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Unburning: Technics of Opacity, Oversight, and the Police Surveillance State

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ABSTRACT

The subject of this paper is a collection of 18½ hours of FBI aerial surveillance video documenting the Baltimore Uprising of 2015. Working from the premise that the video footage reproduces a criminalizing and racialized gaze, my analysis centers on what remains in the media if the video is absent (or abstracted): video metadata embedded within the media's ".mp4" container during its redaction, but also "burned" onto the video image by the infrared sensor that captured it.

Even as it works to decode what these documents "speak" about the anti-Black apparatus that produced them, this paper argues beyond a forensic reading, through the lens of expertise: metadata is more than a tool for establishing evidentiary authenticity; it is also a site for creative intervention and contestation.

INITIAL CONDITIONS

On the night of April 12, 2015, Freddie Gray made eye contact with two patrolling police officers near the Gilmore Homes housing project in West Baltimore. Arrested for carrying a knife that Maryland state's attorneys later determined to be legal, Gray was put in a police van where he received injuries to his neck that, after a week of hospitalization, led to his death. After Gray's death, the community organized protests on the streets of Baltimore. Margaret Rorison's short film *One Document for Hope* captures a view of the mourning, celebration, rage, and solidarity in those streets.[1] The camera looks over the protesters as members of the Baltimore Police and National Guard gather behind barricades; it also looks up at circling helicopters set to a soundtrack captured from police scanners. This sousveillant perspective (looking up and looking back) is important to occupy and (re)present. But there is also unfinished business up in the air: during the Uprising, the extent and scope of FBI aerial surveillance of Black Lives Matter protests was not yet understood.

At 8:59 p.m. local time on May 2, 2015, a motor attached to an infrared sensor mounted to a Cessna Citation V (twin-jet) airplane failed.[2] The video image it was capturing shook briefly, horizontally, then panned up towards the sky before breaking into a pattern of light and noisy dither (visual noise added as part of image compression). It then began a calibration cycle before resuming its surveillance. The airplane bore the FAA registration code N557PG. These details, such as the date

***Figure 1**. A still from 1D5001.mp4, a video from the FBI's published collection "Protests in Baltimore, Maryland, 2015", taken at 10m59s*

and time, and the make, model, and tail code of the plane, are drawn from a collection of videos released by the FBI in response to ACLU Freedom of Information Act (FOIA) requests more than a year after the Baltimore Uprising. This information is present in two separate layers of metadata attached to media in this collection of aerial surveillance.[3] The first, burned into each frame of video, contains partially redacted data from the infrared sensor installed beneath N557PG. The second is a collection of XMP metadata produced by Adobe Premiere during a process the FBI used to prepare the videos for public release and (likely) unwittingly included when these materials were published on the FBI's File Vault website. These layers of media illustrate the contradictory valences of legibility and intelligibility in surveillance media: the asymmetries of who and what are accessible to whom.

This paper traces a series of positions, technical and conceptual engagements, questions, assumptions, reductions, exaggerations, and collaborations held throughout the process of research and artmaking that I have developed under the broader title of *Unburning* (or sometimes, ~~*Un*~~*burning*) that attempt to make (and break) sense this collection of surveillance video. While operating at a distance (if not the 6,000+ feet of altitude these aircraft often circle at, then the distance of both mediatic and positional abstraction) from the death of Freddie Gray, I'd like to acknowledge the layers of injustice at work here: the police brutality that resulted in Gray's death produced the conditions of the Uprising while also reproducing violent subjugation against protesters.

Unburning is part of an ongoing suite of web-based work I have developed under the title *Oversight Machines*. These are web-based artworks that operate on government-produced materials in different ways, analyzing and transforming the underlying subject matter. I make this work inefficient in several ways, slowing the process to make aspects of sense-making apparent as they are happening. While more focused on process than results, each "machine" produces and publishes findings in the form of visual media, as well as repurposing and extending metadata found in the source materials. This material is released to the public domain. A more detailed description of *Unburning* follows later in the article.

THE TWEETS, THE FLEET, THE COLLECTION

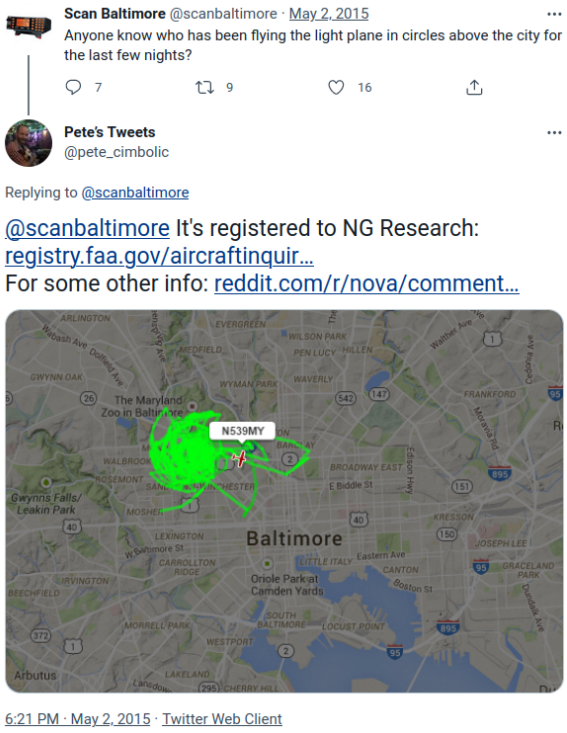

Figure 2. Screenshot of tweets by plane spotters identifying planes circling Baltimore.

The *Washington Post* first reported the presence of surveillance planes over the protests on May 5.[4] This reporting was based on a series of tweets. The first came from Brendan Shayne on an account associated with his website Scan Baltimore, whose stated purpose was to "stream live Baltimore City Police Department (BPD) radio transmissions for all to hear."[5] Shayne's query read, "Anyone know who has been flying the light plane in circles above the city for the last few nights?"[6] This tweet was answered seven minutes later by Peter Cimbolic with an image of the plane's flight path (a map of Baltimore overlaid with an intense neon green scribble from the plane circling over roughly the same path) and the message, "It's registered to NG Research" followed by links to the plane's info on the FAA website and a link to a reddit thread from July 2014 in which users identified the same planes circling over northern Virginia.[7] Cimbolic then contacted the ACLU about the likelihood of government surveillance of the Uprising.[8]

The flight map of the plane was produced with the help of Software Defined Radios (SDRs). These small, inexpensive USB sticks convert radio signals into data streams that can be analyzed using software; in this case they were used to monitor Automatic Dependent Surveillance–Broadcast (ADS-B) radio signals emitted by the planes at 1090MHz (and in some cases 978Mhz), signals which are mandated by the FAA. These broadcasts carry the FAA registration code of the plane, its GPS location, altitude, ground speed, and other data, updating each second. Hobbyists pick up these signals locally and stream the data to services like Flightradar24, FlightAware (now owned by defense contractor Raytheon), and ADSB-exchange; these sites crowdsource the signals and

allow users access to worldwide data about which plane is where in the present, as well as access to historical data (for a price).

Following the initial *Washington Post* reports, independent researcher John Wiseman and journalist Sam Richards separately revealed a larger fleet of FBI surveillance planes (Wiseman has since developed "Circular Advisory," a set of twitter bots that automatically identify circling airplanes over US cities).[9] Following these discoveries, the Associated Press published its own report on June 2, 2015, tying at least 50 aircraft to more than a dozen fake companies with names such as FVX Research, KQM Aviation, NBR Aviation, PXW Services, and NG Research. The ACLU filed FOIA requests for footage and further information about the program. On August 8, 2016, in response to the ACLU request, the FBI posted the collection of partially redacted videos to the FBI File Vault, a curated web archive of FBI media that contains mostly scanned paper documents pertaining to famous or infamous figures (e.g., Frank Sinatra and Abbie Hoffman). At the time of its posting, the collection, titled *Protests in Baltimore, Maryland 2015, Aerial Surveillance Footage*, was only one of three sets of videographic media posted to the Vault.[10]

On October 30, 2016, a week before the US general election, the FBI File Vault twitter bot tweeted the existence of the collection, writing "Protests in Baltimore, Maryland, 2015: Documents and video related to protests in Baltimore, Maryland, beginning … [sic]".[11] I read the tweet that day and immediately felt interpellated by it—addressed as a potential audience for the footage. The work of making this footage publicly accessible, followed by the further step of publicizing it, articulates a public (as an audience) and a way of seeing. This call to witness might also be understood as a call towards whiteness, to reinforce a racialized and criminalizing point of view, to engage in oversight. Citizen (or civilian) oversight is often invoked in relation to government transparency, to imply access to government materials (such as this footage and its associated documents), but I use the word here to invoke a set of techniques that reorient and reorder land and bodies that Mirzoeff locates spatially within the work of "overseeing" (as in the work of an overseer) during the plantocracy.[12] I am also deploying oversight in its other denotation—the failure to notice, the blunder of not seeing—as a way to draw attention to what these techniques fail to capture. This aerial surveillance video, as is, cannot provide an identification with the acts of social solidarity, mourning, fear, and rage happening on the ground. As a simulacrum, it signifies a world in which those things have already been erased.[13] The Wescam MX-20 forward-looking infrared sensor (FLIR) attached to N557PG captures heat and light, reducing bodies into amorphous shapes. Daniel Grinberg describes the visual work of the sensor: "Through the restrictive optic of this lens, they are both unwillingly registering their precarious humanity and being dehumanized."[14] In his analysis of the Baltimore footage, Grinberg ultimately determines that this footage reproduces a dehumanizing and criminalizing gaze.[15]

Ways of seeing can also function as an induction into force. Tongo Eisen-Martin describes "[the] modern era with hyper militarization of police, mass internment of Brown and Black people, permanent imperialist invasions around the world" as one in which whiteness functions, "not as a privilege, but rather a deputization."[16] Eisen-Martin describes this deputization in terms of a standing army in which not every foot soldier is literally sworn in; it is through more subtle forms of identification that militarized policing is reproduced. Christina Sharpe describes the work of images that depict Black distress and suffering as, "function[ing] as a hail to the non-Black person in the Althusserian sense. That is, these images work to confirm the status, location, and already held opinions within dominant ideology about those exhibitions of spectacular Black bodies whose

meanings then remain unchanged."[17] After reading the tweet announcing the release of the footage I felt reflexively aware of my whiteness, my positional distance from the scene of the Uprising, and also my complicity in the way that democracy distributes (and dissipates) responsibility for its abuses of citizens, subjects, and targets.

If these video images are ethically irretrievable, what else remains in these media and how might what remains be repurposed against this apparatus of subjection? In addition to the visual information it captures, the sensor also reports internal diagnostics and settings derived from its LIDAR ranging technologies, as well as data feeds from the plane itself. Sharpe also addresses the role of metadata in relation to the images they extend:

> As photographs of Black people circulate [...] they are often accompanied by some sort of note or other metadata, whether that notation is in the photograph itself or as a response to a dehumanizing photograph, in order that the image might travel with supplemental information that marks injury and, then, more than injury. (Christina Elizabeth Sharpe, *In the Wake: On Blackness and Being*. [Durham: Duke University Press, 2016], 84)

Sharpe characterizes the annotative effects of metadata as an additional subjectifying inscription. But metadata, on occasion, is less about adding details of the conditions of an image, than about capturing the conditions of documentation. Because metadata accrues (sometimes overwriting itself) at each stage of operation (transcoding, redacting, publishing), it is a technology that can also tell on itself and its contexts: sometimes more of a mirror than a lens.

DATA, RAW OR BURNED

***Figure 3**. Early prototype of* **Unburning**, *reading text from sensor overlays*

To extend the vertical logic of surveillance to the aesthetic, we might conclude that this video was released to enunciate who is on top. But what's on top of what's on top? In what we might call the "stacking order" of the relationship between text and image in these videos, sensor metadata is above the optoelectronic and infrared images. But this aboveness is constructed. Functionally, the data text is burned-in: its pixels have replaced the pixels of what is underneath. Burning-in, like timecode inscribed onto a working film print, or watermarks into stock photos, describes the destructive superimposition of one image onto another. This process is destructive in two senses: in the first sense that the video file has been rendered flat, by the imposition of an image that erases another; and in the second sense that data have been transformed into an image. Burning-in produces an inseparability, indelibly joining the action on the ground with the full suite of measurements above: coordinates, camera settings, LIDAR targeting information, and slant range. The redaction zones, which inexplicably pulse to match the color of the center pixel of the underlying video, are also locked into time in this way.

An image of data is not data. Geoffrey Bowker warns us that "raw data is an oxymoron and a bad idea; to the contrary, data should be cooked with care."[18] But what is burned data? Like the transformation of a searchable document into an image of text, this is not an act of redaction (although it occurs alongside redactions) so much as a reduction: the data text is legible to a viewer, but not sortable or queryable in the way that computable data is. While reduction (of resolution, affordance, and access) is built into many technical workflows as both feature and accident, it is sometimes unclear whether these opacities are accidental or malicious.

When confronted by this gap of computability presented by burned-in data, my first response was to attempt to close it: to find a way to read the data from the screen; to reconstruct a layer of information that had become an image. I had already developed a project that uses optical character recognition (OCR) as a driving technology in the work (see Abram Stern, "Operational Character Rendition" or *Two Questions for Gina Cheri Haspel*), and that code was at hand when confronted with this footage.[19]

The first implementation of *Unburning* used OCR to read the burned-in textual portions of the video; if "burning" meant the process of data becoming an image, I conceptualized unburning as a way of reconstructing the data, first by reading it as text. I identified the portions of the video image with onscreen text by hand, noting the pixel coordinates and dimensions. The project loads the surveillance footage in an offscreen HTML5 video element, copying only the portions where text has been found into a visible canvas element, a special kind of image in which pixel data can be read and written programmatically using JavaScript. In turn, the canvas image data can be passed to Tesseract, an open source OCR tool. Having been unable to find documentation for the sensors, apart from instructions for installing one into a specially modified Cessna, I was left to guess at property names for the different data positions. The mode, exposure, and time were straightforward. Others are still not obvious. I repurposed the areas of the screen that had been marked for redaction as a space or display of what was read. This process of reading each video frame (1/30th of a second) as a real-time loop multiplied the 18½ hours into a challengingly durational 600-hour project. I had imagined this as something that could run during an exhibition over the course of a month, at which point I could publish the findings.

This initial prototype was dissatisfying and I ultimately set it aside. It didn't work very well. It read only the portions of the screen I told it to read. Different sensor modes seem to operate at different resolutions, which reorders and repositions these data elements on the screen. There are at least four different sensor models used across the multiple aircraft involved in collecting this footage. The fixed data-text locations I'd carefully mapped out were not universal across the collection, and sometimes not even consistent within a single video file. Some of the overlays are so faint they couldn't be read with OCR.

In undertaking this work, I was following a logic of actionability: that the information produced by the sensors, but illegibly withheld, was useful.[20] The office of the Director of National Intelligence's definition of "actionable" is

> 1. Information that is directly useful to customers for immediate exploitation without requiring the full intelligence production process; actionable information may address strategic or tactical needs, support of U.S. negotiating teams, or actions dealing with such matters as international terrorism or narcotics.
> 2. Intelligence and information with sufficient specificity and detail that explicit responses based on that information can be implemented.(Corin Stone, ed., "U.S. National Intelligence: An Overview 2013" [McLean, VA: Office of the Director of National Intelligence, 2013]

I had worked under the assumption that there was something of value to be found and extracted: a needle in this haystack of sensor data points. Mols Sauter has proposed that secret information, once made public (whether by leaks, hacks, FOIA work, or other forms of information activism), carries an illicit aura.[21] This aura imbues information with a sense of importance rooted in the "assumption that the database in question was purposefully concealed from the public and required liberating." The illicit aura repels expert interpretation and contextualization, and encourages a hermeneutics rooted in direct public engagement with ostensibly raw information that is "cast as a resource to be mined for proof of the violations the illicit aura assumes are already there."[22] The hermeneutics encouraged by illicit auras posit correct reading as a smoking gun, a heroic researcher slowly connecting the dots—the stuff of police procedurals.

This initial approach also felt uncomfortably solutionist. Technological solutionism reduces and abstracts structural problems into containable puzzles to be solved with the technician's favorite tools; quantification and abstraction can enclose a problem from its many contexts and associations. But abstraction can serve other purposes: as part of a gesture, it can resurface and enunciate historical and institutional resonances and open interpretation to other possibilities.

Caren Kaplan notes that aerial photography is rooted in instrumental realism, writing that "the reconnaissance image is purely military, intended only for technical or 'instrumental' purposes."[23] Instrumental suggests two things here: the ways that technological instruments determine mediatic conditions, and also that media itself is instrumentalized and put to work. Kaplan finishes her thought by explaining that the "hermeneutic loop of the aerial reconnaissance photograph can only be 'opened' through a critical historization of the emergence of the components of the image; its many elements of production as well as interpretation."[24] Kaplan is proposing a project where accounting for historical specificity is insufficient; these images' power of signification must also be accounted for to resist the instruments' disposition to be decoded as authoritative facts. At their moment of capture, the images were instrumental; the FBI stated that their aerial surveillance was

"used to assist in providing high-altitude observation of potential criminal activity to enable rapid response by police officers on the ground."[25] I read the FBI's decision to post the videos publicly as consistent with instrumentality. Publishing them opens up the likelihood of reactionary mediatization (operationally providing material for news media to rebroadcast, reproducing that gaze from above). This public availability also provides opportunities for critical historicization, which necessarily precedes the work of defamiliarization and rupture I am attempting here. Absent this important step of "breaking the hermeneutic loop," art that addresses historical trauma at best falls flat, and at worst reproduces the systems it means to critique, inflicting harm in the process.[26]

METADATA: ADDING INTELLIGENCE TO MEDIA

When media is produced, whether with consumer devices like smartphones or specialized surveillance gear, metadata is often produced as well. When videos are uploaded to Vimeo, YouTube, or other large media hosting sites, those sites strip metadata as part of their media preparation process. But because the video files from the FBI collection were hosted directly on the Records Vault server, metadata from the redaction process was, perhaps unwittingly, made publicly accessible as well. Adobe Premiere uses a metadata standard developed by Adobe called XMP (eXtensible Metadata Platform), which is now governed as a specification by the International Organization for Standardization (ISO 16684-1:2019).

Adobe programs embed XMP in the files they create partly for interoperability, storing application and document settings alongside media. Some, but not all the Baltimore Uprising videos contain significant quantities of XMP embedded in the MP4 file container. Unlike the burned-in data, this functions as data that is mostly beyond visual representation; its presence isn't announced, you must look for it with specialized tools.[27] This metadata makes clear that it is not data from the act of surveillance, but rather from the redaction of that material. Time stamps indicate, with minute granularity, that these files were created more than a year after the Uprising, in June and July of 2016. Temporal metadata is detailed, but perplexing. According to its file metadata (non-XMP data embedded by most filesystems), the file containing the video of the gimbal motor failure was last modified on July 25, 2016 at 4:47:52 p.m. with no time zone included (although burned-in data indicated UTC+1). The file's MediaCreateDate and MediaModifyDate (non-XMP media metadata defined by Apple's MP4 container format) are identical: June 3, 2016 at 4:25:46 p.m. with no time zone. XMP stores even more timestamps, with a creation date that matches the MP4 creation and modification dates (while including a UTC-4 time zone), while XMP's media modification date is twelve seconds later. XMP metadata also stores a set of actions taken in the project, tracked here as "saved, created, saved, saved," each of which is given a long instanceID of hexadecimal code. Each of these actions also has a timestamp, ranging from June 3, 2016 at 12:15:22 p.m. to 12:25:58. Even more dates and times accrue, placing project pantry creation, modification, and metadata at different times on May 18, 2016. Some of these dates align, others do not. They are claims made from different layers of software abstraction.

Beyond dates and times, the metadata also indicates that this project was produced using Premiere Pro CC 2014 for Macintosh. Despite being created on a Macintosh, the file contains a property called WindowsAtomUncProjectPath whose value is "\\\\?\\C:\\Users\\User\\Desktop\\Tim Project\\Baltimore Riots fix\\1D5-001.prproj."[28] It is unlikely that Tim is the name of the project, because another file in the collection, created on Premiere Pro CC 2015 for Windows, has "\\\\?\\C:\\Users\\rmduser\\Desktop\\Meredith Project\\Baltimore\\1D3\\1328241-1D3-

001_2.prproj" in the same property. The difference in operating system, versions of Premiere, and file paths reveal banal details of the conditions in which these redactions were performed. Like any semiotic system, difference is a key site of meaning. Different versions of the same program will include different properties. Some properties are determined by the operating system, others by the program. Others are set in the document. The presence or absence of a property, regardless of its value, can also be meaningful.

The file's metadata includes a property for "pantryIngredientsFilePath," which stores the path of the two files imported into the Premiere project: "b7E (white).png, N557PG-2015-04-30-015826.ts."[29] Starting with the latter: this filename—and procedurally generated filenames function as a form of metadata—includes the FAA registration number for the plane and a timestamp that corresponds to the original recording in local time (approximately 1:58 a.m.). In addition to the video file marked with the plane's identifier, this first file is an image of text burned-in to the screen; b7E refers to the Freedom of Information Act, providing exemptions for information that "would disclose techniques and procedures for law enforcement investigations or prosecutions, or would disclose guidelines for law enforcement investigations or prosecutions if such disclosure could reasonably be expected to risk circumvention of the law."[30]

It is hard to imagine that an agency with such an extensive record of malicious noncompliance with FOIA would wittingly include such depth of information about and beyond the process of redaction as part of that redaction.[31] Lawrence Abu Hamdan has suggested that sound can be leaky, and that "[t]he relational, leaky qualities of the sounds under scrutiny threaten their objectivity."[32] Metadata, too, is prone to leakiness; it is often appended to files without announcement and one has to look for it to know that it is there. Metadata's relationality is more associational: its values and parameters point to specifications and standards and into other databases. The value of an XMP property leads to a document that defines its spec. An FAA registration code found in a filename leads to registration data, like N557PG's ownership by National Aircraft Leasing Corp, a company used as a front for the FBI and other agencies.[33] It also leads to flight plans on ADSB exchange: among its many other flights, N557PG flew again on June 1, 2020, circling over the uprising in Washington, DC a week after the murder of George Floyd.[34]

Planes have an enormous paper trail and data footprint. A 456-page collection of FAA documents traces the story of this aircraft, beginning with a 2002 application by Cessna for an Experimental Certificate of Airworthiness for the plane with serial number 560-0557, which was then known as N221CE, and copies of the approved certificate. In 2003, the plane was reregistered as N557PG. Documents record, in minute detail, the replacements and upgrades of sensor apparatuses, no fewer than three times between 2006 and 2012. The FAA document accounts for and records the model number of every part number of each upgraded, repaired, or replaced part including hoses, cords, bolts, and sensors.[35] On September 1, 2021, the plane—still equipped with its Mx20 HD sensor—was listed for auction by the US General Services Administration. The winning bid was $1,249,000.[36] As of this writing, the plane was last flown in Colorado in July 2022, its new owner's registration still pending, its status "in question."[37] As I followed the lines of associations found in the metadata, material accrued. Properties, values, and associated media piled up. Guided by their illicit aura and a pleasure of noticing, I noticed patterns, repetitions, and absences in what felt like a concrete set of facts about the world. But this mode of reading masks the complex orchestration of software, hardware, and the human work of administration that is necessarily involved in producing metadata and its truth claims.

POOR IMAGE BUFFERS AND BAD ALGORITHMS

***Figure 4*. DISARM DISARM, *a finding image produced by* Unburning**

Figure 4 is among the image findings from the next phase of *Unburning* I developed. Rather than attempting to extract images of data from predetermined portions of the screen and reconstitute them as temporal metadata, this version utilizes a computationally crude frame buffer to locate and separate burned-in text from frames of video captured by the sensor. Frame buffers store a series of discrete images in memory and are integral to screen-based display systems. Writing about earlier implementations that made some of the first screen-based moving graphics possible, Jacob Gaboury describes frame buffers as "reveal[ing] a material connection between image and memory in digital systems, offering new insights into the temporality of computation as a visually mediated practice."[38]

Buffering images allows for comparison between and among what is held in the buffer; Unburning subtracts the encoded values of red, blue, and green brightness (each expressed as an 8-bit "word" or octet, a number between 0 and 255) of one frame from the next to determine the difference between them.[39] The algorithm measures, at a pixel level, how much has changed over time. But it has a short memory. With footage produced by a circling plane, the video is in constant motion. The burned-in text is largely static, with text changing at the scale of individual symbols, but occupying the same space in each frame. Within the formal aesthetics of these surveillance videos, pixels that don't change over time are likely to be burned-in; the pixels that move are likely to be the underlying video and this subtractive "differencing" process provides a map of change over time. This differencing process is commonly used in image-based motion detection, such as in home surveillance systems, where difference is a signifier of movement and presence.[40]

Unburning operates in a browser window, loading a video from the FBI collection off screen. When loaded, it determines some internal settings to use for its analysis (how many frames to use in its buffer, the time interval that sets the duration between frames, and the brightness threshold that determines what constitutes stillness and motion). These settings are relational; the longer the duration, the higher the likelihood that visual changes occurred within that time span. *Unburning* sets the alpha (transparency) value of pixels that have changed over a threshold value to transparent, those that are sufficiently static (ostensibly text) remain opaque, with those in between becoming translucent based on their proximity to the threshold. There is also code that takes into account that the brightest pixels on the screen—in most cases the whitest pixels—are generally data text (although some sensors use green text overlays, such as in fig. 1). The result of these operations (differencing and thresholding) is not a perfect separation between overlay and video; the video image is more "masked up" than erased; abstracted to the point where figures blend together, and—given the temporal compression of higher interval durations—the circular flight plans of the planes inscribe themselves into the media as large whorls (as in fig. 4, *DISARM DISARM*). As these images are produced, they are transferred back to the server where new metadata is embedded in them. This metadata reflects settings and conditions of their creation (source files, the threshold values), as well as some additional poetic gestures: a release to the public domain, white balance set as Unknown (b7e);[41] image region role identifier set to "abstraction against deputization"; GPS coordinates set to the FBI Records Management Division headquarters in Winchester, Virginia; and GPS altitude set to 1,312 meters above sea level. The generated images appear in a publicly accessible directory.[42]

This work operates in the spirit of, even if not following to the letter, what Matthew Fuller calls critical software. For Fuller, this functions either as "an arrangement of objects, protocols, statements, dynamics, and sequences of interaction that allow its condition of truth to be self-evident," or "software that runs just like a normal application ... twisted to reveal the underlying construction of the user, the way the program treats data, and the transduction of coding processes of the interface."[43] This is a process of obscuring the images below, not by covering them up (as in redaction) but by making them transparent, while enunciating (but not isolating) the onscreen data by maintaining its opacity (as visibility).

In this sense, *Unburning* also operates in terms of what Rebecca Uliasz has dubbed "bad algorithms." A bad algorithm "(1) subverts the original intention, and (2) improperly uses the system to its own unexpected results."[44] Uliasz coined the term to describe her *DOT Cam* project in 2017. *DOT Cam* is an algorithm that runs on the NY Department of Transportation live surveillance video feeds, identifying cars and erasing them from the footage. In both *DOT Cam* and *Unburning*, interface and user interaction are absent, favoring redaction (or perhaps reduction) over revelation. *Unburning* is inefficient, working visibly over duration in the networked space of a browser rather than invisibly on a command line—it performs in terms of enacting a process, but isn't performant. By highlighting their own limitations, bad algorithms resist the tendency of critical software to engage in what Federica Frabetti has referred to as "the mystification of immediacy, or the mystification of demystification."[45] These mystifications occur when critical software's attempts to "make the social apparent" by subjecting the software in question to a kind of transparency (i.e., to show its inner workings) that the critical intervention itself is not subject to.[46]

~~UN~~BURNING

Figure 5*. ~~Un~~burning *image

Since 2019, performing artist Margaret Laurena Kemp and I have been working on a collaboration and dialogue in media that combines video documentation from Kemp's durational performance at the Montalvo Art Center in 2016 with the work I have described above. Kemp's performance, which spanned five hours split between an outdoor and interior space, the latter of which contained a large pile of soil with which she worked. The work was conceptualized as an adaptation of W. E. B. Du Bois's *The Souls of Black Folk*. In Kemp's words, this performance:

> [scrutinizes] the physical and psychic safety of African American women from both a historical and a contemporary perspective. This performance, captured in long, quiet and often slow-moving frames, teases out the idea of repetition and endurance and the joy that is needed to not only survive but thrive against seemingly insurmountable odds. (Margaret Laurena Kemp, "This Land Is," mlk, 2019, http://www.mlkemp.space/this-land-is).

Kemp's movements incorporate elements of African American vernacular dance and plantation labor, "negotiating with and shifting the soil within a confined space."[47] The video footage was reclaimed from audience members who captured the performance on their own phones and cameras.

Our most recent iteration of this work, *~~Un~~burning* is a durational video installation with a decoupled score and printed metadata included in *Monitor: Surveillance, Data, and the New Panoptic*, an

exhibition at the Institute of Contemporary Art (ICA) at Maine College of Art and Design in Portland, Maine in 2021. In this version, video documentation of Kemp's performance is intercut with image sequences from the "unburned" FBI aerial surveillance. This silent four-hour video was projected on a wall in the exhibition space that was also visible from the street through a large window perpendicular to the projection. On the wall opposite the window, a fragment of video metadata from the FBI collection was printed extending from the ceiling to the floor. A pedestal, extending from that wall, held a stack of approximately six hundred pages of combined metadata from Kemp's performance and the FBI collection that viewers were invited to page through. Wall text offered the URL and QR code link to a score made in collaboration with composer Richard Chowenhill for visitors to listen to on their own devices. The score is the same duration as the video, but decoupled in time; viewing and hearing are intentionally left out of sync, determined by when a viewer begins playing the sound. The "script" of combined metadata from the FBI collection and performance documentation videos was printed as a 600-page stack of large paper displayed in the space. We conceived the work as bringing together surveillance and witnessing, being overheard and overlooked, hypervisibility and concealment, quantification and abstraction.

During the early stages of our collaboration on this project, I attempted to use temporal metadata from both collections of material (the FBI surveillance and the performance documentation) to automatically arrange the media synchronously to provide us with a rough linear reconstruction of both events for us to work from. This ultimately did not work. There were inexplicable seventeen-hour gaps between clips that should have overlapped. As noted earlier in this writing, sometimes metadata provides multiple timestamps for the same file. Sometimes the time zone is configured incorrectly. Codification of time is subject to complex regional, national, and international law, mixed specifications, and technology that does not always do what it is supposed to. Put another way: sometimes digital time is not as hegemonic as it seems. That is something to celebrate, even if it is inconvenient in the moment of failure. Since the metadata was uncooperative as a functional element of this collaborative work, we decided to use it as a script instead. As one element of the score, both Kemp and I recorded ourselves reading from the 600-page script of combined metadata for five hours each. I recorded my portion of the score over the course of five sessions spanning three days; I imagined that my voice would need to rest, but my eyes were even more uncooperative. I'm still recovering from a corneal transplant that has changed my relationship to technics and discourses of gaze, transparency, and opacity. When I listen to it, there's a sense of immersion, a strangeness to hearing something I associate with a structured visuality shifted to such a different sensory register, but also a familiarity that the audience may not have shared.

The project of expanding this material to operate at duration and scale has caused some important details to blur together in the interest of surfacing something that feels even more urgent to address. A recording of metadata is, in some ways, like an image of it: it is out of its element and unqueriable. The transduction brings a loss of some affordance. While the reading reduces the text in some ways, it opens it up in others. In both its vocalization and its reception, it has a very different sensibility from the six hundred pages of metadata printed for the exhibition. The patterns and correspondences change scale, and its duration calls for a different kind of noticing. The metadata for the collection can be exported to a file in microseconds, but reading it out loud takes an enormous amount of time, as does listening to it. The time zone is set to "Los Angeles" in several of the files, and this repetition is fairly apparent when paging through the printed stack of the script, but because it occurs many minutes apart in the recording, any recognition of this repetition would require a very patient and attentive listener. The seemingly random strings of letters and numbers that make up a property like IdentifierID, such as "c144e197-8995-6b17-

241b-e8b00000008e," become rhythmic and poetic when spoken. When reaching a field like the one that contains the FAA registration code, I found myself wanting to enunciate it differently, to try to call attention to why "N557PG" (a plane's identifier) is more significant than "e8b00000008e" (a seemingly random string of hexadecimal characters in the IdentifierID).

We decoupled the score from the video intentionally to allow this durational mode to work differently, in one sense allowing it to be heard in familiar earbuds or headphones, but also in a way that it would continue to play until they turned it off; potentially extending to their experience of other work in the show or even beyond the gallery itself. We imagined, as a side effect of this design decision, the possibility that the drone-like sounds and spoken metadata of the score would leak into and annotate the rest of some visitor's day, drawing their attention to the other surveillant apparatuses that now saturate daily life.

CONCLUSIONS

The FBI didn't publicly release the collection of surveillance footage until two months after cases against the officers who had been charged in the death of Freddie Gray had led to acquittal or dropped charges.[48] If the footage is released after a moment in which a public might use it to find justice, what is it for? Until that moment, it makes sense to foreground urgent forensic analysis invested in producing something actionable, the kind of material that can change a judge's or jury's mind. That moment of urgency has passed, but the broader crisis continues. Anti-Black policing persists, National Guardsmen will still be called to respond to uprisings, some of the same planes will circle overhead. The project of dismantling this system requires technical, historical, and interpretative work, as well as collective and public acts of solidarity. As Felix Stalder has written, "Repressive orders crumble when people start to lose their fear and act in large numbers, despite being monitored[,] not because they found ways to evade it. Security, in this case, comes from social solidarity and collective action, not from technology."[49] May this continue to be true.

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ENDNOTES

[1] *One Document for Hope*, Now! Journal, 2016, https://vimeo.com/166294244.
[2] Onscreen metadata lists the time as 2:59 a.m. on May 3 in European Central Time (UTC+1), which is 8:59 p.m. on May 2 in local time. Clocks on networked devices tend to be reliable because they synchronize with time servers. It remains unclear to the author whether the reported time is correct.

[3] I recognize that spatially oriented language is in tension with how metadata is perceived and engaged; this tension is explored in this article and elsewhere in my work.
[4] Craig Timberg, "Surveillance Planes Spotted in the Sky for Days after West Baltimore Rioting," *Washington Post*, May 5, 2015, https://www.washingtonpost.com/business/technology/surveillance-planes-spotted-in-the-sky-for-days-after-west-baltimore-rioting/2015/05/05/c57c53b6-f352-11e4-84a6-6d7c67c50db0_story.html.
[5] The site, now defunct, provided a live unarchived police radio stream. Nothing on the site suggests that the person behind it is critical of the police. "Scan Baltimore," April 28, 2015, https://web.archive.org/web/20150428015406/https://www.scanbaltimore.com/.
[6] Scan Baltimore, "Anyone Know Who Has Been Flying the Light Plane in Circles above the City for the Last Few Nights?" Twitter, @scanbaltimore (blog), May 3, 2015, https://twitter.com/scanbaltimore/status/594671214028836864.
[7] Pete's Tweets, "@scanbaltimore It's Registered to NG Research: Http://Registry.Faa.Gov/Aircraftinquiry/NNum_Results.Aspx?NNumbertxt=539MY For Some Other Info: Http://Reddit.Com/r/Nova/Comments/2bgj1p/Plane_circling_over_mcleanlangley_area_last_few/ Http://T.Co/EGXFIKXCgr," Twitter, @pete_cimbolic (blog), May 3, 2015, https://twitter.com/pete_cimbolic/status/594673137691848704.
[8] Timberg, "Surveillance Planes."
[9] Sam Richards, "Fleet of Government Aircraft Flying Secret Missions over U.S. Cities," Medium, July 1, 2015, https://medium.com/@MinneapoliSam/fleet-of-government-aircraft-flying-secret-missions-over-u-s-cities-84cbdf57dfbb; John Wiseman, "How I Tracked FBI Aerial Surveillance," Ars Technica, June 4, 2015, https://arstechnica.com/tech-policy/2015/06/how-i-tracked-fbi-aerial-surveillance/.
[10] The other two video collections at the time were a set of supermarket surveillance footage of Jared Laughner, the man who shot Rep. Gabrielle Giffords in Tucson, Arizona in 2011, and video of the Rodney King beating in 1991. The vault's curatorial logic is opaque. According to contacts at MuckRock, the FBI has rejected FOIA requests that have sought the decision-making process that determines what material is posted to the Vault.
[11] "FBI Records Vault on Twitter," Twitter, accessed October 30, 2020, https://twitter.com/FBIRecordsVault/status/792637202471591936.
[12] Nicholas Mirzoeff, *The Right to Look: A Counterhistory of Visuality* (Durham: Duke University Press, 2011), 48.
[13] Thank you to Andre Brock for this conceptual frame and phrasing.
[14] Daniel Grinberg, "Tracking Movements: Black Activism, Aerial Surveillance, and Transparency Optics," *Media, Culture & Society* 41, (2018): 11, https://doi.org/10.1177/0163443718810921.
[15] Grinberg, "Tracking Movements," 19.
[16] Tongo Eisen-Martin, "Collateral White Skin by Tongo Eisen-Martin," Poetry Foundation November 9, 2021, https://www.poetryfoundation.org/, https://www.poetryfoundation.org/harriet-books/2019/06/collateral-white-skin.
[17] Christina Elizabeth Sharpe, *In the Wake: On Blackness and Being* (Durham: Duke University Press, 2016), 83.
[18] Geoffrey C. Bowker, *Memory Practices in the Sciences*, Inside Technology (Cambridge, MA: MIT Press, 2005), 185.

[19] Abram Stern, "Operational Character Rendition," [2014] 2020, https://oversightmachin.es/ocr/; *Two Questions for Gina Cheri Haspel*, 2020, http://archive.org/details/two-questions-for-gina-cheri-haspel.
[20] Obtaining or discovering something actionable is the goal of surveillance and other intelligence work.
[21] Mols Sauter, "The Illicit Aura of Information," Limn, no. 8 (April 11, 2017), https://limn.it/articles/the-illicit-aura-of-information/.
[22] Sauter, "The Illicit Aura."
[23] Caren Kaplan, "Bomb Sight: The Visual Realism of Aerial Reconnaissance," Society and Space, September 5, 2012, https://www.societyandspace.org/articles/bomb-sight-the-visual-realism-of-aerial-reconnaissance.
[24] Kaplan, "Bomb Sight."
[25] "FBI Admits Providing Air Support to Baltimore Police during Freddie Gray Unrest," *Baltimore Sun*, May 7, 2015, https://www.baltimoresun.com/news/crime/bal-fbi-admits-providing-air-support-to-baltimore-police-during-freddie-gray-unrest-20150506-story.html, quoted in Grinberg, "Tracking Movements," 3.)
[26] For example, the grotesque case of Kenneth Goldsmith's "remixed" reading of Michael Brown's autopsy at Brown University in 2015.
[27] Metadata extracted for use in *Unburning* and this paper was produced using ExifTool, an open-source toolkit created by Phil Harvey for reading and writing metadata.
[28] This internal filename is at odds with public FBI communications about the Baltimore Uprising that refer to it as "protests."
[29] The .ts file extension suggests the sensor encodes video using MPEG transport streams.
[30] "5 U.S. Code § 552 - Public Information; Agency Rules, Opinions, Orders, Records, and Proceedings," LII / Legal Information Institute, https://www.law.cornell.edu/uscode/text/5/552.
[31] A particularly egregious example of FBI noncompliance: Information activist Ryan Shapiro once requested a set of files from the FBI and was sent a black and white image of a floppy disk in response. Ryan Shapiro [@_rshapiro], "Thanks for This Super Helpful #FOIA Release, FBI. #animalrights Https://T.Co/CgJhEHW6Pz," Twitter, March 19, 2018, https://twitter.com/_rshapiro/status/975537711082741760.
[32] Lawrence Abu Hamdan, "AURAL CONTRACT Investigations at the Threshold of Audibility" (doctoral thesis, Goldsmiths, University of London, 2018), https://research.gold.ac.uk/id/eprint/23293/1/VIS_thesis_AbuHamdenL_2018.pdf.
[33] Janus Rose, "Feds Don't Fly Their Secret Surveillance Planes on Weekends," Vice (blog), April 7, 2016, https://www.vice.com/en/article/yp3p5x/feds-dont-fly-their-secret-surveillance-planes-on-weekends.
[34] Peter Aldhous, "The FBI Is Selling a Surveillance Plane It Used on Black Lives Matter Protests," BuzzFeed News, https://www.buzzfeednews.com/article/peteraldhous/fbi-surveillance-plane-auction-sale.
[35] "N557PG Airworthiness," DocumentCloud, https://www.documentcloud.org/documents/6952040-N557PG-Airworthiness.html#document/p400/a568648.
[36] "GSA Auctions, General Services Administration, Government Site for Auctions," https://gsaauctions.gov/gsaauctions/aucdsclnk?sl=91QSCI21343501.
[37] "Aircraft Inquiry," https://registry.faa.gov/AircraftInquiry/Search/NNumberResult?nNumberTxt=N557PG.

[38] Jacob Gaboury, *Image Objects: An Archaeology of Computer Graphics* (Cambridge, Massachusetts: The MIT Press, 2021), 57.
[39] This is a weighted implementation of the W3C Compositing and Blending specification for "difference" blending modes, described as follows: "Subtracts the darker of the two constituent colors from the lighter color." Rik Cabanier and Chris Harrelson, eds., "Compositing and Blending Level 2" (W3C FX Task Force, January 6, 2022), https://drafts.fxtf.org/compositing/#blendingdifference.
[40] Net artist Lisa Jevbratt makes extensive use of this technique in her project *EVIDENCE (Days after Difference)*, 2009.
[41] A FOIA exemption code.
[42] Found at https://oversightmachin.es/findings/unburn/.
[43] Matthew Fuller, *Behind the Blip: Essays on the Culture of Software* (Brooklyn, NY: Autonomedia, 2003), 23.
[44] Rebecca Uliasz, "DOTCam — Rebeccauliasz," https://rebeccauliasz.com/DOTCam.
[45] Federica Frabetti, *Software Theory: A Cultural and Philosophical Study*, Media Philosophy (London; New York: Rowman & Littlefield International, 2015), 96.
[46] Frabetti, *Software Theory*.
[47] Margaret Laurena Kemp and Abram Stern, unpublished dialogue, February 6, 2020.
[48] Sheryl Gay Stolberg and Jess Bidgood, "All Charges Dropped Against Baltimore Officers in Freddie Gray Case," *New York Times*, July 27, 2016, https://www.nytimes.com/2016/07/28/us/charges-dropped-against-3-remaining-officers-in-freddie-gray-case.html.
[49] Felix Stalder, "Re: <nettime> Notes from the DIEM25 Launch," nettime-l (electronic mailing list), https://nettime.org/Lists-Archives/nettime-l-1602/msg00018.html.

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Abram Stern is an artist and scholar whose work builds upon collections of government-produced media and metadata, examining and perforating the material produced by public bureaucracies and the infrastructures that mediate our experience of it. Their projects and collaborations have been exhibited at the Institute of Contemporary Art (ICA) at Maine College of Art and Design, Real Art Ways, the Beall Center for Arts and Technology, Works|San Jose, New Langton Arts, and other fora. Abram received their Ph.D. in Film & Digital Media from UC Santa Cruz.