain, the fact that the soul of cinema is now produced and distributed all over the globe also suggests that the image itself becomes harder to identify as such, since it lacks a consistent aesthetic style.

Instead of existing within a set territory, the possibilities of technology serve as tools for cinema to create new territory.[120] This is exemplified by changes in cinema's archival quality as addressed by Pisters. Film has always been part of (creating) an archive, shaping our memory of history.[121] With digital technology however, archives are now virtual or digital databases and are becoming increasingly accessible and

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[114] Andrew, 216.
[115] Andrew, 225; Flaxman, *The Brain Is the Screen*, 34 I will further use 'minor cinema' here, as what I want to emphasize is more so the virtual dimension of resistance than the actual geographical provenance of nomadic films.
[116] Pisters, *The Neuro-Image*, 229.
[117] Pisters, 264–65.
[118] Pisters, 257.
[119] Flaxman, *The Brain Is the Screen*, 53n138.
[120] Claire Colebrook, 'Nomadicism', in *The Deleuze Dictionary*, ed. Adrian Parr, Rev. ed (Edinburgh: Edinburgh Univ. Press, 2010), 186.
[121] Pisters, *The Neuro-Image*, 222–23.

diverse. As the contents keep changing and they grow more and more open, today's archives can be termed as "alive".[122] Complicated histories are constantly contested from all sides, which now have the opportunity to contribute, keeping our collective memories constantly unfixed. This results in a future that is just as open as the past.[123] Through film, and especially the neuro-image, as a living archive (whether fictional or not), reality of past, present and future is constructed and constantly remixed and changed.[124] Being so closely related to technology, neuro-images follow a digital logic, inherently entailing such a "deep remixability".[125] Next to mixing and creating heterogenous cinema styles, one can concretely also think of films being released in different versions, with alternative endings, or featuring extra scenes, offering alternatives for the viewer to choose from; but even more so, of the possibility for anyone to directly interact and interfere with the film, for instance by adding and uploading own versions of montages or voice-overs on the Web, thereby potentially changing meaning and memory through the digital archive.[126]

Cinema now inhabits territory in a nomadic way. This means that its existing structures and the digital space which our technology provides do not determine it, but rather that cinema "fills the space from within".[127] Instead of adapting to technological innovation, cinema uses these technologies to recreate itself through its will to art. While for Deleuze film theaters were the home of cinema, Andrew's discussion of cinematic nomadism dates back to the year 2000, where film festivals and DVD's are relevant additions to exemplify its workings. One can therefore not ignore that the nomadic aspect has only grown further in recent years through the enormous spread of the Internet. Many of the festivals that Andrew mentions for instance now have also created their own streaming services, making their content available year-round in literal databases.[128] In this sense the 'soul of cinema' and its 'space' is digitalized further and further, while still coming to us from many different actual places.

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[122] Pisters, 222.
[123] Pisters, 221.
[124] Pisters, 253.
[125] Pisters, 8.
[126] Pisters, 10.
[127] Colebrook, 'Nomadicism', 187.
[128] e.g.: International Film Festival Rotterdam, 'IFFR Unleashed - Not Your Everyday Films', accessed 6 June 2018, https://www.iffrunleashed.com/; Göteborg Film Festival, 'Draken Film | Streama Hundratals Handplockade Filmer Från Hela Världen - 79 Kr per Månad', accessed 6 June 2018, https://www.drakenfilm.se/.

As Colebrook writes: "nomadic space is produced through its distribution".[129] It is created through its occupation which reveals where people or entities accumulate and remains always in movement.[130] Naturally, the field of cinema emerges in part from the actual distribution of films around the world, but should be emphasized is how it in fact originates from its virtual distribution. The nomadic shift in the conception of space is first and foremost felt 'virtually' in films, seeing as this virtuality is what defines cinema. This translates into neuro-images coming from minor cinema usually not providing us with the chronicle of one hero, or a universal type of (hi)story relating to a general human condition.[131] Instead, they 'create' a people, through a sort of "personal fiction".[132] This results in films about people(s) that are missing or fragmented.[133] Such images are specific, so specific that they actually might not 'represent' anyone at all. Although they can be political on a local level, nomadic films of the neuro-image also remain without fixed cinematic identity. Various films might show unconnected places and people,[134] they might function as their own micropolitical acts, but they cannot be determined or delineated as they have no guiding principle.[135]

Nevertheless, regardless of their 'non-universal' nature, nomadic films are now accessible to many people through the multiplication of screens and digitalization, fostering a relation to the outside of their direct territory.[136] Such a relation automatically creates a relation in response, from the viewer on the outside to the nomadic. In this sense, all nomadic films do contribute to the continuously moving dynamics of cinema regarding the questioning of virtual/actual, fiction/reality, and personal/collective for instance.[137] Each film inhabits the cinematic, now digital or digitalized space in its own way, changing and enriching it for previous and present cinema, but also for films to come. With its database logic, the neuro-image contributes to the digitalization of the archive, making our collective world memory as slippery as ever. Furthermore, the archival characteristic of film now not only bring past to the

[129] Colebrook, 'Nomadicism', 187.
[130] James Williams, *Gilles Deleuze's Difference and Repetition: A Critical Introduction and Guide: A Critical Introduction and Guide* (Edinburgh University Press, 2013), 71.
[131] Pisters, *The Neuro-Image*, 229.
[132] Pisters, 254.
[133] Pisters, 229.
[134] Pisters, 227.
[135] Williams, *Gilles Deleuze's Difference and Repetition*, 71.
[136] Pisters, *The Neuro-Image*, 258–59.
[137] Pisters, 254.

present, but also to the future.[138] The 'soul of cinema' has become completely unfixed:[139] it is not linked to a place or time anymore, but instead wanders through a world of screens as it has been deprived of any original 'land' but gains new terrain as it goes.

Diffraction

Now that specificities of cinema, brain and screens have been established, I want to continue my analysis of cinema and the brain in this last section by posing the question how the specific power of cinema has changed in digital screen culture. In order to do this, recent theories by Karen Barad offer useful insights. Barad is originally a physicist who has developed a theory of agential realism. She has written about the phenomenon of diffraction as a method to theorize difference.[140] I will shortly discuss these here and demonstrate how connecting these concepts to cinema and Deleuze's crystal image is helpful to evaluate its power.

According to Barad's agential realism, not only humans or living beings have agency, but matter does so too. 'Things' impose certain limitations (they "kick back")[141] and are actively part of the becoming of the world, affecting and shaping phenomena.[142] In this sense, Barad urges us to not see the world through clear binary boundaries such as self and Other, subject and object, matter and discourse, inside and outside or science and social.[143] This is something Deleuze seems to agree with, as he attributes a power to film for making us conscious of the construction of these type of concepts as oppositions and providing us with new ways of perceiving them.[144] As I have argued before, cinema allows us think differently, questioning the relation between brain and thought, actual and virtual, or present and past/future.

Indeed, Pisters notes: "For Deleuze, the virtual is always connected to the actual but in a far more intimate way than by opposition."[145] It is through the crystal-image in its pure state that this entanglement happens, as "the actual and the virtual, without

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[138] Pisters, 227.
[139] Andrew, 'The Roots of the Nomadic', 216.
[140] Karen Michelle Barad, *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning* (Durham: Duke University Press, 2007).
[141] Barad, 214–15.
[142] Barad, 136.
[143] Karen Barad, 'Diffracting Diffraction: Cutting Together-Apart', *Parallax* 20, no. 3 (3 July 2014): 169, https://doi.org/10.1080/13534645.2014.927623.
[144] Constantine Verevis, 'Cinema', in *The Deleuze Dictionary*, ed. Adrian Parr, Rev. ed (Edinburgh: Edinburgh Univ. Press, 2010), 49.
[145] Pisters, *The Neuro-Image*, 248.

being confused, have nonetheless become indiscernible".[146] The crystal-image emerged with the time-image and refers to the 'crystallization' of the actual image with its own virtuality.[147] This is a confusing experience for the viewer, as it forces us to think differently and create new circuits.[148] Crystal-images thus simulate and stimulate the plasticity of our brain and, in this way, help us come closer to what Barad terms a "non-binary conception of difference".[149] As Pisters explains, with the neuro-image (which can be considered very closely related to the crystal-image) the viewer cannot even distinguish the switching between actual and virtual anymore.[150] In this sense, crystal-images can help us understand that everything is within the world, but also always an active part of it and we can never just position ourselves on the outside.[151] Different agencies, actual and virtual, are entangled together and shape and create each other.[152] Barad explains how objects and their agencies "emerge from, rather than precede, the intra-action that produces them."[153] This must immediately remind us of the concept of plasticity and the way Deleuze states that the brain does not pre-exist stimuli, but is shaped by them.[154] In fact, what I want to suggest is that these ideas are closely linked and I believe Barad can help to shed light on the question of the brain and screen in contemporary screen culture.

Lambert and Flaxman suggest that the future of cinema lies in the development of the crystal-image.[155] The newly surfaced digital logic of cinema encourages the crystal-image as its will to art as well. This is precisely because digital technologies already intrinsically blur our conception of virtual and actual. For Deleuze, the crystal-image is most clearly exemplified through the mirror: "[T]he mirror-image is virtual in relation to the actual character that the mirror catches, but it is actual in the mirror which now leaves the character with only a virtuality and pushes him back out-of-field."[156] Deleuze

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[146] Marrati, *Gilles Deleuze*, 73.
[147] Deleuze, *Cinema II*, 72.
[148] Marrati, *Gilles Deleuze*, 72.
[149] Barad, 'Diffracting Diffraction', 170.
[150] Pisters, *The Neuro-Image*, 58.
[151] Barad, *Meeting the Universe Halfway*, 37.
[152] Barad, 33.
[153] Barad, 128.
[154] Deleuze, 'The Brain Is the Screen: Interview with Gilles Deleuze on "The Time-Image"', 48–49.
[155] Gregg Lambert and Gregory Flaxman, 'Ten Propositions on the Brain', in *Diagrams of Sensation: Deleuze and Aesthetics*, ed. Darren Ambrose and Wahida Khandker (Coventry: University of Warwick, 2005), 124.
[156] Deleuze, *Cinema II*, 73.

cites the film *The Lady From Shanghai*[157] as a perfect crystal image, where in one scene, the characters are impossible to distinguish from their virtual reflections in mirrors, and end up having to smash the reflecting surfaces to end each other's lives.[158]

Current technologies have the potential to take this indiscernibility (crystallization) even further. A noteworthy example of this can be found in *Harry Potter and the Prisoner of Azkaban,*[159] the film adaptation of the third Harry Potter novel directed by Alfonso Cuarón. Here, we find a scene where the young wizards learn to cast a spell against a 'boggart', a creature that takes on the form of one's biggest fear. The boggart is kept in a mirrored wardrobe and as the scene begins, we see the wardrobe from the perspective of the students (we see their reflections), until the camera (which 'magically' is not reflected) passes through the mirror and we realize that our perspective might actually have been on the virtual side, the one of the students' reflections before. However, the scene ends with another such passage through the mirror, leaving the viewer dazzled as to which side of the mirror was the virtual and which the actual. This remains impossible to find out. Such a scene could only be produced with the help of computer generated imagery (CGI). What we see on the screen is thus brought to us by the power of digital screen technology, which is now profoundly entangled with cinema. By going through the mirror that opens up to our fears, we are provided with more than a representation and instead get to look into ourselves.[160] It is in this way that we thus directly explore our own actual and virtual dimension, or in other words, our brain and its plasticity. This demonstrates how through technology, cinema has the power to create and to come even closer to our brain.

Barad discusses reflection, not only as a physical phenomenon creating representations, but also as prevailing in the way we act, taking the form of reflexivity.[161] As discussed in part 2, we increasingly find such reflexivity in film (e.g. in the form of mental images), and although it is an interesting practice, in a sense it has become outplayed already. This 'meta-effect' just keeps being mirrored over and over

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[157] Orson Welles, *The Lady from Shanghai*, Crime, Drama, Film-Noir, 1948, http://www.imdb.com/title/tt0040525/.
[158] Deleuze, *Cinema II*, 73.
[159] Alfonso Cuarón, *Harry Potter and the Prisoner of Azkaban*, Adventure, Family, Fantasy, 2004, http://www.imdb.com/title/tt0304141/.
[160] Nerdwriter1 (Evan Puschak), *Harry Potter & The Prisoner of Azkaban: Why It's The Best - YouTube*, 2016, https://www.youtube.com/watch?v=3hZ_ZyzCO24.
[161] Barad, *Meeting the Universe Halfway*, 71.

again, producing nothing truly new. It can therefore no longer be integral to cinema's true form or part of its will to art.

It is interesting that Deleuze refers so specifically to mirrors for the crystal-image, especially since Barad makes a point to reject reflection as a productive practice.[162] Reflections are representations; they do not make a difference, they do not create and thus they are not 'plastic'. The rejection of representation is an important similarity between Barad and Deleuze,[163] but what we see in a mirror is a reflection. Despite this, Deleuze actively praises mirrors for their ability to generate difference. However, his mirrors can also be oblique, concave or convex, creating a distorted image of the actual.[164] In this sense, they do take their reflections further than a representation that we would judge as 'truthful'. This resolves one of Barad's objections to reflection/reflexivity, as she argues that reflexivity supposes that representations reflect reality. Barad criticizes the practice of reflecting upon representation, thereby putting "mirrors upon mirrors"[165] without creating anything new. As Malabou states as the final answer to her question: "Not to replicate the caricature of the world: this is what we should do with our brain."[166] By now, it should be clear that Deleuze and Pisters argue exactly for such potential in cinema, as this is what makes it such a specific artform.

Barad proposes diffraction, which does have this power to create, in contrast to the dominant practice of reflection/reflexivity. Diffraction is another optical phenomenon that is produced when any type of wave (water, light, sound etc.) under the right conditions encounters a barrier, such as a wall, screen or crystal of which they have the possibility to travel through.[167] This might involve the obstruction to have one or more slits, or the type of wave to be able to go through the obstruction material. Instead of going through the object in a straight fashion as one might expect at first, the waves 'diffract', meaning that they form a pattern that spreads them out, as if their bundle was sliced and rearranged.[168] Diffraction thus has to do with manifold cutting and reconfiguring which results in expansion of the waves.[169] In this sense, diffraction conflicts with the notion of opposing dichotomies, because these are formed by a single

[162] Barad, 29.
[163] Pisters, 'Temporal Explorations in Cosmic Consciousness', 1.
[164] Deleuze, *Cinema II*, 73.
[165] Barad, *Meeting the Universe Halfway*, 88.
[166] Malabou, *What Should We Do with Our Brain?*, 78.
[167] Barad, *Meeting the Universe Halfway*, 74.
[168] Barad, 74–79.
[169] Barad, 'Diffracting Diffraction', 168.

cut in two.[170] What Deleuze is leading up to with the crystal-image and its further development in contemporary cinema is in fact a type of diffractive cinema, cinema that makes a change, in our brains and therefore in the world. This already becomes clear in his terminology, since crystals are characterized by their quality as diffraction gratings.[171] The crystal-image thus implies something more than a virtual copy of the actual.

Barad uses the phenomenon of diffraction as "a tool of analysis for attending to and responding to the effects of difference".[172] In this sense, it is more than a mere metaphor or analogy, indicating another shift away from representation.[173] By using it, one is not trying to compare separate entities to find relationships, but instead looks at very specific entanglements, where more is at stake than just one thing colliding with or relating to another. Every phenomenon is a complicated knot and has its own specificity. Diffraction is a critical practice for making a difference in the world, because it is not only about understanding the differences between phenomena, but also "how they matter and for whom".[174] In this sense, diffraction is also closely tied to the political. In a recent article, Pisters connects Deleuzian ideas on cinema with Barad's diffraction: "Using [diffraction], we can see how our contemporary digital tools intra-act with our conception of time."[175] Through the neuro-image's orientation on the third synthesis of time, and the new transmediality of cinema, we have the apparatus to create a "future that differs from the past",[176] because it is through digital (screen) technologies that we can take the deconstruction of dichotomies further than ever. As Pisters remarks: "not only can content be remixed and recombined, but also different technologies (such as design, animation and live action) can be recombined."[177] These 'cutting and combining' techniques encourage diffraction in cinema and stimulate its plastic power. Diffraction thus exposes the close relations between technology/science, cinema and philosophy. Combined, these agencies can be diffracted into endless possibilities, working towards a different becoming of the world.[178]

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[170] Barad, 168.
[171] Barad, *Meeting the Universe Halfway*, 83.
[172] Barad, 72.
[173] Flaxman, *The Brain Is the Screen*, 36.
[174] Barad, *Meeting the Universe Halfway*, 90.
[175] Pisters, 'Temporal Explorations in Cosmic Consciousness', 4.
[176] Pisters, 4.
[177] Pisters, *The Neuro-Image*, 10.
[178] Pisters, 'Temporal Explorations in Cosmic Consciousness', 3.

Through true soul of contemporary cinema, we might start disentangling challenges of the present and future. Time in the neuro-image is recut more than ever,[179] however this recutting does not move us away from entanglements but manages to bring us closer to them, closer to their materiality. Pisters mentions contemporary neuro-image science fiction which, instead of moving into space towards the future, moves us back to earth, through a "future that is now".[180] This allows us to not only reflect on earth from a space perspective, but realize our intrinsic part in its entanglement in a diffractive way. Our past and present are now dimensions based on our visions of the future.[181] "The digital implies a database logic that allows for all kinds of reconfigurations, remixings, and re-orderings of past and present events."[182] These cinematic diffractions create difference, and such difference cannot go unnoticed by our brain.

[179] Pisters, *The Neuro-Image*, 303–4.
[180] Pisters, 'Temporal Explorations in Cosmic Consciousness', 8–9.
[181] Pisters, *The Neuro-Image*, 304.
[182] Pisters, 'Temporal Explorations in Cosmic Consciousness', 4.

Conclusion

The purpose of this work was to identify the cinematic relationship between brain and screen in digital screen culture. To this end, I have examined Deleuze's ideas on cinema and combined them with several more recent works on the topic. Starting with the movement-image, pre-war cinema showed movement through primarily the action-image. This had not been recreated before outside of our own 'natural' perspective. After World War II, the time-image emerged with its insistence on displaying time on screen through innovative cuts and montages. I want to emphasize again that when Deleuze writes about cinema, he usually refers to 'good' or 'true' cinema. For him, this true form is the soul of cinema, a type of idealized form of it which carries its will to art.[183] This means they are not necessarily the most popular or most commonly made films. Instead, these are the films which make visible the invisible at the time it becomes necessary. For the time- and neuro-image, this 'invisible' is the virtual dimension of reality,[184] which crystallizes with the actual in the crystal-image.

Cinema's essence is its connection to the brain, as it has the ability to foster thought-creating circuits.[185] Therefore, the brain is the screen and the screen (cinema) is also a brain. Film is thus characterized by the same plasticity that our brain possesses.[186] In a way, Deleuze's cinema books are more on the brain and its images than cinema in the classical sense.[187] Pisters' third image type, the neuro-image, introduces an even more explicit bond between brain and cinema by linking contemporary neuroscience findings to the screen.[188] We find ourselves surrounded by plastic potential, but unfortunately, we are unable to utilize it because we do not know of it.[189]

Especially in the form of the neuro-image can cinema help us to reclaim this creative power, as it combines a focus on the future with a return to ourselves.[190] The neuro-image shows us an exceptionally plastic brain and works in the same way.[191] This extreme plasticity emerges through its context in a culture of digital technologies which are deeply linked to the virtual. As I have argued, the place of cinema has shifted as

[183] Flaxman, *The Brain Is the Screen*, 34.
[184] Pisters, *The Neuro-Image*, 21.
[185] Pisters, 193.
[186] Malabou, *What Should We Do with Our Brain?*, 39.
[187] Lambert and Flaxman, 'Ten Propositions on the Brain', 120.
[188] Pisters, *The Neuro-Image*, 18.
[189] Malabou, *What Should We Do with Our Brain?*, 1.
[190] Pisters, 'Temporal Explorations in Cosmic Consciousness', 8.
[191] Pisters, *The Neuro-Image*, 52.

cinema has become acentered in actual as well as virtual space.[192] The multiplicity of screens to see and create films on and the database logic that influences cinema's archival function have caused a nomadic aspect to surface in cinema.[193] This entails a qualitative change in cinema, which has come to show very specific situations, peoples or places. Viewers might relate with more difficulty to these films, because these are not universal narratives anymore. Additionally, there are no specific visual traits that hold the nomadic neuro-image together. However, it remains political since, by creating or discussing a people that are missing, it enables "the transformation of established visions of the actual world".[194] A special type of thought is thus still created without the need for a coherent aesthetic.

Finally, I have discussed Barad's concept of diffraction, because it brings me to the final answer to the question of 'what constitutes the relationship between brain and cinema in digital (screen) culture'. I believe that this can be termed a *diffractive relationship*. The digital screen cinema of the neuro-image has the power to make us conscious of our brain because it combines cinema, philosophy and neuro-/technoscience, proceeding to cut, remix and recombine aspects of all image-types and time syntheses, thereby bringing us closer to an undecided and plastic future.[195] The practice of (re)cutting creates difference, or helps us to conceptualize difference differently.[196] Opening up the past by keeping it 'alive' and moving opens up the future for a different becoming of the world. In Barad's words: "The 'past' was never simply there to begin with, and the 'future' is not what will unfold, but 'past' and 'future' are iteratively reconfigured and enfolded."[197]

It is in this way that we are able to create new brain circuits, realizing the plasticity of our brain. The brain is the screen and "[t]he screen itself is the cerebral membrane where immediate and direct confrontations take place between the past and the future, the inside and the outside, at a distance impossible to determine, independent of any fixed point […]."[198] Keeping us undetermined, the screen thus

[192] Andrew, 'The Roots of the Nomadic', 216.
[193] Pisters, *The Neuro-Image*, 24.
[194] Pisters, 264.
[195] Pisters, 'Temporal Explorations in Cosmic Consciousness', 4.
[196] Barad, 'Diffracting Diffraction', 170.
[197] Rick Dolphijn and Iris van der Tuin, 'Interview with Karen Barad', in *New Materialism: Interviews & Cartographies* (Open Humanities Press, 2012), 66, https://doi.org/10.3998/ohp.11515701.0001.001.
[198] Deleuze, *Cinema II*, 130.

establishes difference within our brain, a difference that gives us power to change the world.

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