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By Alan Smithee

By now I've come to intuit, in true *Silmarillion* style, that the universe came into being by way of song. [1] This is an elemental understanding of a reality which operates along paths of vibrations and sensations that give way to a melodic organisation orchestrated by our human society with all of its technologies, consciousnesses, and creative capacities. The universe and film share this debt to the vibratory nature of light and sound. Immateriality, surplus, and visualisation – orchestrations of empire both ascendant and past – swell and collapse through all of my senses. Most of the time I hardly know what's there. In a slender publication by filmmaker and scholar Sasha Litvintseva, I read that "the perception of movement is processed by its own physiological process called oscillopsia. Experiments have shown that this process operates in the same way when seeing movement in film as in a three-dimensional environment." [2]

In my mind, a story hovers above these considerations. It is a story that I think lends itself to helping make visible the logics and material velocity of our present moment. It is about a surprising intersection of technologies operating in two disparate fields, music and geology. Two software interfaces – DecisionSpace365 and AutoTune – share a common algorithm, inventor, and purpose: with sound as their information source, to render otherwise invisible realities visible to the human eye on screen. DecisionSpace365, originally known as Landmark Graphics, visualises the substrata of the earth for the purpose of oil extraction. AutoTune visualises and manipulates the human voice for the purpose of cultural production.

As a nonfiction filmmaker, I've found that the transformation of three-dimensional space into screenspace interacts isomorphically with my perception of the physical. In other words, reality and cinema co-create one another, in a gleeful and highly reactive relationship with memory. Encountering the story of these two softwares, combined with knowledge of the lifelong interdependence of film and oil, leads me to wonder how filmmaking itself might function as a research practice by which to interrogate the environs of affect produced by these visualisation softwares for the professional classes that interpret them. More specifically, I set out to make a film about seismic mapping and AutoTune in which data visualisation operates as a cycle of perception and reality for the filmmaker, the geologist, and the musician.

In the 2011 publication, *The Right to Look*, author Nicholas Mirzoeff understands "visuality" as a supplement which self-authorising authority requires to make itself seem self-evident. This is the visualisation of history. This is a visuality that creates surplus; it is an exclusive claim on the right to look. While Mirzoeff establishes multiple regimes of visualisation as having occurred since, he identifies the beginning of our now "permanent crises of visualisation" as the slave plantation in which, white slave owners were bequest the sovereign surrogacy to maintain a division of labour through their violently enforced surveillance of enslaved Africans. [3]

With this notion of visualisation in mind, allow me to tell the story about how these two technologies – DecisionSpace365 and AutoTune – came to be, how they are understood in their field-specific contexts, and, more precisely, as Barthes might have put it in his 1970

analysis of film semiotics and mythic language, how they participate in the imperial project of making the contingent appear natural within the language of empire. [4]

The Backstory

In 1998 AutoTune revealed itself to popular music audiences as a robotic shimmer in Cher's mega-hit single, "Believe". The pitch-correcting software works by predicting a singer's intended notes based on the existing vocal melody and then adjusting the actual notes accordingly. This manipulation results in "perfect pitch". In the case of what came to be known as "The Cher Effect", AutoTune was pushed beyond its original design. Instead of adjusting notes into the "correct pitch", the software switched between notes instantaneously, thereby creating that trademark mechanical intonation.

Inventor Andy Hildebrand cultivated the breakthrough approach to pitch correction over many years working in data processing for the oil and gas industry, first for ExxonMobile, and then for the startup that he helped to develop, Landmark Graphics. The latter produced a software that produces an image of the substrata of the earth from a process known as "seismic reflection" in which vibrations or soundwaves that bounce back from being shot into the earth's surface are recorded. Landmark Graphics could eliminate "noise" produced through this process and zero in on data of interest in a visual rendering akin to a three-dimensional digital map of the earth's substrata. Hildebrand left Landmark Graphics shortly before it was sold to US oil technology behemoth, Halliburton, in 1996 for $560 million and subsequently renamed DecisionSpace365. [5]

At the heart of the seismic workstation that is Landmark Graphics, lies the mathematical measuring stick known as "auto-correlation". Prior to Hildebrand's intervention, auto-correlation had been considered impractical in a music engineering setting because of the large amount of data processing it required. Returning to his lifelong interest in music, he took up the challenge and successfully rerouted the procedure such that a million multiply adds were reduced to just four. And voila! AutoTune was born, alongside the company, Antares Audio Technology, to sell it.

Speculation and hypotheses dangle from the story of Andy's inventions. The narrative behind AutoTune and DecisionSpace365 expresses the pasts and presents of cultural production and fossil fuel extraction as a complex set of imbricated factors that resist the assignation of any one location of creation. While this calls for further analysis regarding their connections to one another, as well as AutoTune as its own entity, I will focus for the remainder of this essay on implications for DecisionSpace365.

As the film and petroleum industries have, so to speak, grown up together, oil has always maintained a public screen-life. Since industrial oil's beginnings in the early 20th century, film has been central to every oil major's approach to cultivating public and staff perception of crude oil's materiality, extraction processes and usefulness. For example, Shell has operated an in-house film production unit since 1934, producing over 500 films for international distribution. While outsourcing production, BP released self-proclaimed "objective documentary films" through their own television channel, free distribution library and internal screening room until the mid-80's, receiving four Oscar nominations, seven

BAFTAs and the Oscar for Best Short Film for the 1960 Italian production, *Giuseppina,* which depicts a day in the life of the daughter of a BP gas station owner. [6]

Like the industry itself, this cultivation of perception has never been a static undertaking. The visualisation of oil, including and beyond documentary film, has evolved to meet the historic and material moments that have constituted "the era of oil" – representing it first as a naturally appearing, neutral energy source, then a necessary but unwieldy substance requiring modern infrastructure to tame, and finally a traceless enabler of commodified modernity. [7] DecisionSpace365 appeared during this most recent iteration, through which oil navigated the geopolitical upset caused by the late 1970s nationalisation of some of the world's highest producing regions in the Middle East – namely Iraq and Saudi Arabia. The ensuing decades entailed privately-owned Western companies scrambling to relocate large parts of their lease portfolios.

This process of expansion and relocation required the translation of new locations into commodity sites. For an Exploration and Production (E&P) staff geologist, understanding the complex matrix of rocks, minerals, elements, gases, oils, water, time, friction, pressure, chemical reactions, space and gravity that is earth, for the specific purpose of oil extraction, requires one to possess an appropriately honed and specialised perspective. A substrata map, as understood as the screen image of a specific section of the earth's crust produced from extensive data processing, is the mediation by which the earth can be seen *as* oil. However, what is shown on the screen of a substrata map rendering is not outlines of crude oil floating below the surface, but rather layers of rock density measured in sound and speed (Figures 1

and 2). The work of the geologist then is to interpret these acoustic variances alongside well data to assess the likelihood of a particular rock formation containing oil.

FIGURE 1—A 3D seismic cross section of Teapot Dome (NPR-3) showing the acoustic variance of subsurface rock formations up to approximately 12,000 feet of depth

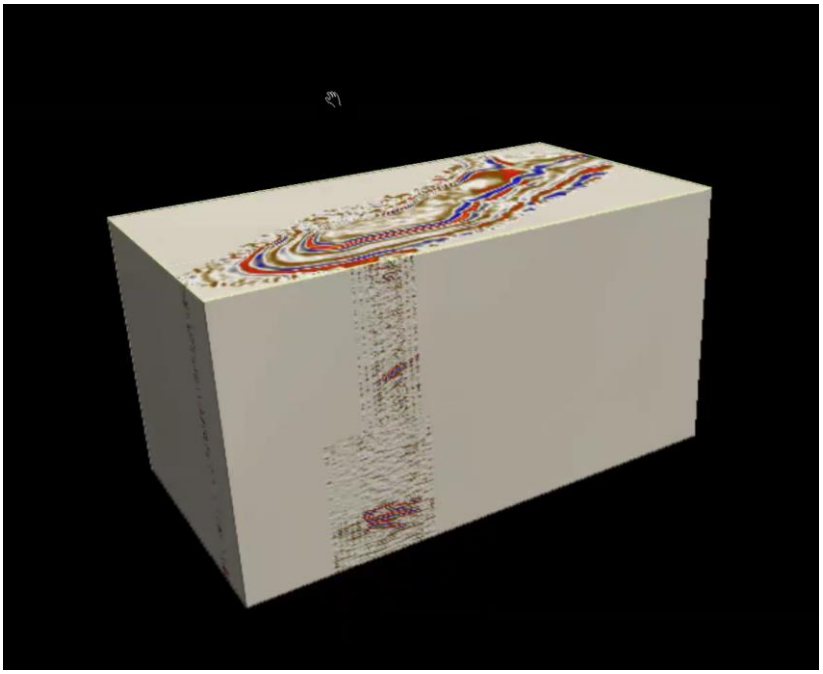

FIGURE 2—A wide view of the NPR-3 seismic map demonstrating the surface area scale. This covers an approximately 124 square kilometre surface area

In our present, it is strategic for powers of production to render themselves invisible and materially unthreatening. Seen across social, technological, and architectural worlds – through apparatus like the Cloud, the "ultra-clear" high rise city, social media, and The Glass Age – this articulation of transparency between those in and out of power no longer mimics a one-way mirror, but the window on the top floor looking out for miles. Those out of power are the objects surveilled. Further, they are excluded from the ways of seeing that are enabled by the material structures extending and transforming the perspective of those with a view, even while the material itself appears see-through.

Seismic mapping exemplifies this aesthetic shift towards the immaterial as, by a Marxian logic, might be expected during the concurrent transition from industry intensive capital towards fictitious capital. Speed and movement facilitate value ahead of attachment to material commodity or even to labour. The perspective of the underground, indivisible from its onscreen visualisation, is the access point by which financiers attach value to land based on speculation. To interrogate the technology-speculation-value feedback loop, scholars in the energy humanities have argued for the application of energy-centric frameworks to reveal forms of power that have enabled and influenced historical chapters in previously underappreciated ways. [8] In our case, this interrogation brings us back to how particular softwares have dictated not just what parts of the earth we can see or how it is represented visually, but how we think about the earth beyond its screen image.

The Movie

Accordingly, I pick up the camera here in Andy's narrative: at the human encounter with that unseeable terrain – the underground. I shoot footage at the historic Teapot Dome oil field

(now privately owned by Green Reserve Energy) with a former Exxon geoscientist who explains, in laymen's terms, how one would have come here in 1915 and evaluated, by eye, how likely it would have been to strike oil. We later look together at a 3D rendering of the subsurface of this same land area and compare this to our experience of speculating on the ground. I recorded footage of oil fields, pump jacks, abandoned company towns, oil museums, gas stations and car rides right alongside screen recordings of seismic 3D cubes, topographic maps, geological maps, raw datasets and Google Earth satellite maps of the same locations.

It's worth briefly mentioning how the Teapot Dome oil field became the location for this study. In the US, where oil production is a privatized affair, the data gathered to map the substrata of the earth is expensive to create, highly valuable, proprietary in the private sector and, therefore, virtually impossible for unauthorized personnel to access (especially experimental filmmakers). Teapot Dome, formerly Naval Petroleum Reserve No. 3 (NPR-3), is essentially the only publicly available substrata dataset in the onshore United States. This dataset is necessary to create the 3D substrata maps I would be working with. Teapot Dome was designated during the Taft Administration to be a petroleum reserve for the US Navy with the Department of the Interior. As a publicly owned asset, the datasets entered into the public domain and have since been used for scientific, educational, and experimental purposes. [9]

Finding its way into public ownership and private production was a national scandal of its own during the Harding Administration, which led to the first imprisonment of a sitting US cabinet member on multiple accounts of bribery and corruption. That's a story for another

time, but, for my purposes, I will note that oil independent Edward Doheney, on whom Upton Sinclair's classic novel *Oil!* and subsequently Paul Thomas Anderson's film *There Will Be Blood* are based, was a main actor in this affair. If you are familiar with either of these works of art, you might notice how the focus shifts from labour politics – and long passages of the technical, mildly eroticised extraction processes in early 20th century *Oil!* – to a more-or-less personal feud in the early 21st century screen adaptation.

With this experience and footage secured, I'm reminded of Antares Audio Technology's slogan: "Where the future is still what it used to be". Nineteen hours of footage, shot in eastern Wyoming, sits transcoded and synced in an Avid project on my computer, ready to edit. But the film of my mind's eye does not yet exist. There is little action taking place in this footage; it has all already happened. The pump jacks move methodically, up and down, across the field. Right now, none of them are broken. Some will be dressed up like reindeer around Christmas, a token of pride and appreciation bestowed by local townspeople. No further layers of imagery, no enhancing of the visual experience, will be added to the film.

FIGURE 3—Wide shot from the south west quadrant of the Teapot Dome oil field

My best guess is that it will be sound that must be run, like a blade, between the thin layers of meaning that make up the screen image in my film in order to make the data, the augmented, and the virtual appear contingent. But how to make it sound like power? How might the screen betray its commodity heritage? We must feel the peripheral allowing the system – the exploration of the world and its many layers of time – to seep in. To "walk so silently that the bottoms of your feet become ears," as composer Pauline Oliveros commands in her guide to Deep Listening. [10] This is the work of defocusing, in both sound and vision. Musician David Grubbs later interprets working with Oliveros's compositions as "music out of the corner of one's eye". [11]

The act(s) of creating an oil field is a phenomenal metabolisation of time; speed itself a phenomenal weapon of visualisation. No sooner have we seen the substrata, converted the voice (itself once an endowed form of collective memory) into a prediction, than we have orchestrated new sites of history. A memory without a past is made legible through the visualisation of non-human histories traded in oil futures. According to the Brent Index, crude oil prices are predicted to decline in 2025 due to overproduction and underconsumption. Major corporate actors define both the parameters and destination of global energy production's next chapter even as their existing work jeopardises everyone else's ability to speculate about what any futures can be. [12] Energy dictates global visualisation practices. It permits the density and scope of human futures. It harnesses the narrative, dictates how far, how deep, and film has always participated in this.

To interrogate the vestiges of this era of visualisation, my project will invest in another politic of sensing that, as Oliveros suggests, privileges listening as an equally productive act

to that of making sound. While forwarding the physiological act of hearing, this listening is inclusive of the act of exchange present when one necessarily is a contributor to the utilisation of sound as force shaping a sense of place. How that will interact as an attempt in making apparent an imperial message? Ultimately, we'll just have to listen and see.

Notes

1. The article title quotes an interview with Jean-Marie Straub in which he thusly describes the approach of Italian painter Giotto, who laid the foundation for cubism in his mountain paintings during the late Middle Ages. Jean-Marie Straub and Daniele Huillet, "Something That Burns Within The Shot" (Interviewed by *Cahiers du Cinema*, October 1984, kinoslang.blogspot.com/2011/06/something-that-burns-within-shot.html.)
2. Sasha O. Litvintseva, *Geological Filmmaking* (London: Open Humanities Press, 2022), 25.
3. Nicholas Mirzoeff, "The Right to Look," *Critical Inquiry* 37, no. 3 (2011): 473. https://doi.org/10.1086/659354.
4. Roland Barthes, *Mythologies*, trans. Johnathan Cape (New York: The Noonday Press, 1957), 146–152.
5. Allen Myerson, "Halliburton Will Acquire Landmark Graphics in Stock Swap," *New York Times* (July 2, 1996): https://www.nytimes.com/1996/07/02/business/halliburton-will-acquire-landmark-graphics-in-stock-swap.html.
6. Available to watch at the BP Video Library, https://www.bpvideolibrary.com/record/466.

7. Laura Hindelang, "Oil Media: Changing Portraits of Petroleum in Visual Culture between the US, Kuwait, and Switzerland," *Centaurus* 63, no. 4 (2021): 675–94. https://doi.org/10.1111/1600-0498.12418.

8. Jussi Parika, *A Geology of Media* (Minneapolis: University of Minnesota Press, 2015); Brian Jacobsen, *The Cinema of Extractions: Film Materials and Their Forms* (New York: Columbia University Press, 2025); Jordan B. Kinder, Lucie Stepanik, "Oil and Media, Oil as Media: Mediating Petrocultures Then and Now," *MediaTropes* 7, no. 2 (2020).

9. Available to download at https://wiki.seg.org/wiki/Open_data#Teapot_dome_3D_survey.

10. Pauline Oliveros, "Sonic Meditations," *Smith Publications American Music*, 1971.

11. David Grubbs, "Pauline Oliveros: Music out of the Corner of One's Eye," *E-Flux Journal*, 2025. https://www.e-flux.com/journal/154/668774/pauline-oliveros-music-out-of-the-corner-of-one-s-eye/.

12. Peter Hitchcock, "Everything's Gone Green: The Environment of BP's Narrative," *Imaginations* 3, no. 2 (2012): 104-114. http://dx.doi.org/10.17742/IMAGE.sightoil.3-2.7.

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Filmography

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There Will Be Blood. Directed by Paul Thomas Anderson. USA; Paramount Vantage, 2007.

Biography

Alan Smithee is a filmmaker, documentary editor, curator, and farm worker living in New York. Their film practice is centred on intersections of technology, power, geology, and having fun.