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The Displaced *Dispositif*

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## Abstract

“*Dispositif*” is a term used in film studies since the 1970s which describes the entire system of mechanical and human factors which together bring about the cinema experience. It therefore refers to (amongst other things) the space of the auditorium, the screen, the projection technology and the physiology of the spectator. Many of its qualifying components are masked from the view of participants in the system. The *dispositif*'s purpose is to set up the conditions for a specific type of cognitive experience, one which mirrors and extends (and in some readings, controls) the experience of its participants.

The Displaced *Dispositif* is a performance, designed for the space of a cinema theatre, but featuring the projection of fragments of early silent cinema on a coeval (1910s) film projector from the auditorium. The film fragments are live-scored by the sound artist, Shaun Lewin, using a combination of closely mic'd sources on the projector itself, luminance data from the projected image and EEG brainwave data recorded from participants during previous projections of the film. Displacing elements in the *dispositif* in this way, by shifting modalities, situating in parallel, feeding back and layering, draws attention to its hidden existence and creates the potential for a more knowing and informed participation in the cinema experience. It also serves to demonstrate the degree to which *dispositifs* of modern cinema spectatorship, which have morphed and proliferated since the widespread digitisation of film heritage, have radically altered both the technological and experiential qualities of the medium. By integrating EEG data, the performance adds the dimension of electrophysiological experience to the long tradition within experimental cinema of artists calling attention to Cinema's hidden structures. As well as challenging the dominance of the worldview propagated by the film industry, the performance also signals a means of re-engaging with the creative potential of the system itself, once

unshackled from its bonds to the reality effect and freed from the limits imposed by its commercialising instincts.

## The Displaced *Dispositif*

### Qu'est-ce que c'est, *dispositif*?

From a technological point of view, what we know of as Cinema is an agglomeration of many different technologies which achieved a certain critical mass in the dynamic interaction of social, economic and technological conditions available in the late 19<sup>th</sup> Century.(Punt, 2000). Since then, while retaining the name Cinema, albeit sometimes with qualifying epithets such as Silent or Classical, it has continued to accumulate additional features, most obviously perhaps, those which appeal to the auditory as well as visual sense. The concept of sensory appeal itself points to the fact that this composite technological system would be nothing, or rather do nothing, without the human agents who have both designed it and queued up in their masses to experience it. This construction of Cinema, specifically, the projection of moving images, with or without sound, to an audience in the shared space of a theatre, can be contained by the term *dispositif*, first brought into use by the French theorist, Jean-Louis Baudry, in the early 1970s. (Baudry, 1970, 1975, 1986). Although translated awkwardly as “apparatus” in some publications, it is now often used untranslated in English texts and has proved useful in defining a concept of the conditions of cinematic reception which can contain a wide variety of practices and experiences. It facilitates theoretical distinctions between one type of cinematic experience and another, and helps in parsing the contributions of the individual components while retaining awareness of a greater whole. (Kessler, 2006). It also grants an equal place to those components such that, for example, the human subject of cinema is not lost to sight while considering the role of film technology, and vice versa, making it particularly valuable for interdisciplinary research. As a term therefore *dispositif* is valuable to interdisciplinary studies of cinema, describing a system of

“surrogate” (Hochberg & Brooks, 1997) experience which includes darkness, a screen, projection equipment, a film, and human spectators and operators. Each of these features bears individual scrutiny and can be examined in much finer detail in terms of their role in the experience of cinema across time, a research process which, in turn, informs our understanding of film history.

One of the joys of studying early cinema is that the components of the *dispositif* are more obviously part of the experience. The subject /participant/ spectator is more aware of them because there are less veils drawn over the components of the system than in later forms of commercial cinema, which vigorously pursue the ever more virtually real. In contrast to the contemporaneous séance room or even the too-shapely leg of a table, the pioneer of early cinema, projecting from amongst the audience, took a showman’s delight in placing the technological component ‘on stage’, a practice which effectively co-opted the auditorium into the performance space and certainly augmented and perhaps even challenged, the spectacle of the screen. By implication, therefore, the spectators were also drawn in to ‘treading the boards’ and would consequently be more aware of themselves as a component of the *dispositif*.

Within ten years or so of the first public cinema shows, the prosaic demands of fire safety regulations forced a significant change in the *dipositif* by enclosing the projector (and projectionist) in a metal box or bricking them up behind the walls of the projection booths in the first purpose-built cinemas. (Enticknap, 2005). At the same time the projection mechanism itself became more enclosed. For example, individual components such as the intermittent movement were encased in a cast metal oil bath and the external shutter moved closer to the lens and was lost to sight behind a protective housing. The noise of the film advance mechanism became overlaid with the hum of electric motors. This trend towards the black boxing of cinema’s

components ceded power to the screen and promoted greater immersion in the image. With the bolstering of the reality effect of the screen stimulus, reflection of the spectator on their own agency would have decreased along with awareness of their presence in a system with potential for creative response and feedback.

Subsequent technological developments such as the advent of synchronous sound further rooted attention to the screen such that by the time of television's challenge to cinema's cultural hegemony in the 1950s, cinema's response and argument of differentiation was to expand the size of the screen and attempt to add a third dimension rather than to adopt an alternative strategy of revealing its true nature. This, rather, was the response of the avant garde of experimental film makers whose *dispositifs* of small halls, cafes and basements and portable 16mm projectors re-established something of early cinema's potential for a dynamic viewing environment (which would itself lead to developments termed expanded cinema in the 1960s and 1970s). (Youngblood, 1970)

### **Is Cinema also Digital?**

In the present day, what we know of as Cinema has undergone a momentous decade-long transition, shifting both means of capture and delivery from analogue to digital technology, yet this has gone all but unnoticed by its mass audience. However, the gradual convergence of technologies of cinema and technologies of electronic imaging, finally arriving around 2011 into the viewing *dispositif* here under discussion, that of the cinema theatre itself, has led to concerns by cinema's specialists – filmmakers, theorists, archivists and enthusiasts - that the basic structure of Cinema has been too substantially altered for it still to *be* Cinema (Rodowick, 2007). Undoubtedly, these concerns regarding Cinema's ontology have implications for the

contemporary media landscape but they are perhaps most pertinent to the question of how we now experience those films created, in what we might retrospectively name, the analogue era.

What degree of truth is there in the idea that a film made in, for example, 1910 would be gratuitously misrepresented by presentation via a 2010 digital projector – this despite the fact that the digital copy (digitisation) may be of the best type with no apparent difference in image quality, as would follow with current film restoration practice? Would the different temporal resolution of analogue projection (actually theoretically inferior) make a difference not just to an entrained aesthetic experience but also at a more basic perceptual level? Does the removal of mechanical film technology and the splicing in of video technology, affect the other constituent parts of the *dispositif*, especially the physiological response and consequent perceptual and cognitive experience of the human subject? In order to work through some of these concerns, and in collaboration with neuroscientist colleagues, Stephen Hall and Edward Rhodes, we collected some data on brain activity (specifically area V1 of the visual cortex) of various volunteers while watching projections of early cinema content. A ten minute reel of four different clips (representing different genres of film) was presented across two different conditions, the first projected by a 1910s hand-cranked film projector and the second, a 2010s High Definition video projector, typical of the sort used to present archival film in modern exhibition contexts (Edmonds, 2016).

EEG recordings from three sensors in area V1 were taken along with luminance data from the projection screen which determined a flicker rate for each of the projectors – a variable 14-16hz for the hand-cranked projector with a single-bladed shutter and 120hz for the video projector with a single Digital Mirror Device chip and six bladed colour wheel. Would the intrinsic brain rhythms of the participants be affected or driven by the similar frequencies of the

film projector? What effect would the 120hz stimulus of the video projector create? Could the low frequencies of the film projector create a Steady State Visually Evoked Potential (SSVEP) (Herrmann, 2001) which would effectively synchronise the basic perception of the spectator with the technology? Such a link at the level of technology as opposed to a higher level cognitive interaction with the image content would suggest a basic framework to the early cinema *dispositif* which is not accommodated by the technically highly accomplished digital projection.

Observations made while collecting the data included the perhaps obvious realization that the projected film image is one of much greater complexity than the simple black and white stimuli normally used in psychophysical experiments which would be more likely to produce a SSVEP. Flicker is much more consciously perceptible in large bright areas of the image than in the dark areas though interestingly both visual cortex (from the V1 EEG recording) and photometer picked up the modulated light in the entirely black sequences of the film which linked the clips together, despite this being invisible to the evidently not so ‘naked eye’ of the experimenters.

### **Doing for the Ear what the Cinematograph does for the Eye (and Brain)**

Out of necessity the testing was conducted in a lab in which the non-portable EEG recording device was installed, although ideally it would have taken place in the space of a cinema theatre. Once recorded, however, the data was far more portable and it seemed fitting to take this record of cinema experience and ‘return’ it to the *dispositif* of the cinema. The question of how to present such data was suggested by another known absence: Nearly all the original participants had commented on the sound of the film projector, such that it seemed to be a very significant, yet unrecorded part of the test. By setting a sonification of the existing EEG data

with the sound of the projector mechanism, key elements of the *dispositif* could be drawn together and viscerally unified. The data of both the electrical activity of the brain and the screen luminance were sampled at a rate of 2048hz giving a very fine temporal grid against which to isolate brainwaves and light modulation operating at much lower levels. Interestingly though, the ear can discern much higher levels of auditory flicker, “above 1000 interruptions per second” (Miller, 1947), so how better to recast the data than in an ear-readable form. What can the ear tell us that the eye has missed?

A rationale for the sonification of the data was worked out collaboratively between Guy Edmonds and the sound artist, Shaun Lewin. The aim was to incorporate it with a hand-cranked projection of the film used during the data collection and present it as a live performance. It should afford an individually subjective interpretation of the data alongside other sonic, mechanical and visual elements of the *dispositif*, a *modus operandi* which allowed for a certain amount of processing to be applied to the raw data, as detailed in the following description.

A Max/MSP patch was used to ratchet the sound of the projector's shutter mechanism to the light modulated sonification of EEG recordings of 10 spectators, in a system analogous to the tuned drum found in player pianos. Each shutter event triggered the playback of 1 frame's duration of EEG data (defined as 62ms, equivalent to 136 datapoints within the EEG recordings) - these values were determined as an average 15 frames per second and derived from the results of the luminance data from the slightly variable-rate projections presented to the 10 subjects. Initial explorations in the sonification of the EEG recordings revealed that the simple transduction of a floating point data stream into 44.1KHz digital audio produced a soundwork that would place substantial demands upon an audience seated for the full duration of the film. Experimentation revealed that adding a second instance of the transduced EEG audio to itself

with a very short interval of time separating these instances created a resonant tone with some harmonic characteristics (a process often described as comb filtering). In order to differentiate between the 10 subjects' neural activity, a different interval of time was applied to each EEG datastream's comb filtering - these intervals were determined through exploration of the emergent soundwork and do not have a semiotic value beyond that of an arbitrary index of identities. The intensity of each comb filter is proportional to the quantity of darkness captured by a webcam facing the projector screen, in a negative emulation of the use of a photometer in the original test.

The production of multiple resonant tones with pronounced harmonic and inharmonic components, the complex syncopation of the EEG datastreams and the role of the audio within a larger multimedia piece all suggested a relationship with the use of a gamelan orchestra within an Indonesian shadow puppet theatre event. This relationship was rendered explicit through the use of audio processing that translates the frequencies produced by the comb filtering into their nearest equivalent within the 7 note Pelog scale (tuned to concert pitch).

The first performance of this Displaced *Dispositif* was given on 17 August 2017 during the Off The Lip colloquium. (See Figure 1.) Although not scientifically readable, and technically needing further development, the performance succeeded in establishing a symbolic link to the operation of brainwaves within the *dispositif*, such that those present may well have questioned their role as the *eleventh* spectator.

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The transferability of *dispositif* is the key to its usefulness as a concept. We can talk of *dispositifs* of early cinema, of amateur cinema, classical Hollywood cinema, avant garde cinema and indeed digital cinema and we know we are talking about the specific viewing conditions of a

specific type of cinema all of which differ from each other. (Parente & de Carvalho, 2008). For film archives and museums this ‘film as *dispositif*’ (Fossati, 2009) conception is part of modern collection policy which accepts the impossibility of replicating any one historical film moment in all its complexity and instead offers new *dispositifs* for old films by, for example, commissioning self-consciously new scores for silent films. This is already one level of displacement that our title alludes to but with this performance, we aim to displace elements within the *dispositif* into other modalities, to make them apparent and call them more powerfully into our conscious experience. Rather than a new score then, this performance invites the audience to listen to that most silent of film accompaniments, the brain activity of the spectator, while hopefully bringing its relation to the rhythmic propulsion of the film strip further into the realm of conscious perception. Notwithstanding the fact that every screening is to some extent a displacement of all previous ones, the performance takes a step further in displacing some of the contents of cinema’s black boxes and making hidden dimensions of the cinema experience more apparent, revealing the potential for ‘liveness’ in what might otherwise be taken for a uniform product: The show must go on!

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*Figure 1.* Guy Edmonds and Sean Lewin set up the equipment used for the performance of ‘The Displaced *Dispositif*’