



A call for de(constructing)-calibration

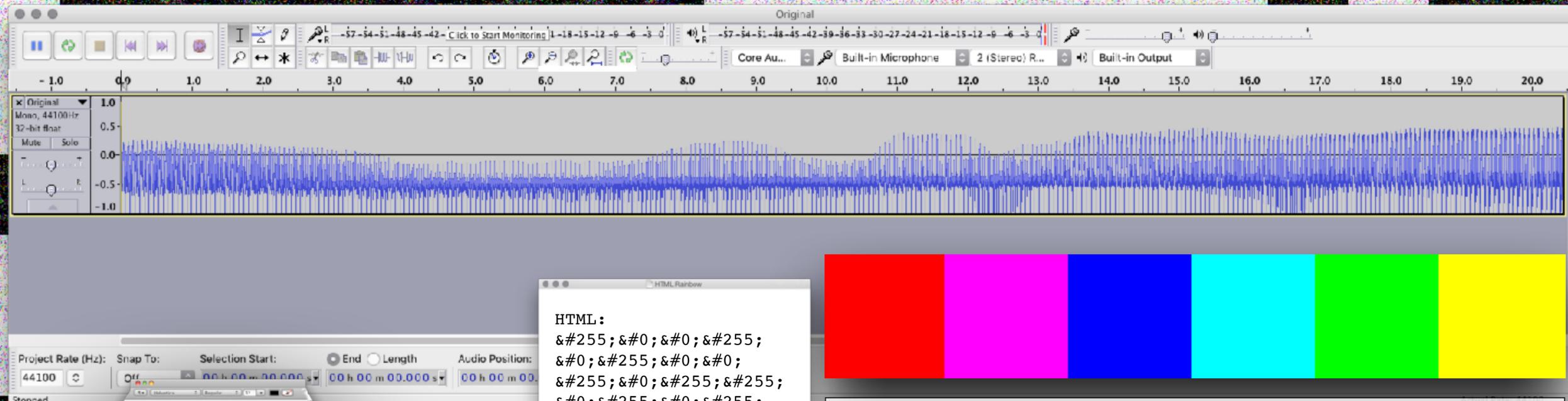
Lena JPG Söderberg, Jennifer in Paradise and the Angel of History.

## Materiality

Postmodern literary critic Katherine Hayles writes that rather than thinking of the mediums' material as fixed in physicality, a re-definition of materiality is useful because it can open the possibility for considering any text as embodied entity while still maintaining a central focus on interpretation.

In this view of materiality, a work is not merely an inert collection of physical properties but a dynamic quality that emerges from the interplay between the text as a physical artifact, its conceptual content, and the interpretive activities of readers and writers.

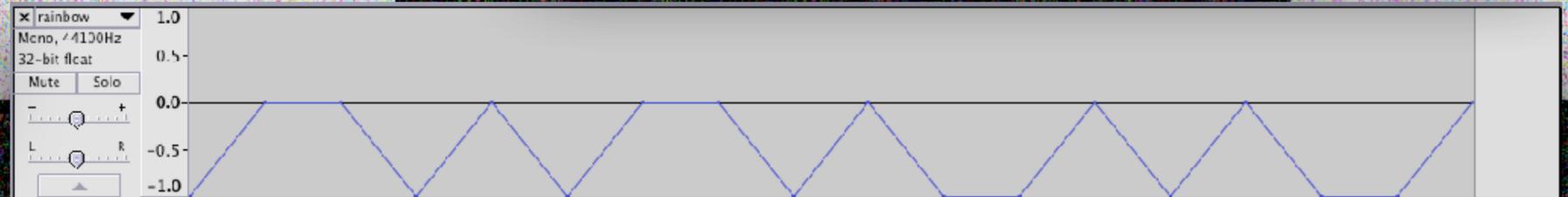
Reflections on materiality should not just take place on a technological level. To fully understand a work, each level of materiality should be studied: the physical and technological artifact, its conceptual content, and the interpretive activities of reader, artist and audience. [the choice of any] digital material is not innocent or meaningless. With enough knowledge of the material, an investigation into digital materiality can uncover stories about the origin and history of the material, by others.



```
HTML:
&#255;&#0;&#0;&#255;
&#0;&#255;&#0;&#0;
&#255;&#0;&#255;&#255;
&#0;&#255;&#0;&#255;
&#255;&#0;
```

A simple 6 pixel wide RGB rainbow created in Photoshop (0-header, 3 channel, interleaved) for instance - can be transcoded into anything, depending the softwares that process it.

Hexcode:  
 FF0000  
 FF00FF  
 0000FF  
 00FFFF  
 00FF00  
 FFFF00



Import the same RAW data into Audacity and the music software will interpret it (backwards).

## For more speculation & access to different levels of the data, we should consider a "Rheology of Data"

A rheology of data involves an exploration of the fluidity of data, or how we can keep data 'leaky' and 'unstable'. These are just two features that are often compromised (precluded) by (proprietary) softwares. However, the act of Syphoning data is important for instance as critique on the constricting and exclusive architectures created by the platforms.

DCT.jpg

Save Copy Cut Paste Undo Redo

Dec Q FF Find (Text search)

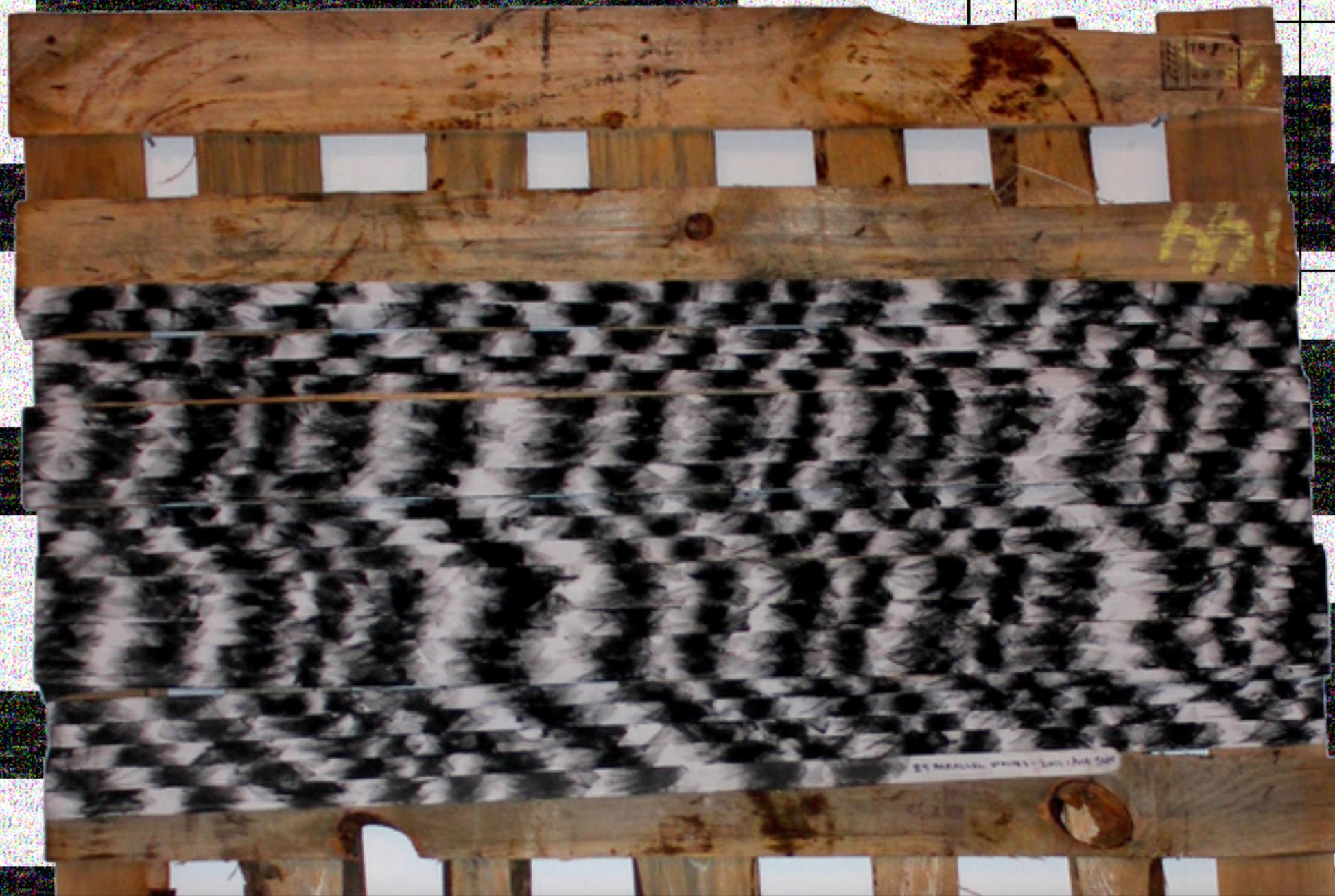
Go To Offset

000000	FF D8 FF E1	37 30 45 78	69 66 00 00	4D 4D 00 2A	00 00 00 08	00 07 01 12	00 03 00 00	00 01 00 01	.....70Exif..MM.*.....
000032	00 00 01 1A	00 05 00 00	00 01 00 00	00 62 01 1B	00 05 00 00	00 01 00 00	00 6A 01 28	00 03 00 00	.....b.....j.(....
000064	00 01 00 02	00 00 01 31	00 02 00 00	00 20 00 00	00 72 01 32	00 02 00 00	00 14 00 00	00 92 87 69	.....1.....r.2.....i
000096	00 04 00 00	00 01 00 00	00 A8 00 00	00 D4 00 0A	FC 80 00 00	27 10 00 0A	FC 80 00 00	27 10 41 64	.....'.....'.Ad
000128	6F 62 65 20	50 68 6F 74	6F 73 68 6F	70 20 43 53	36 20 28 4D	61 63 69 6E	74 6F 73 68	29 00 32 30	obe Photoshop CS6 (Macintosh).20
000160	31 35 3A 30	36 3A 32 34	20 31 37 3A	33 30 3A 31	30 00 00 00	00 03 A0 01	00 03 00 00	00 01 00 01	15:06:24 17:30:10.....
000192	00 00 A0 02	00 04 00 00	00 01 00 00	02 00 A0 03	00 04 00 00	00 01 00 00	02 00 00 00	00 00 00 00	.....
000224	00 06 01 03	00 03 00 00	00 01 00 06	00 00 01 1A	00 05 00 00	00 01 00 00	01 22 01 1B	00 05 00 00	....."
000256	00 01 00 00	01 2A 01 28	00 03 00 00	00 01 00 02	00 00 02 01	00 04 00 00	00 01 00 00	01 32 02 02	.....*(.....2..
000288	00 04 00 00	00 01 00 00	35 F6 00 00	00 00 00 00	00 48 00 00	00 01 00 00	00 48 00 00	00 01 FF D8	.....5.....H.....H.....
000320	FF ED 00 0C	41 64 6F 62	65 5F 43 4D	00 01 FF EE	00 0E 41 64	6F 62 65 00	64 80 00 00	00 01 FF DB	....Adobe_CM.....Adobe.d.....
000352	00 84 00 0C	08 08 08 09	08 0C 09 09	0C 11 0B 0A	0B 11 15 0F	0C 0C 0F 15	18 13 13 15	13 13 18 11	.....
000384	0C 0C 0C 0C	0C 0C 11 0C	0C 0C 0C 0C	.....					
000416	0C 0C 0C 01	0D 0B 0B 0D	0E 0D 10 0E	0E 10 14 0E	0E 0E 14 14	0E 0E 0E 0E	14 11 0C 0C	0C 0C 0C 11	.....
000448	11 0C 0C 0C	0C 0C 0C 11	0C 0C 0C 0C	.....					
000480	0C 0C 0C 0C	FF C0 00 11	08 00 A0 00	A0 03 01 22	00 02 11 01	03 11 01 FF	DD 00 04 00	0A FF C4 01	....."
000512	3F 00 00 01	05 01 01 01	01 01 01 00	00 00 00 00	00 00 03 00	01 02 04 05	06 07 08 09	0A 0B 01 00	?.....
000544	01 05 01 01	01 01 01 01	00 00 00 00	00 00 00 01	00 02 03 04	05 06 07 08	09 0A 0B 10	00 01 04 01	.....
000576	03 02 04 02	05 07 06 08	05 03 0C 33	01 00 02 11	03 04 21 12	31 05 41 51	61 13 22 71	81 32 06 14	.....3.....!1.AQa."q.2..
000608	91 A1 B1 42	23 24 15 52	C1 62 33 34	72 82 D1 43	07 25 92 53	F0 E1 F1 63	73 35 16 A2	B2 83 26 44	...B#\$.R.b34r..C.%S...cs5....&D
000640	93 54 64 45	C2 A3 74 36	17 D2 55 E2	65 F2 B3 84	C3 D3 75 E3	F3 46 27 94	A4 85 B4 95	C4 D4 E4 F4	.TdE..t6..U.e.....u..F'.....
000672	A5 B5 C5 D5	E5 F5 56 66	76 86 96 A6	B6 C6 D6 E6	F6 37 47 57	67 77 87 97	A7 B7 C7 D7	E7 F7 11 00	.....Vfv.....7Gwgw.....
000704	02 02 01 02	04 04 03 04	05 06 07 07	06 05 35 01	00 02 11 03	21 31 12 04	41 51 61 71	22 13 05 32	.....5.....!1.AQaq"..2
000736	81 91 14 A1	B1 42 23 C1	52 D1 F0 33	24 62 E1 72	82 92 43 53	15 63 73 34	F1 25 06 16	A2 B2 83 07	.....B#.R..3\$b.r..CS.cs4.%.....
000768	26 35 C2 D2	44 93 54 A3	17 64 45 55	36 74 65 E2	F2 B3 84 C3	D3 75 E3 F3	46 94 A4 85	B4 95 C4 D4	&5..D.T..dEU6te.....u..F.....
000800	E4 F4 A5 B5	C5 D5 E5 F5	56 66 76 86	96 A6 B6 C6	D6 E6 F6 27	37 47 57 67	77 87 97 A7	B7 C7 FF DA	.....Vfv.....'7Gwgw.....
000832	00 0C 03 01	00 02 11 03	11 00 3F 00	F4 7C FE B9	D2 7A 6D B5	D3 9D 94 CA	2D BB E8 31	D3 30 4C 6F	.....?.. ...zm.....-1.0Lo
000864	7E D9 F4 EB	FF 00 84 B3	F4 69 BA 87	5D E9 1D 35	F5 B3 37 29	94 BE E8 2C	69 92 48 3C	3C 86 07 6C	~.....i..].5..7)....i.H<<..l
000896	AF FE 15 FF	00 A3 59 1F	5A F2 FA 7F	A5 99 88 32	19 83 9F F6	62 F7 3D F5	B4 1C 8A 61	FF 00 A9 3C	.....Y.Z.....2.....b.=...a...2
000928	F7 C3 9C DB	2C FC DA 5F	EA 7E E7 F8	45 58 A8 75	1E 9F 5E 2E	2F 4F 65 58	F8 3D 4B 37	05 B5 5D 6E	.....~...E[.u.^./0eX.=K7..]n
000960	47 B5 B8 D8	C5 9E EA 9E	FB 3F 49 6D	9F 99 8F 8B	FE 93 F4 97	FF 00 C2 43	2C A4 19 0B	8E 9B 7F DE	G.....?Im.....C.....
000992	BA 78 79 08	4E 18 64 61	97 D7 C5 C6	05 47 D3 18	F1 FB B1 32	C7 FC DF FE	1F FE 3B 63	EB 73 D9 60	.xy.N.da....G.....2.....;c.s.`
001024	C0 B2 B7 07	B1 ED B1 CD	73 4C 82 0F	A2 5A E6 B8	2E 79 6C F5	EA B1 E9 C0	E9 35 62 D9	EB 63 D7 4B	.....sL...Z...yl.....5b..c.K
001056	99 55 B2 0E	E6 B5 B4 B5	AF 91 FB CB	19 74 5C 87	FB 97 1F 94	BF E9 C9 BD	C9 80 30 44	0B A0 66 05	.U.....t\.....0D..f.
001088	E9 2F E7 27	B8 62 FF 00	A2 7E 0A CF	F8 E5 73 6F	E8 38 B8 54	B8 3F 28 65	32 F3 40 23	7F A6 DA F2	./.'b...~...so.8.T.?(e2.@#....
001120	2B 36 EC FD	DF 51 FB 15	67 FD 13 F0	56 7F C6 9E	4E 01 A3 17	15 B8 FB FA	83 72 69 B1	CE D8 41 F4	+6...Q..g...V...N.....ri...A.
001152	76 64 B7 D4	6D D1 FA 4A	E8 B5 DF 43	E8 6F 54 FE	31 23 18 63	22 BF 4F 7F	F0 18 F9 AC	31 CD 9B 04	vd..m..J...C.oT.1#c".0.....1..

Type	Value
8 bit signed	
8 bit unsi...	
16 bit signed	
16 bit uns...	
32 bit uns...	

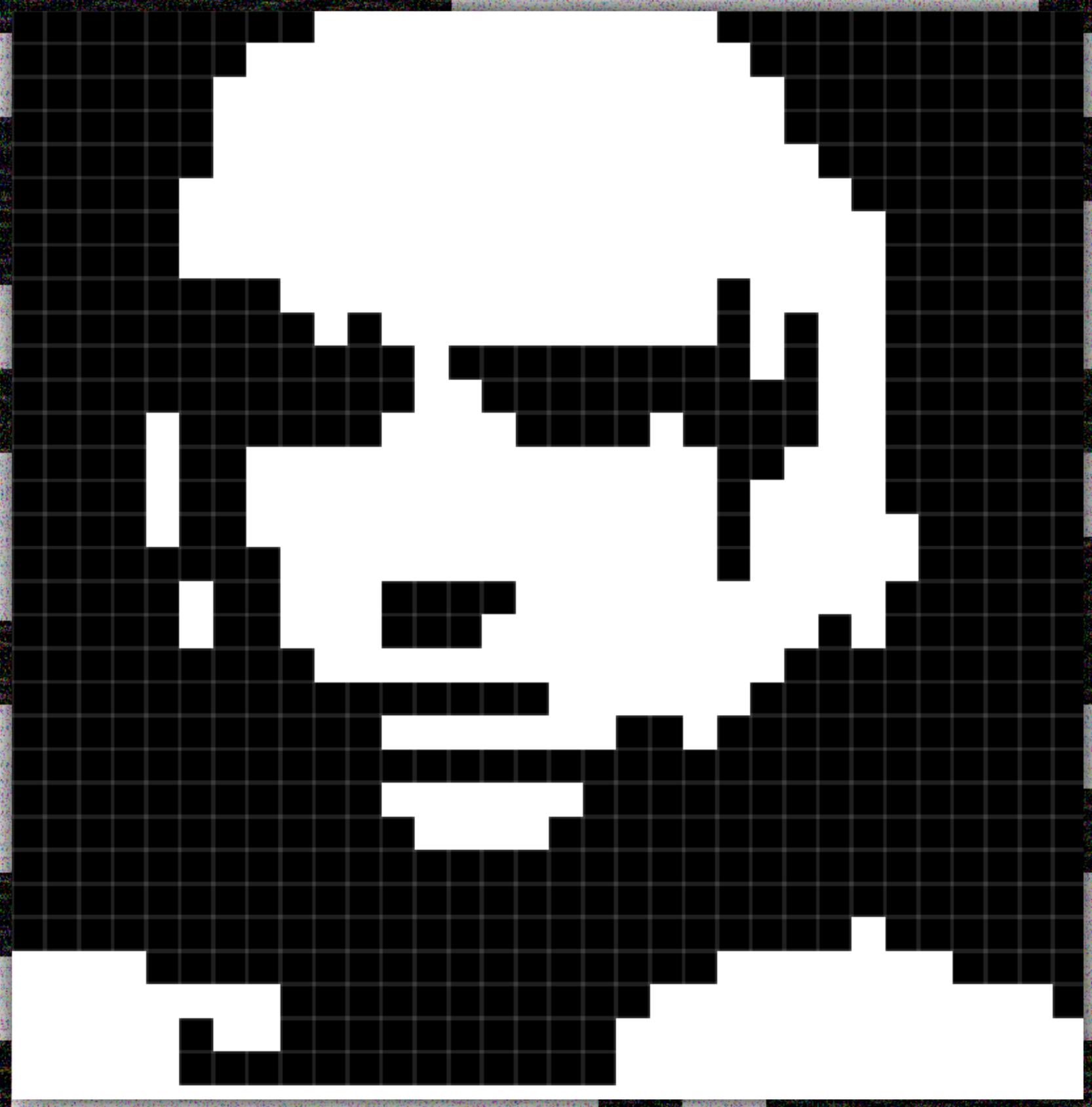
Consider for instance looking at image data in HEX via 0xED (HEX EDITOR FOR MAC): <https://www.macupdate.com/app/mac/22750/0xed>

A hex editor (or binary file editor or byte editor) is a type of computer program that allows for manipulation of the fundamental binary data that constitutes a computer file.



Beflix, Between Yes and No, 2011.

About "Between yes and No": The digital work is not just a one-dimensional data stream, in which all synchronisation cues between the data and the two-dimensional rendering surface are absent. Thus, any two-dimensional rendering of the data is merely one of infinitely many possible choices.





Unresolved (2020) 64 meter long painting -  
<https://beyondresolution.info/unresolved>



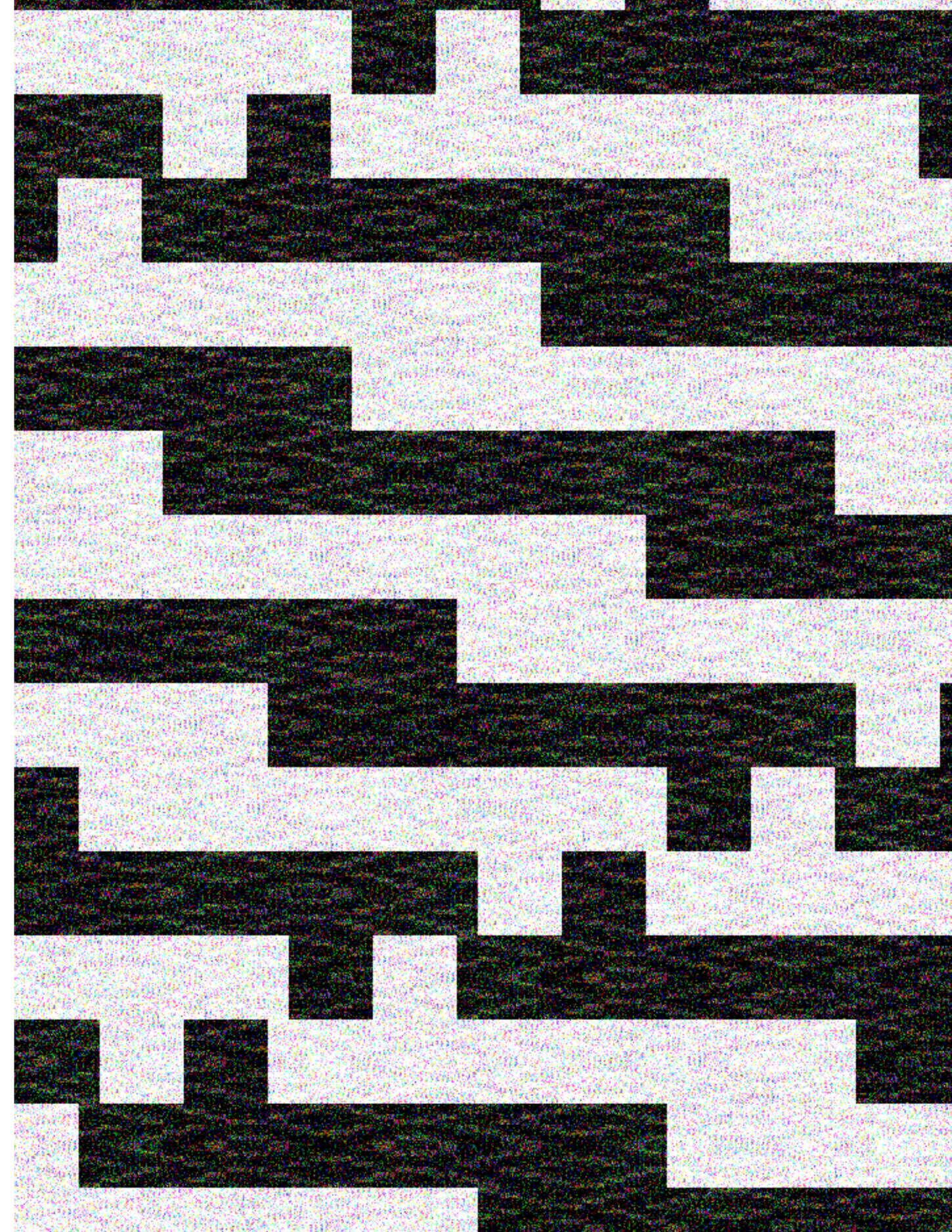
### Unresolved (2020)

64 meters, 32x32x2 pixel file mounted on hardware

Inspired by the 2011 work *Beyond Yes and No*, by new media artist Belfix, *Unresolved* explores an alternative method of visualising data.

Reproducing two 32x32 pixel bitmap images, Menkman painted a 64 meter long tape, and then mounted the double sided work on hardware (a wooden frame).

*Unresolved* presents an image on one side and a jpeg compression on the other. The work illustrates that bitmap images are merely string of data that can be copied, pasted and otherwise altered. Through this work, Menkman explores the ways in which a bitmap file, when opened in different formats, can create alternate modes of reading.



# A VERNACULAR OF FILE FORMATS

A Vernacular of File Formats (2010)

<https://beyondresolution.info/A-Vernacular-of-File-Formats-1>

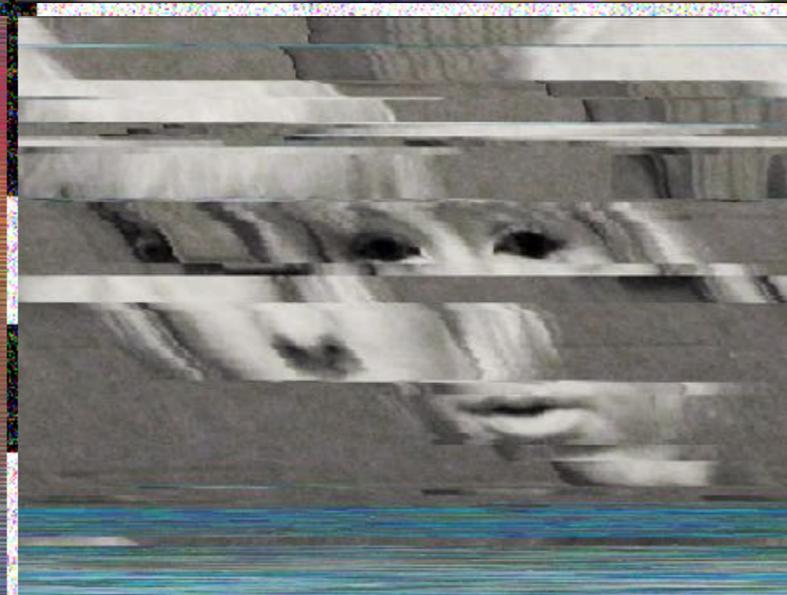
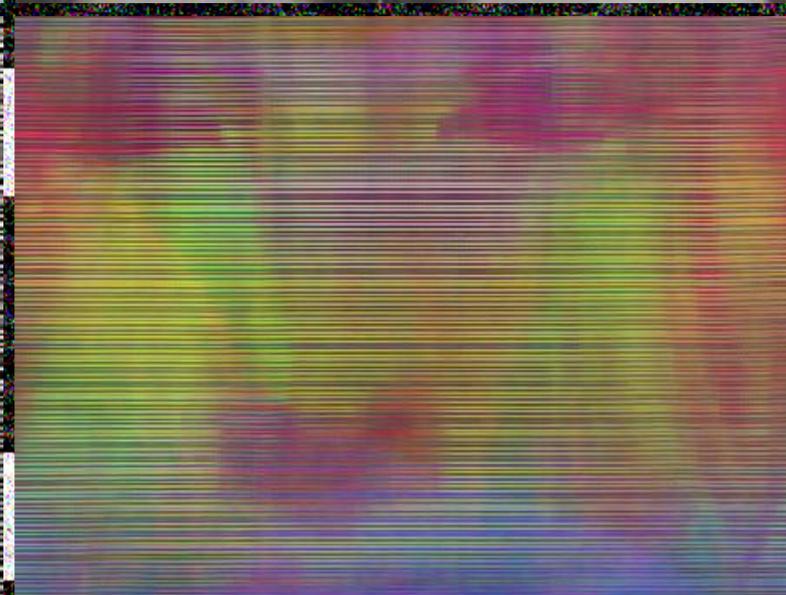


A Vernacular of File Formats (2010) installed in 2020 in the Museum of Modern Art in Amsterdam  
<https://www.stedelijk.nl/nl/collectie/100175-rosa-menkman-a-vernacular-of-file-formats>



Rosa Menkman, *It Takes More than the Past to Understand and Build the Archive*, video, 34:43, 2020.

A Vernacular of File Formats (2010) installed in 2020 in the Museum of Modern Art in Amsterdam  
<https://stedelijkstudies.com/journal/it-takes-more-than-the-past-to-understand-and-build-the-archive/>





# Photoshop RAW

flat binary (header = 0)

A channel is the grayscale image of the same size as a color image, made of just one of these primary colors. For instance, an image from a standard digital camera will have a red, green and blue channel. A grayscale image has just one channel.



# BMP

BMP is an uncompressed file format.  
imagebending vs databending

**Wordpad effect** pietjepuk666 & Stallio:

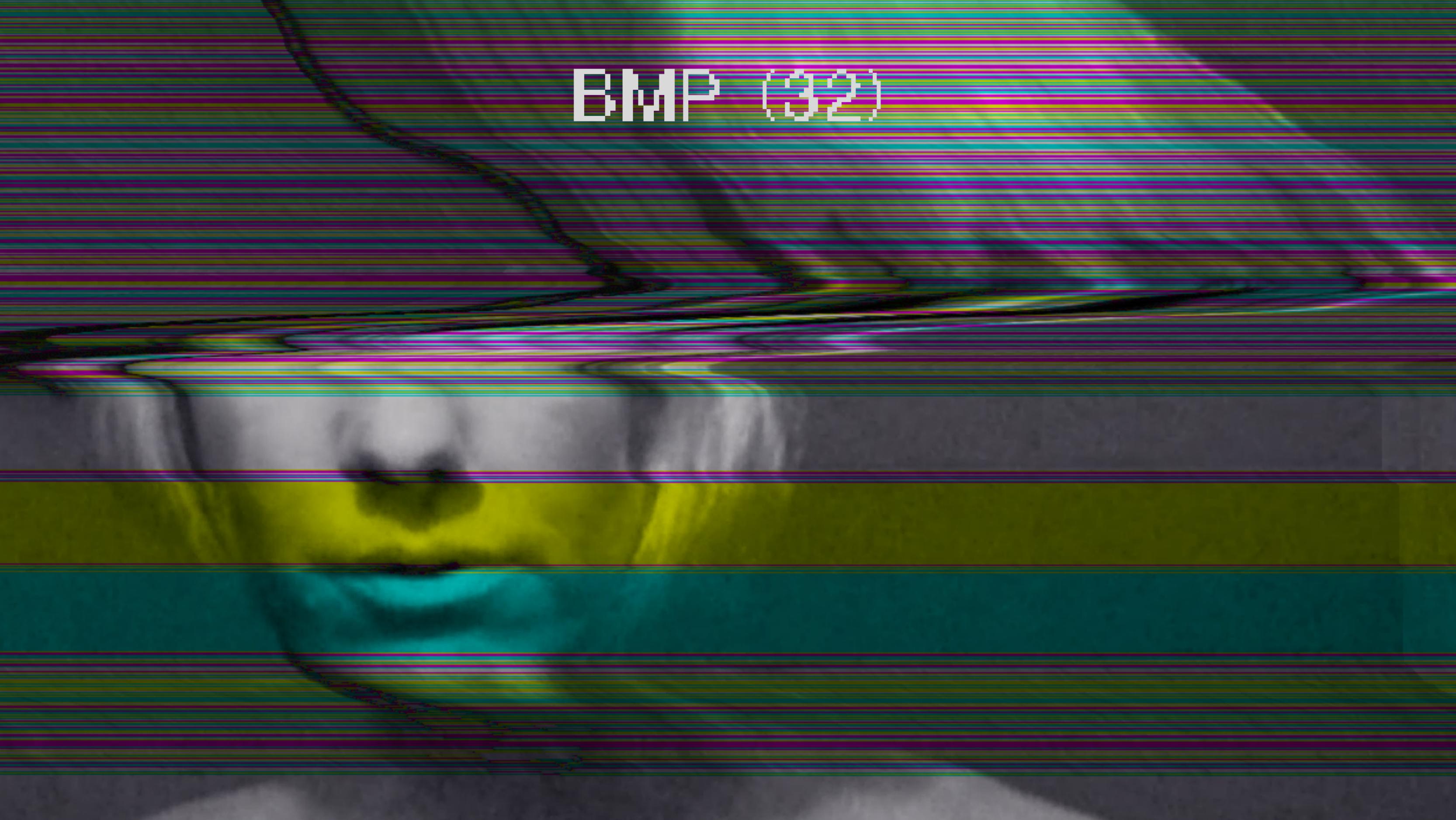
(open as unicode - mac os Roman) does at least two things to a binary file.

"I've found that Wordpad does at least two things to a binary file: it replaces byte 07 (ascii: BEEP) with 20 - a space - , and it replaces every lonely 0A or 0D (line feed - end of line - and carriage return - new line of text - respectively) and also 0B (vertical tab) with the bytes "0D 0A". So the rate of glitching is probably dependent on how dark the picture is, since low bytes like these give dark pixels (i suppose).

in short: everytime it adds one byte."

BMP (16)

BMP 02



# GIF

(8bit color depth, interlaced - 2f replaced for c0)

Graphics Interchange Format is a bitmap image format that supports 8 bits per pixel and can thus consist of no more than 256 colors. The format supports animation. Dither (the grainy blocky artifacts) is an intentionally applied form of noise used to "randomize quantization error": the difference between the actual analog value and quantized digital value. This error is caused by truncation (the discarding of less significant information). Dither thus helps to prevent from large-scale patterns such as "banding" (stepwise rendering of smooth gradations in brightness or hue). Moreover, the not available colors are approximated because the human eye perceives the diffusion as a mixture of the colors. This creates the illusion of color depth.

# GIF

(8bit color depth, interlaced - 2f replaced for c0)



The gif format uses a 4 pass one dimensional interlacing strategy. This means that one half of the image, consisting of every other row of pixels is rendered after the other half. In the image on the left this shows through a gradual displacement during weaving (the putting together of the two layers), which resulted in a second "ghost image" (or combing artifacts with jagged edges).



GIF

(1bit color depth)

# GF

(16bit color depth, non-interlaced - 2f replaced for c0)

GF

(b) color depth, interlaced)



FF00CC

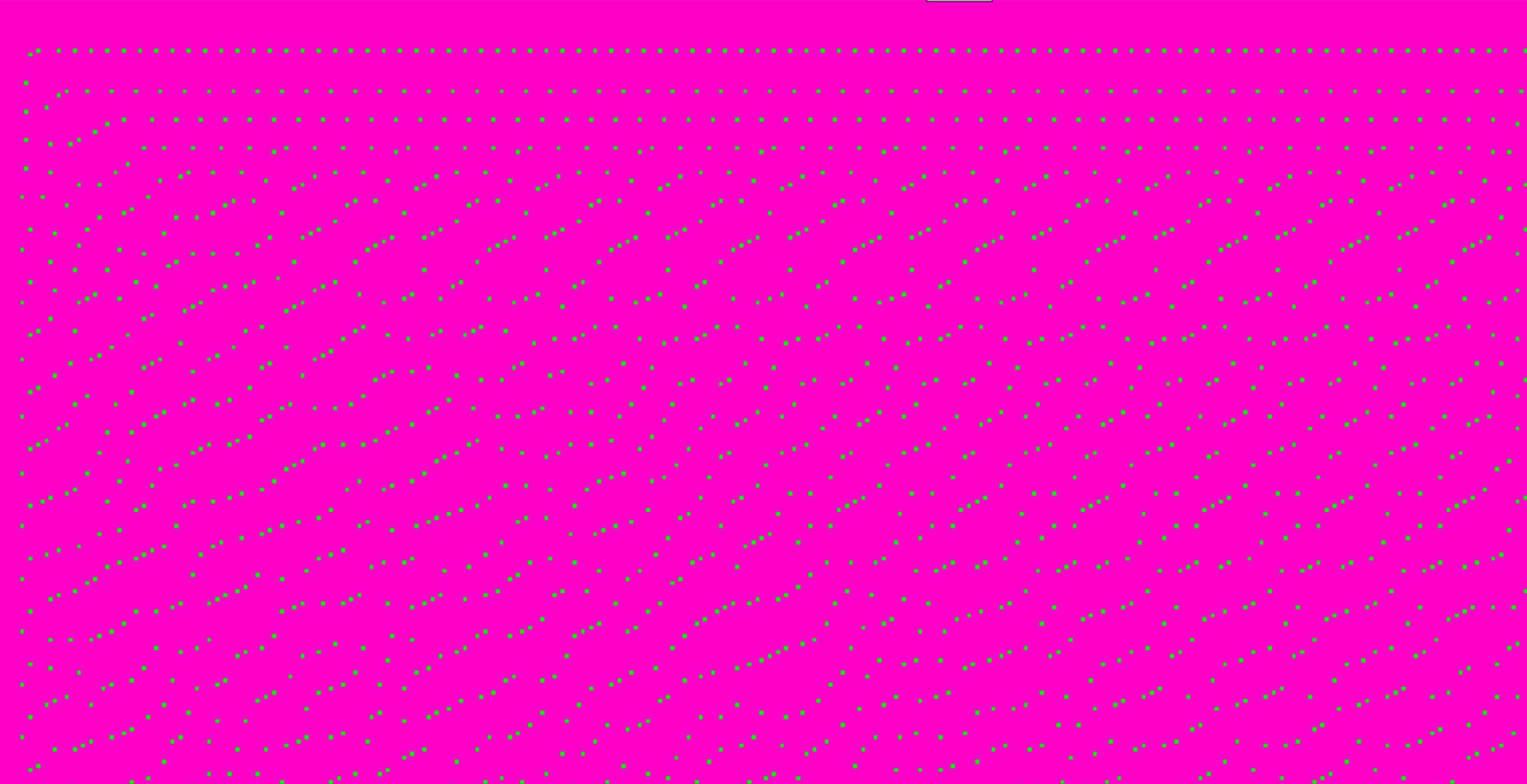


00FF00

Floyd-Steinberg



Dithering Path:  Horizontal  Serpentine [Download as Image](#) [About Dither Studies](#) [Permalink](#) [Hide menu \(press s to show\)](#) w:  h:



# LOSSY: JPG



A JPG compression consists of 6 subsequent steps:

1. Color space transformation
2. Downsampling
3. Block splitting
4. Discrete cosine transform
5. Quantization
6. Entropy coding

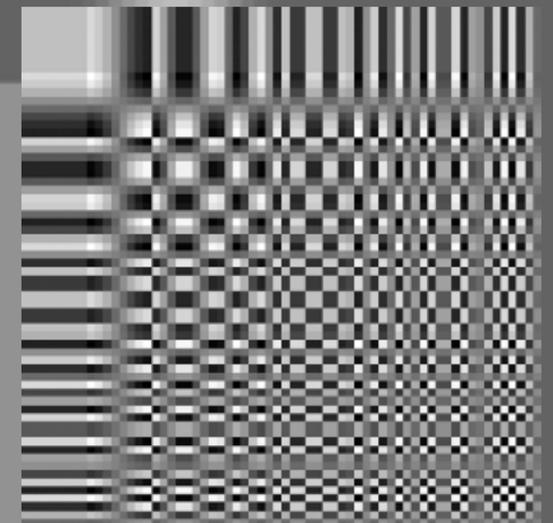
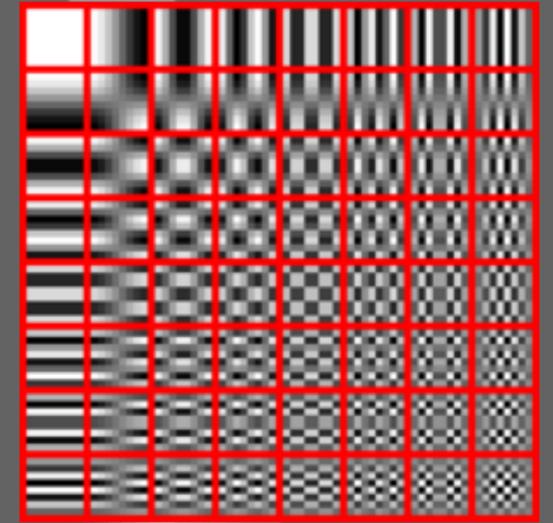
1. Initially, images have to be transformed from the RGB color space to another color space (called Y'CbCr), Here the Y refers to the luma or brightness and the Cb and Cr values stand for the chroma or color values for the blue and the red channel.

2. Because the human eye doesn't perceives small differences within the Cb and Cr space very well, these elements are downsampled.

3. After the color space transformation, the image is split into tiles or macroblocks. Rectangular regions of the image that are transformed and encoded separately.

4. Next, a Discrete Cosine Transform ([which works similar to the Fourier Transform function, exploited in datamoshing and macroblock studies](#)) is used to create a frequency spectrum, to transform the 8x8 blocks to a combination of the 64 two-dimensional DCT basis functions or patterns (as differentiated by the red lines).

5. During the Quantization step, the highest brightness-frequency variations become a base line (or 0-value), while small positive and negative frequency differentiations get a value, which take many fewer bits to represent.

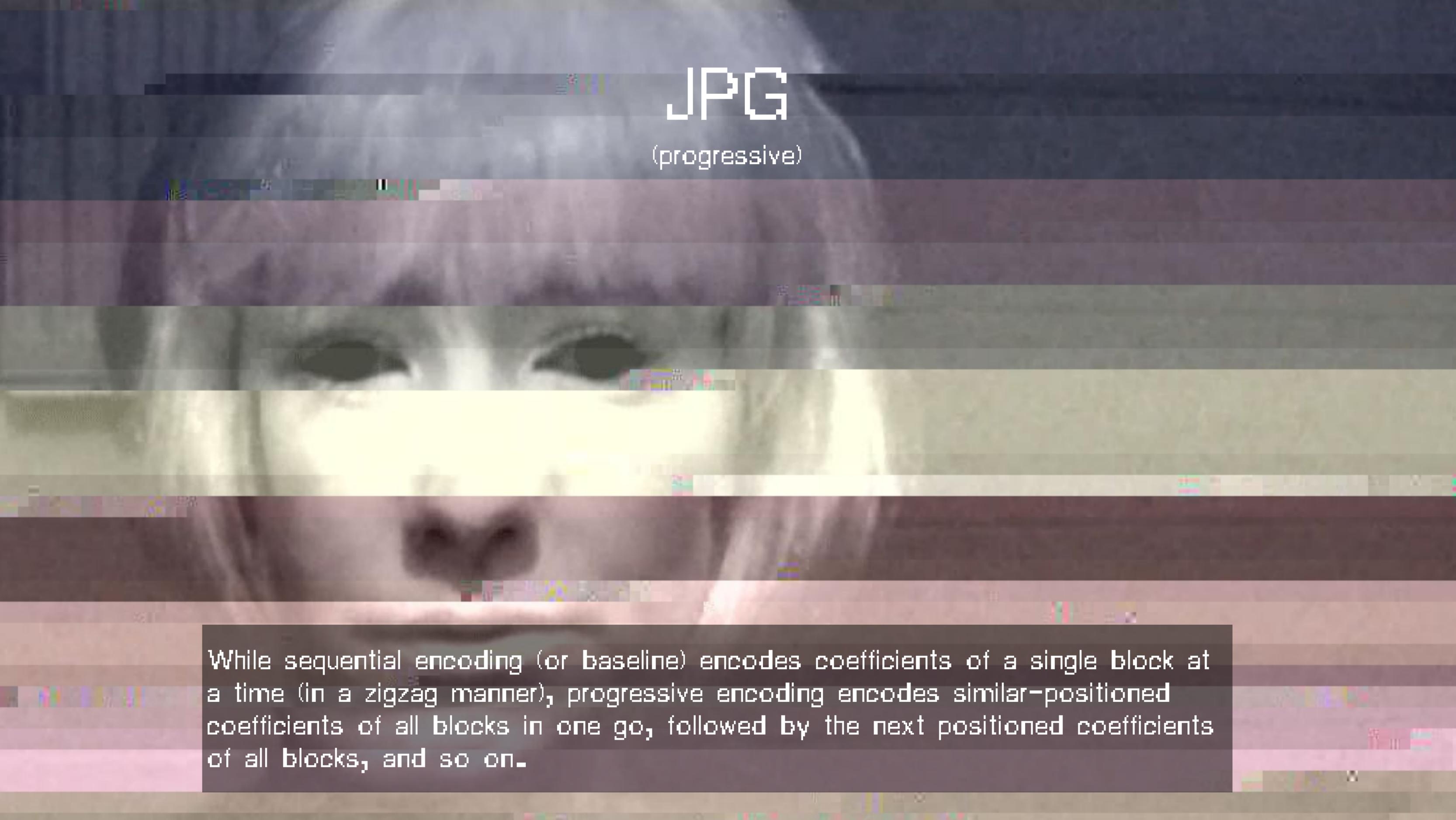


6. finally, entropy coding is applied. Entropy coding is a special form of lossless data compression that involves arranging the image components in a "zigzag" order. This allows the quantized coefficient table to be rewritten in a zigzag order to a sequence of frequencies. A run-length encoding (RLE) algorithm groups similar frequencies together and after that, via "Huffman coding" organizes what is left.

Because the RGB color values are described in such a complex algorithms, some random data replacement often results into dramatic discoloration and other effects.

The very high compression ratio of this jpg effects the quality of the image and the size of the artifacts.

When using quantization with block-based coding, as in these JPEG-compressed images, several types of often unwanted artifacts can appear, for instance ringing or ghosting. In the bend image to the left, the low quality and corruption have made these artifacts more apparent.



# JPG

(progressive)

While sequential encoding (or baseline) encodes coefficients of a single block at a time (in a zigzag manner), progressive encoding encodes similar-positioned coefficients of all blocks in one go, followed by the next positioned coefficients of all blocks, and so on.



Rosa Menkman and Johan Larsby, Monglot, 2011.

**Mongrel:** Animal from a mixed background, bastard, crossbreed.  
**Monoglot:** (person) knowing one language only.  
Glitch transcoding software that automates the transcoding of the same error within different file formats, to visualize compression languages.

# ANTONIO ROBERTS

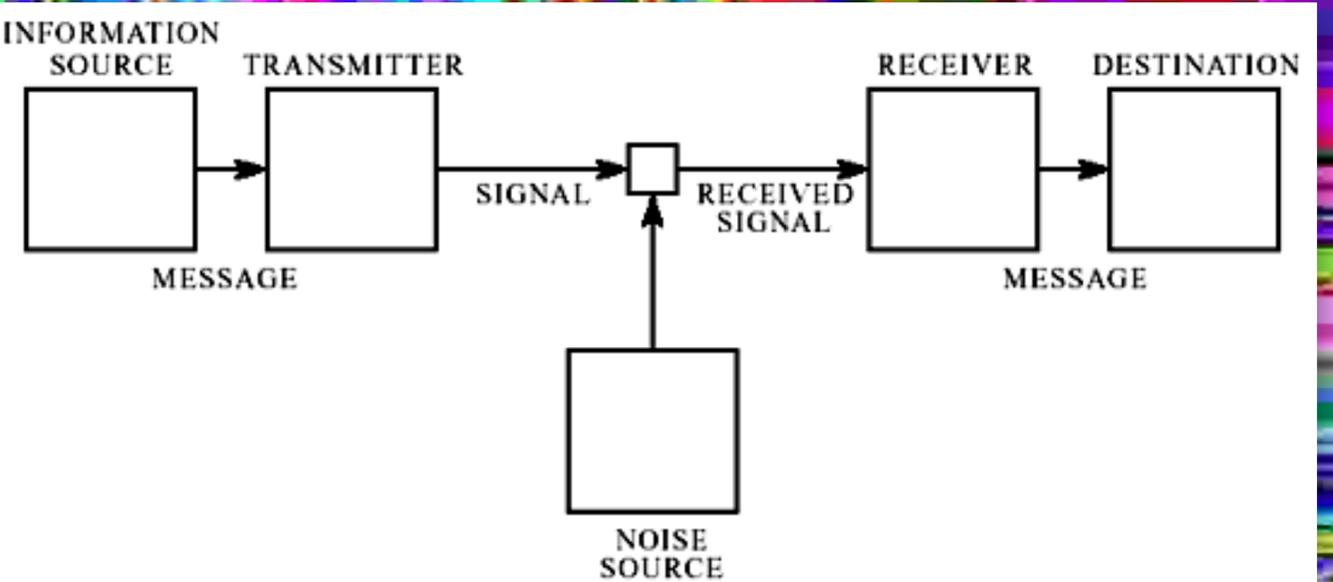
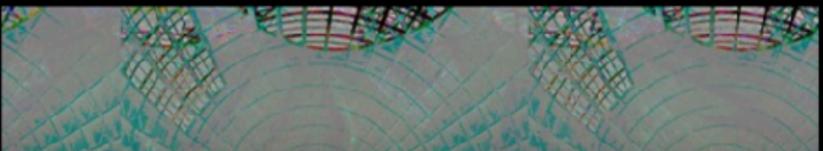
- (hellcatfood)
- 
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## DATABENDING USING AUDACITY

by hellcatfood · 16/11/2009

Thanks to some help on the Audacity forum I finally know out how to use Audacity to databend. Previously I'd been using mhWavEdit, which has its limitations and just doesn't feel as familiar as Audacity. From talk on the various databending discussion boards I found that people would often use tools like Cool Edit/Adobe Audition for their bends. Being on Linux and restricting myself to things that run natively (i.e. not under Wine) presented a new challenge. Part of my task was to replicate the methods others have found but under Linux. My ongoing quest is to find things that only Linux can do, which I'm sure I'll find when I eventually figure out how to pipe data through one program into another!

Here's some of my current results using Audacity:

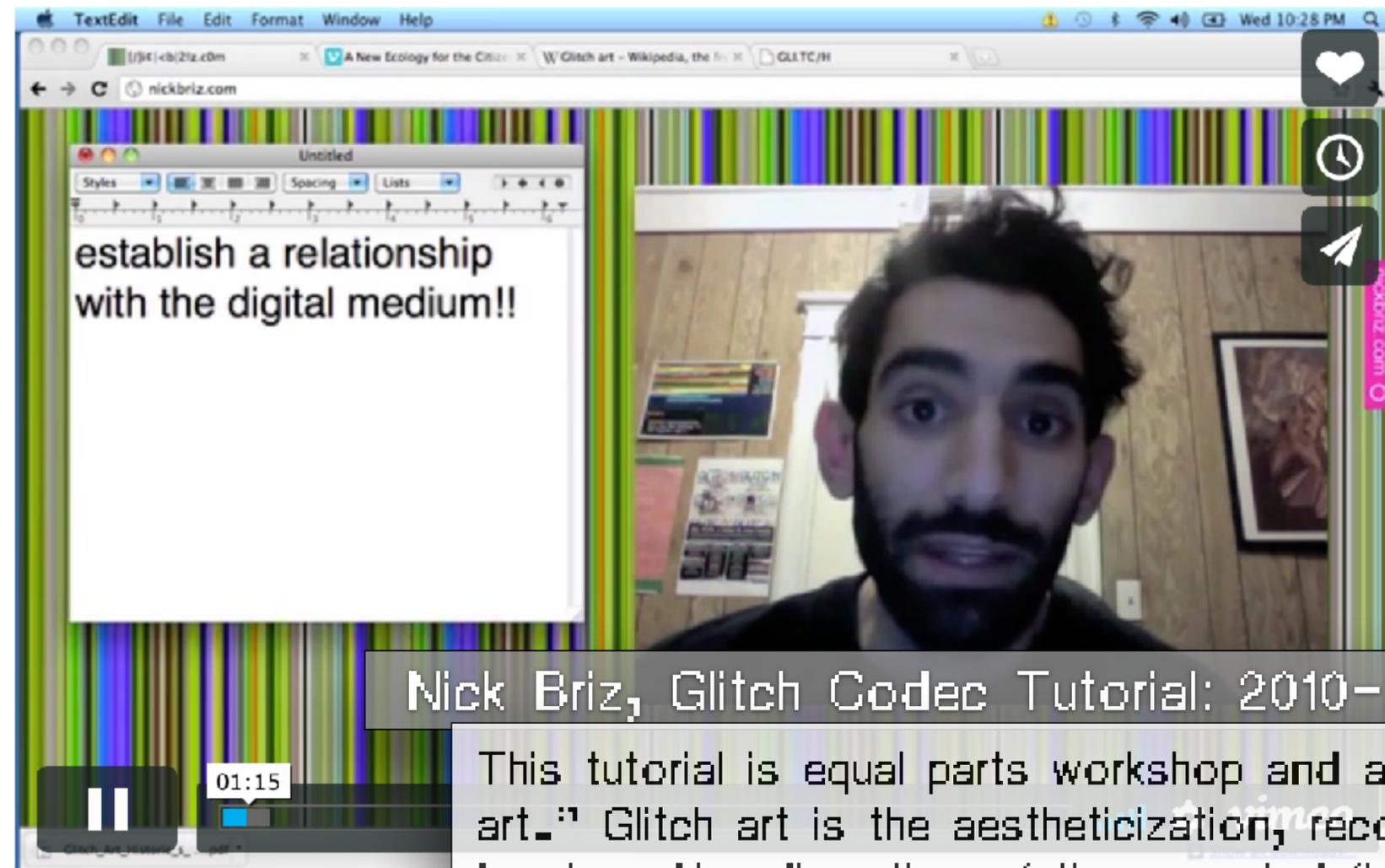


I redid this tutorial for you in a PDF that deals with signification and more:  
<https://beyondresolution.nyc3.digitaloceanspaces.com/RAW%20DATABENDING.pdf>

# GLITCH CODEC TUTORIAL

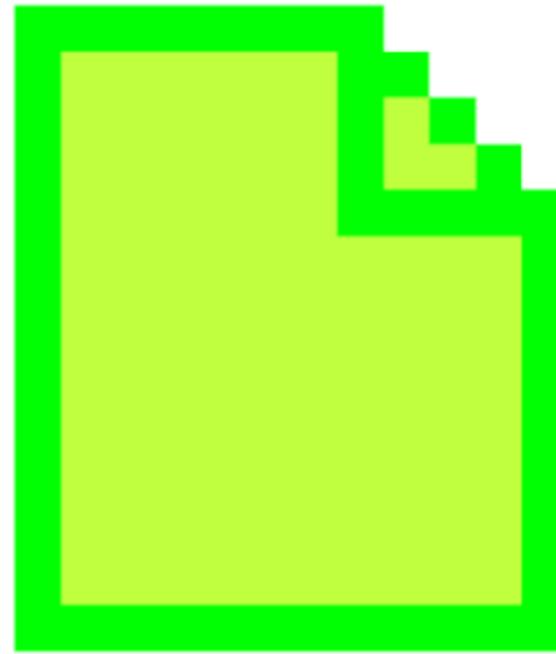
ABOUT | VIDEO | DOWNLOAD | SHARE |

```
//-----// //-----//  
// Watch Full Tutorial // or // Watch in Parts //  
//-----// //-----//
```



Nick Briz, Glitch Codec Tutorial: 2010-2011.

This tutorial is equal parts workshop and artist lecture the subject of which is "glitch art." Glitch art is the aestheticization, recognition, and/or instigation of a glitch, a break and/or disruption of the expected flow of a system.



## ExtraFile

*New image file formats for artistic purpose.*

Kim Asendorf, ExtraFile: 2011.

[About](#)

[Formats](#)

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[Credits](#)

ExtraFile is conceptual software art but with a practical usage.

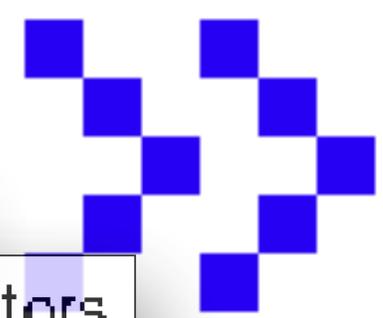
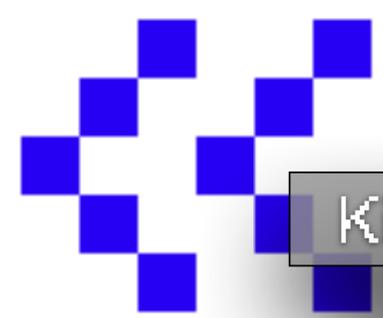
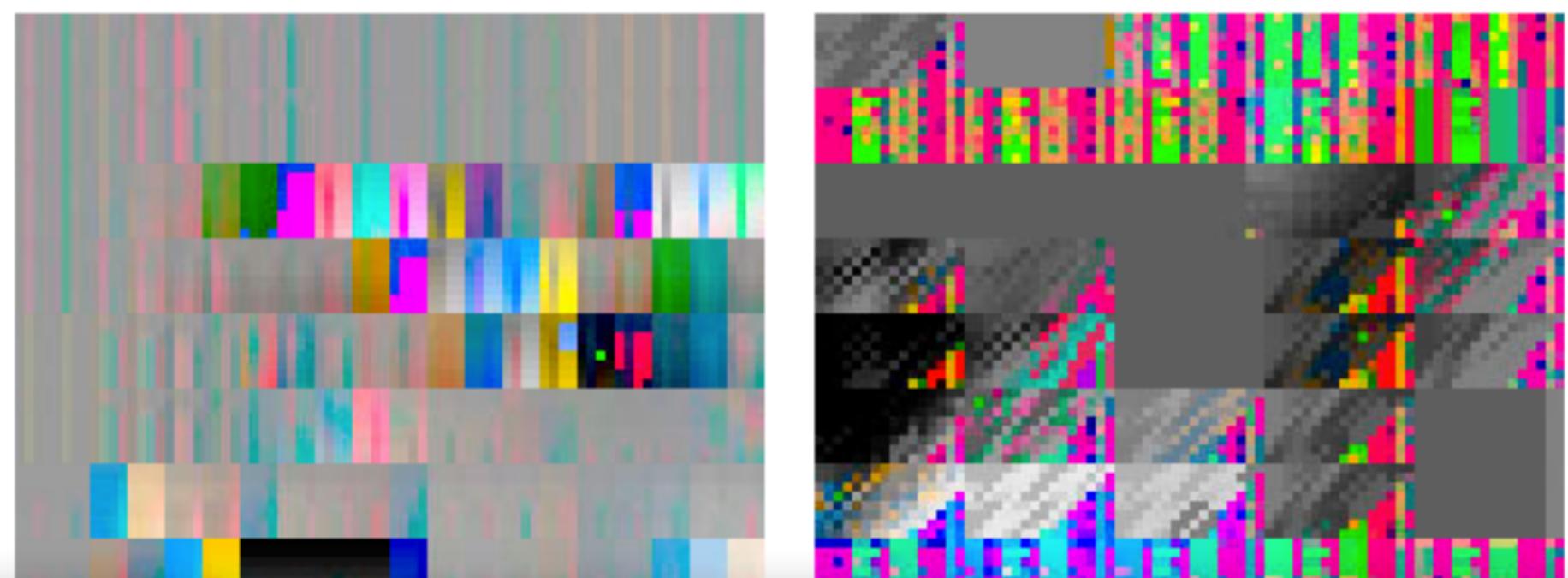
Its main intention is to wiggle the static system of image file formats.

All started with the idea of inventing a new image file format, a format as a piece of art. Far away from the mainstream and commercial standards. Just to express the feeling of using and saving data in a new, fictitious or artificial way. Getting the filename extension into the scope of the artwork itself. In simple terms: Creating an exclusivity.

The freedom not to have to pay attention to the file size or the loading and saving times provides the option to implement artistically byte orders, odd quality behaviors and visual designed formats.

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- [jimpunk](#)
- [Jose Irion Neto](#)
- [Pixelnoizz](#)
- [Rosa Menkman](#)
- [Ted Davis](#)

**Rosa Menkman**  
Amsterdam, Netherlands  
<http://rosa-menkman.blogspot.com>



Kim Asendorf, Extrafile, 2011.

“New image file formats for artistic purposes. Digital artists and collectors deserve exclusive formats to personalize their files, including custom headers and comments. In an Extrafile, every bit can be placed and compressed in the way the artist prefers it.” - Kim Asendorf.



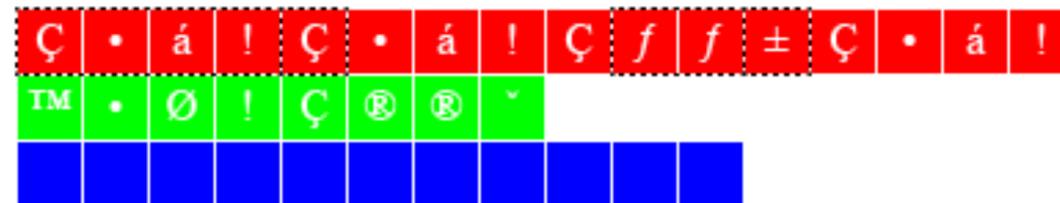
# BLINX

Index Value

Block Length (Bytes)

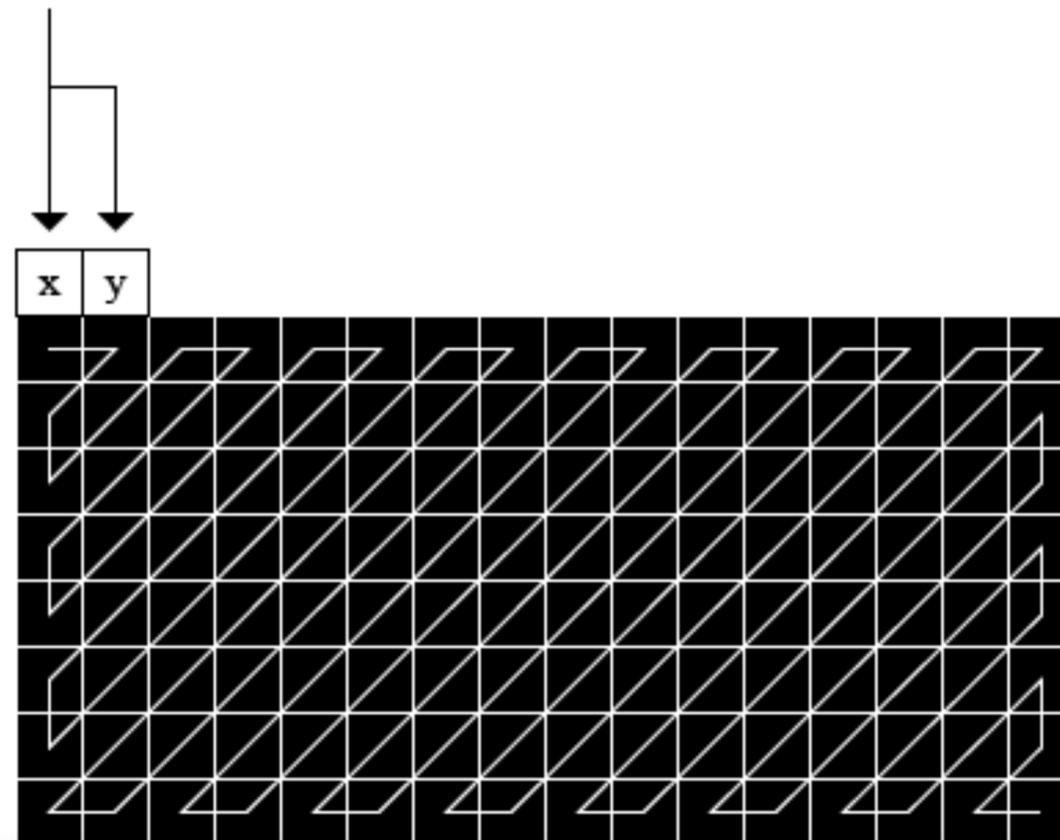
Color Values

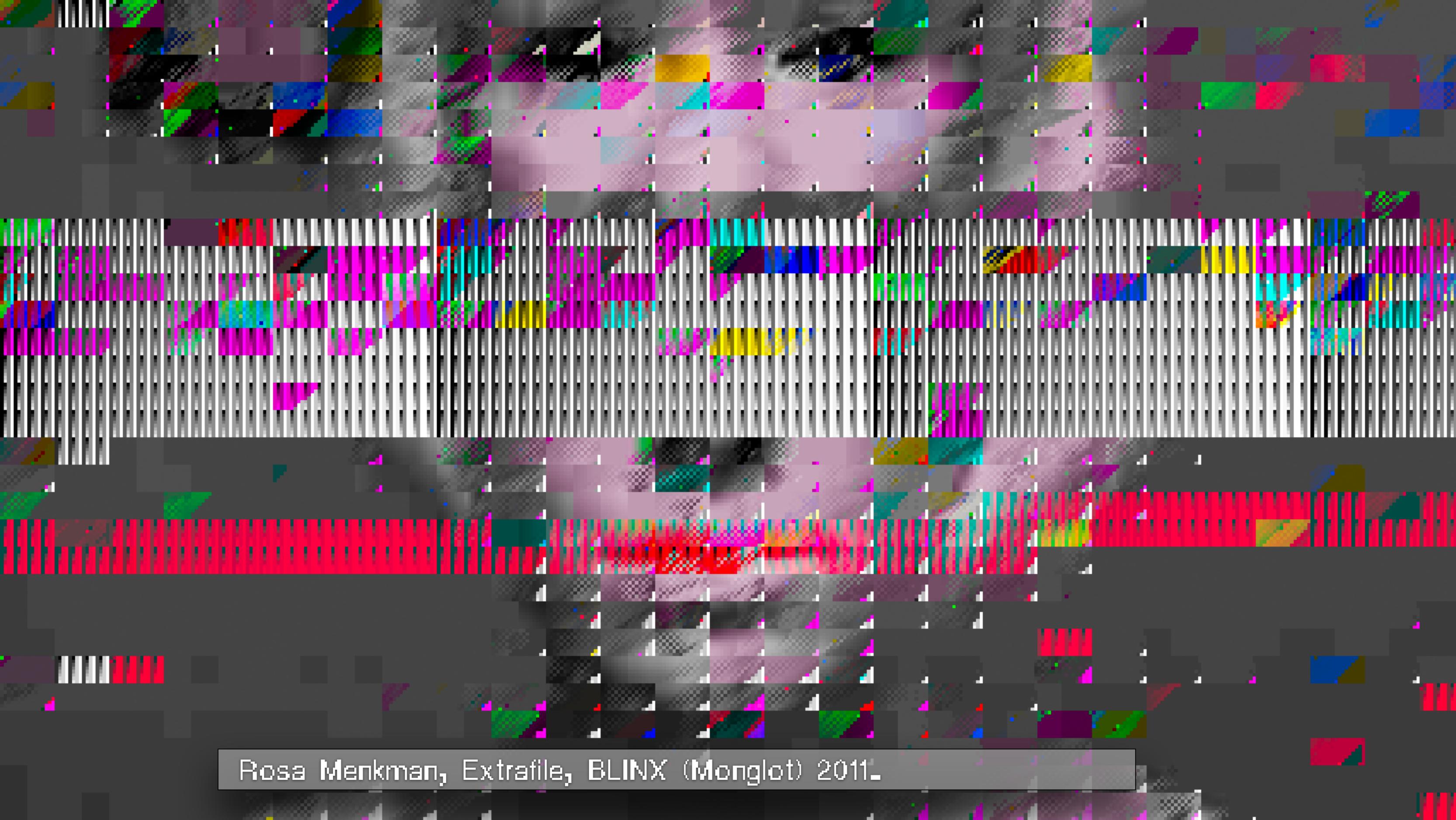
Binary



Position

Pixel grid





Rosa Menkman, Extrafile, BLINX (Monglot) 2011.



Love Letter updated her profile picture.

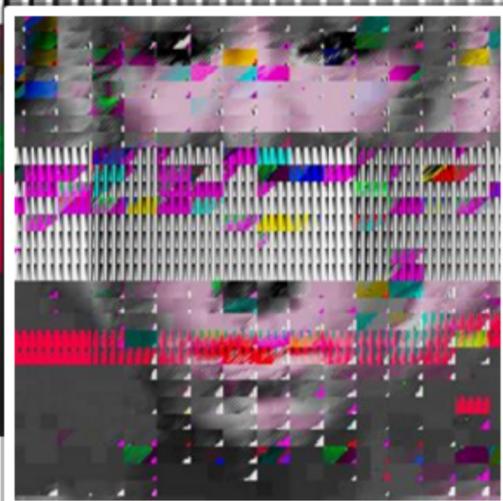
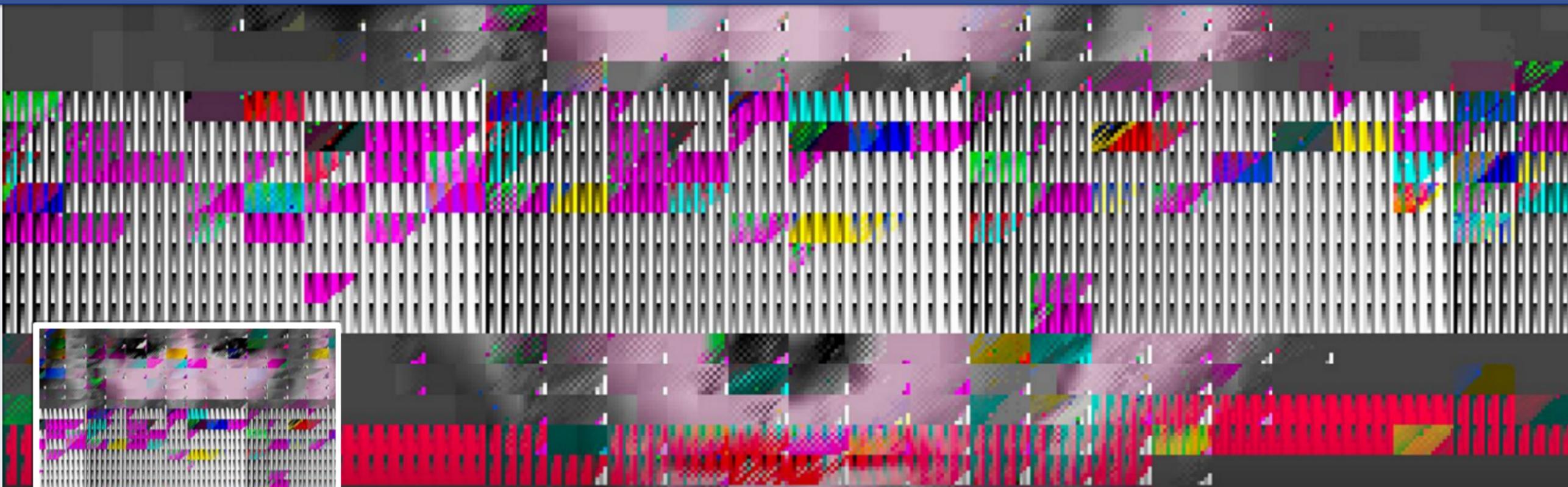


26 September at 22:10 · 🌐



👍 Fátima Queiroz and 3 others

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Wendy Nikaj

Friends

Timeline

About

Friends 435 Mutual

Photos

Intro

- Works at MOMA
- Studied at Université Paris 1 - Panthéon Sorbonne
- Lives in Paris, France
- From Las Vegas, Nevada

Post Photo/Video

Write something...

POSTS YOU HAVEN'T SEEN



Wendy Nikaj shared Systeime's  
4 March at 14:44



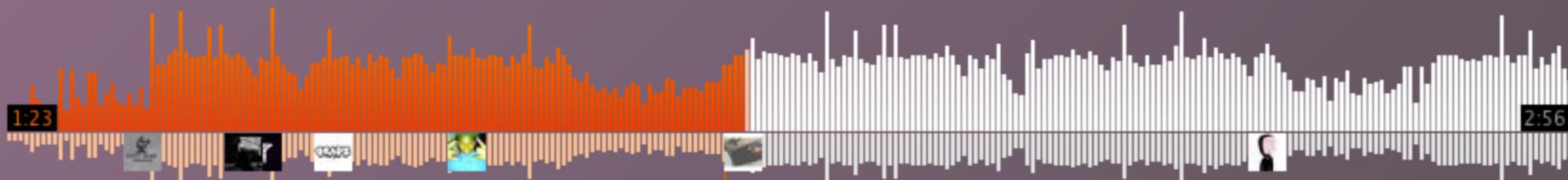


Yung Joey

# "Bout Me" [Prod. By Doe Pesci]

5 months

#F1



1:23

2:56

Young Juice (GROV... AYYE! THIS SOME HOT SHIT



Write a comment...

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- Repost
- Add to playlist
- Share
- Download

5,137 140



Yung Joey

305 5

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Yung Joey - "Bout Me" - 2015 - HipHop #Rap #Premis #F1Jo

Recommended View all

Bankroll Fresh  
Buss It (Prod. By Spinz & Nitti)  
6,489 122 27

Home / Tops / Hoodie / blooskjs



# BLOOSKJS

Hoodie

By Francisco Otero

\$88.00

Shhshsbsnap

QUANTITY

SIZE

ADD TO CART

DETAILS

SIZE

FABRIC & CARE

Blooskjs PAOM sweater by Francisco Otero.

Hooray because the 100% cotton Print All Over Me Hoodie of your dreams has arrived! The hoodie features a generous kangaroo pocket up front and a drawstring hood, and it's long enough to slouch just right. Pair the hoodie with its Edition 4 siblings, the men's drop pant or women's drawstring pant to



PHON.O

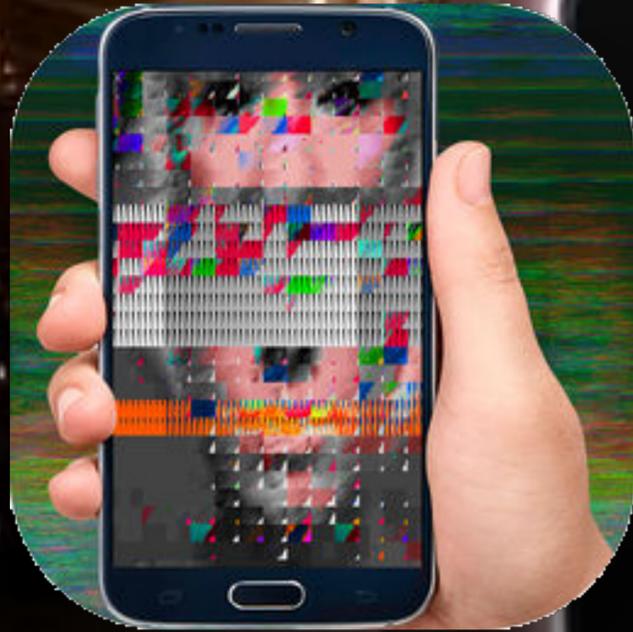
PHON O - Fractions Ep - BPC326 (Snippets)

SOUNDCLOUD

Share



Phon.o Who wore it better



glitch

Glitch camera app

The background of the entire image is a dark, textured grid pattern. Overlaid on this grid is a composite image of a woman's face. The top half of the face is visible, showing her eyes and forehead. The bottom half of the face is obscured by a dark, shadowy area. The word "GLASS" is written in large, white, sans-serif capital letters across the middle of the image, with horizontal lines above and below it.

# — GLASS —

A TRUE STALKING

Written and directed by LilyBaldwin.

Lily Baldwin: Glass poster image,

As I am sure you (who are you) understand a work like developing and expanding the Image Processor requires much money and time. The 'U' does not have much money for evolutionary work and getting of grants are almost as much work as holding down a job. Therefore, I have the feeling that if considerable monies were to be made with a copy of the Image Processor, I would like some of it.

Put in your own method of returning energy to me here: \_\_\_\_\_

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Of course enforcing such a request is too difficult to be bothered with. But let it be known that I consider it to be morally binding.

Much Love,

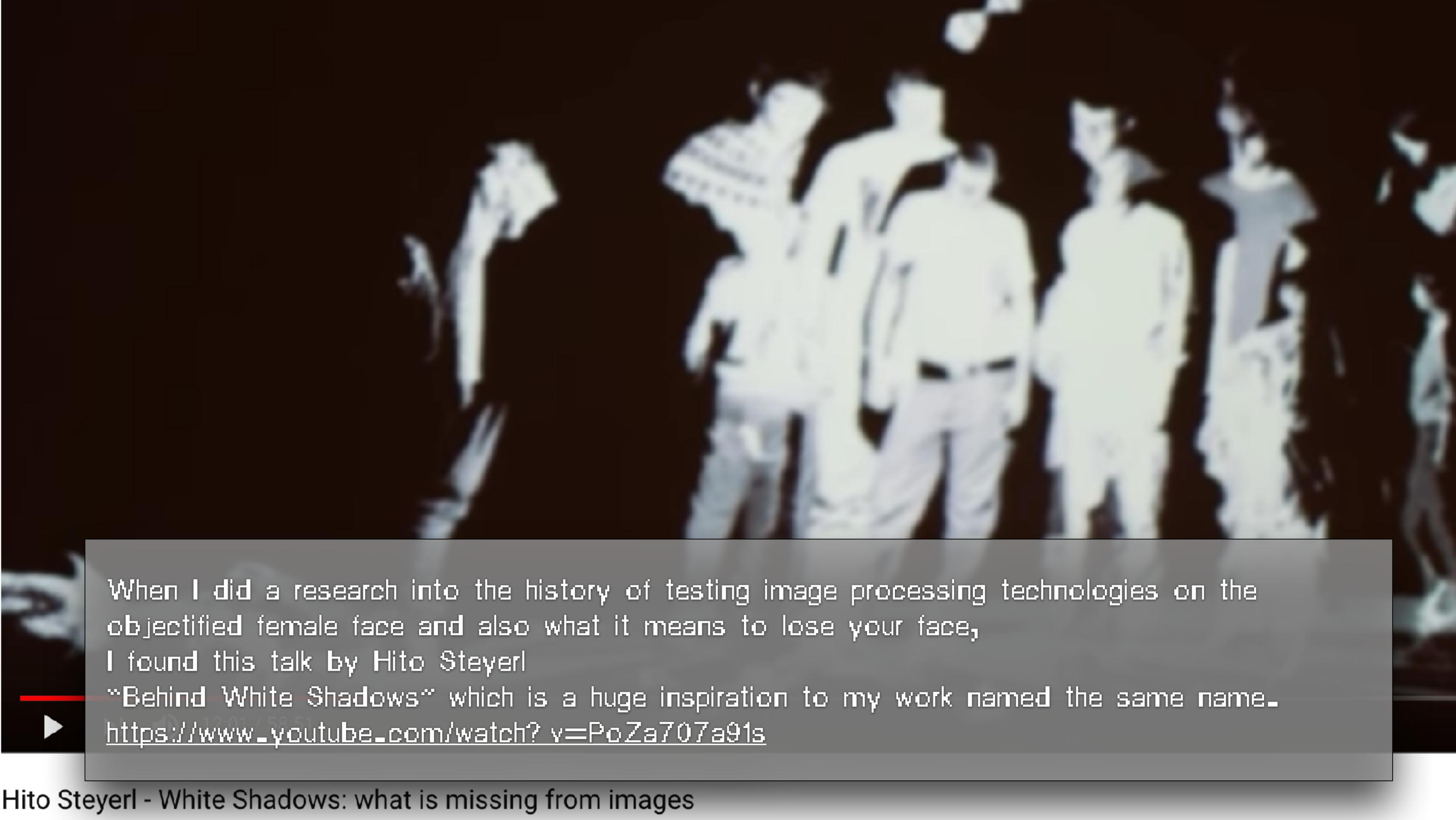
I DECIDED THAT I  
WOULD LIKE 1 good.

Daniel J. Sandin  
Department of Art  
University of Illinois at Chicago Circle  
Box 4348  
Chicago, Illinois 60680  
Office phone: 312-996-8689  
Lab phone: 312-996-2312  
Messages: 312-996-3337 (Department of Art)

TAPE FROM  
EACH COPY  
of THE

Dan Sandin: Distribution Religion, 1971 - 1973.

I. P.



When I did a research into the history of testing image processing technologies on the objectified female face and also what it means to lose your face, I found this talk by Hito Steyerl "Behind White Shadows" which is a huge inspiration to my work named the same name. <https://www.youtube.com/watch?v=PoZa707a91s>



## Behind the White Shadows of Image Processing: Shirley, Lena, Jennifer and the Angel of History.<sup>1</sup>

<sup>1</sup> This chapter is based on a talk I gave during Elevate Festival 2016 (Graz, Austria), for which I was kindly invited by Nora o'Marca. I would also like to extend my gratitude to Bogomir Doringier for inviting me to present my story and research as part of his Faceless panel during Besonate 2017 (Belgrade, Serbia) and last, but not least, to Ward Jansen who has been a driving force behind the joint acquisition of a Vernacular of File Formats by the Stedelijk Museum Amsterdam and Moti in 2016, which initiated my thinking on topics covered in this paper.

In her 2012 White Shadows: what is missing from images lecture at the Gdansk Academy of Fine Arts in Poland, Hito Steyerl speaks about how new technologies force us to reformulate important questions about the making visible, capturing, and documenting of information. In the first part of her talk, Steyerl focuses on the use of 3D scanning in forensic crime scene investigations. Steyerl explains how the 3D scanner, or LiDAR technology (Light Detection And Ranging), sends laser beams that reflect off of the surfaces of the objects that are being scanned. In this process, each point in space is measured and finally compiled as a 3D facsimile point cloud of a space. Steyerl states that this kind of capturing does not just provide a completely new image of reality or possibility for capturing the 'truth'. In fact, she takes issue with the general belief that this type of new technology should be described as the ultimate documentary, forensic tool; a tool that produces 100% reliable, true evidence.<sup>1</sup>

Just like any other technology, Steyerl argues, VR has its affordances, and with these affordances come blind spots: for instance, only a few scanning rigs are advanced enough to capture a moving object. Generally, a moving object becomes a blur or is not picked up at all. A "2.5D" scanning rig (a rig with just one 3D scanner that scans a space) can only provide the surface data of one side of the scanned object space. As a result, the final scan of an object or space includes blind spots: the back of the objects or shadows cast by objects in front of an object which, depending on the displaying technology, sometimes show up as an empty, white shell.

"What becomes visible on the back of the image is the space that is not captured. The space that is missing, missing data, the space where an object covers the view. A shadow. [...] Documentary truth and evidence also [ed. *Rosa*: includes] the missing of information. The missing people themselves."<sup>2</sup>

To really scan an environment properly, the scanning would have to be done from every angle. But in the case of most 3D scanning, certain elements of the scanned environment will always exist in the shadow of the next object and result in white patches, blank spaces or hollowed out shells, remaining in the dataset only as a log of the scanner's unseen, unregistered space. An important question then—not just for 3D, but for any technology—is: who decides the point of view, and who stands behind the perspective from which the LiDAR—or any scanning or imaging technology—is operated? *Who* is casting these white shadows? In order to formulate a possible start to an answer for these questions, what follows is a history of resolutions, specifically the history of the color test card.



<sup>1</sup>Normal Caucasian Shirley cards

<sup>2</sup>Steyerl, Hito (2012)

I published my research here:  
<https://beyondresolution.info/Behind-White-Shadows>

INVENTING PRIVACY THROUGH  
SUBVERSIVE MEDIA STRATEGIES

# FACELESS

BOGOMIR DORINGER

BRIGITTE FELDERER

(EDS.)

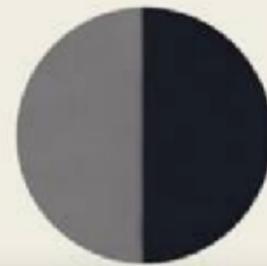
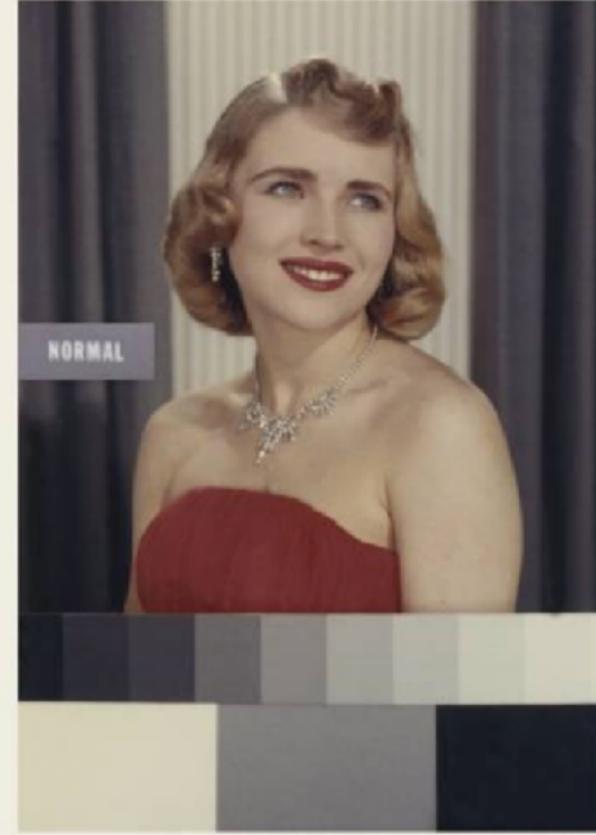
**LORNA ROTH**



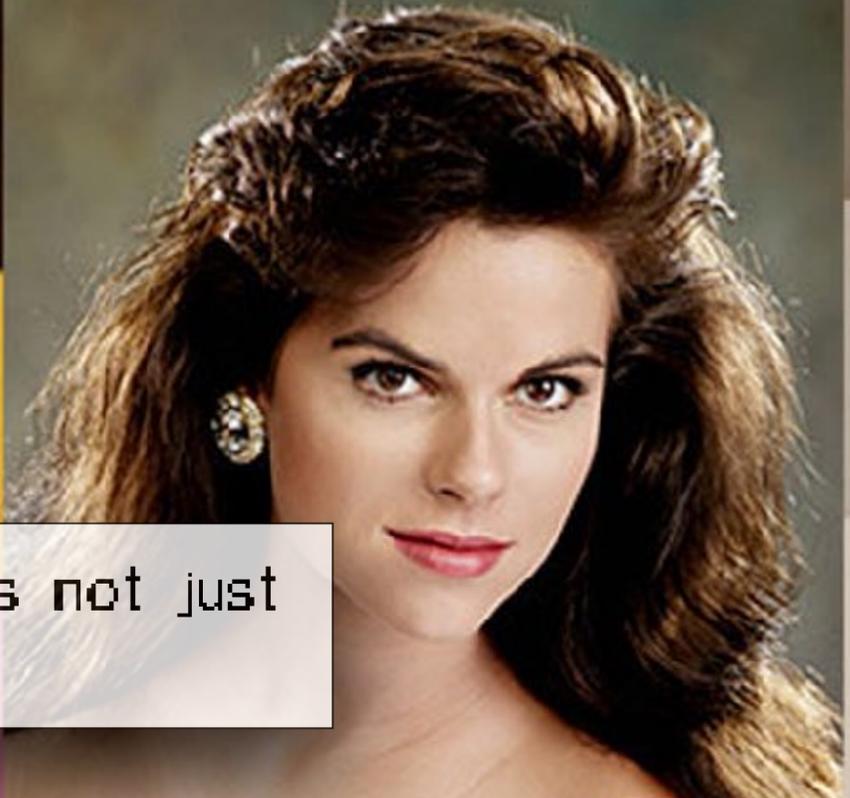
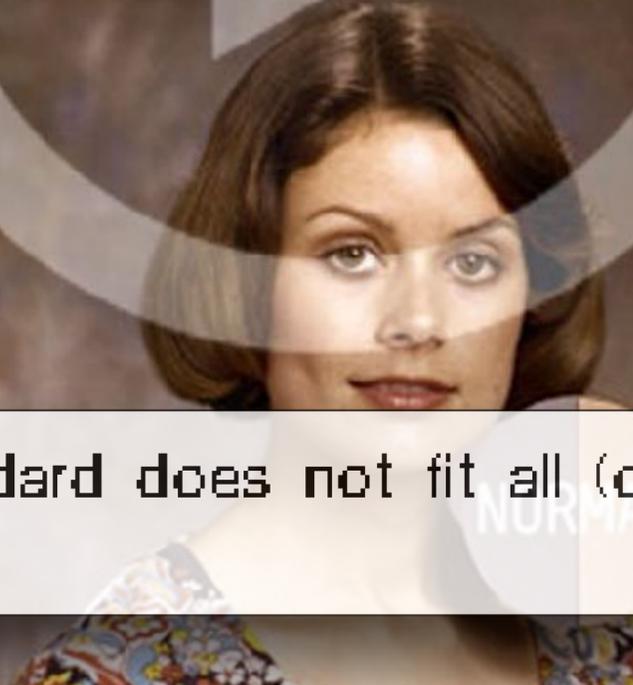
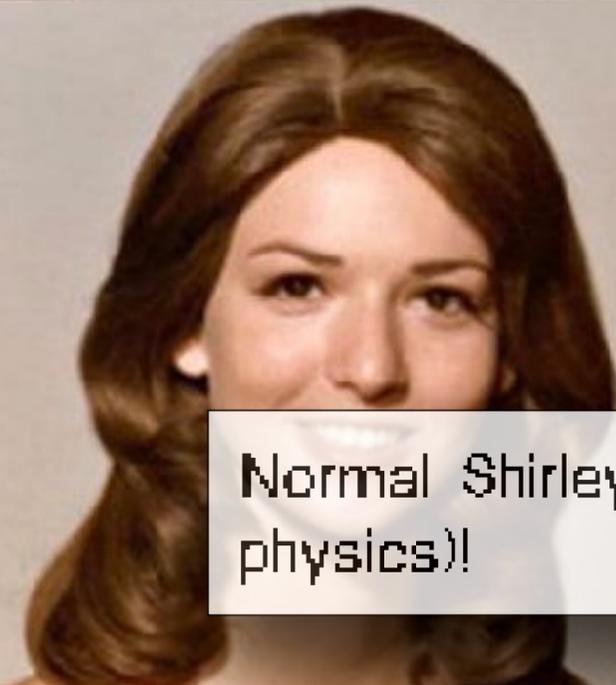
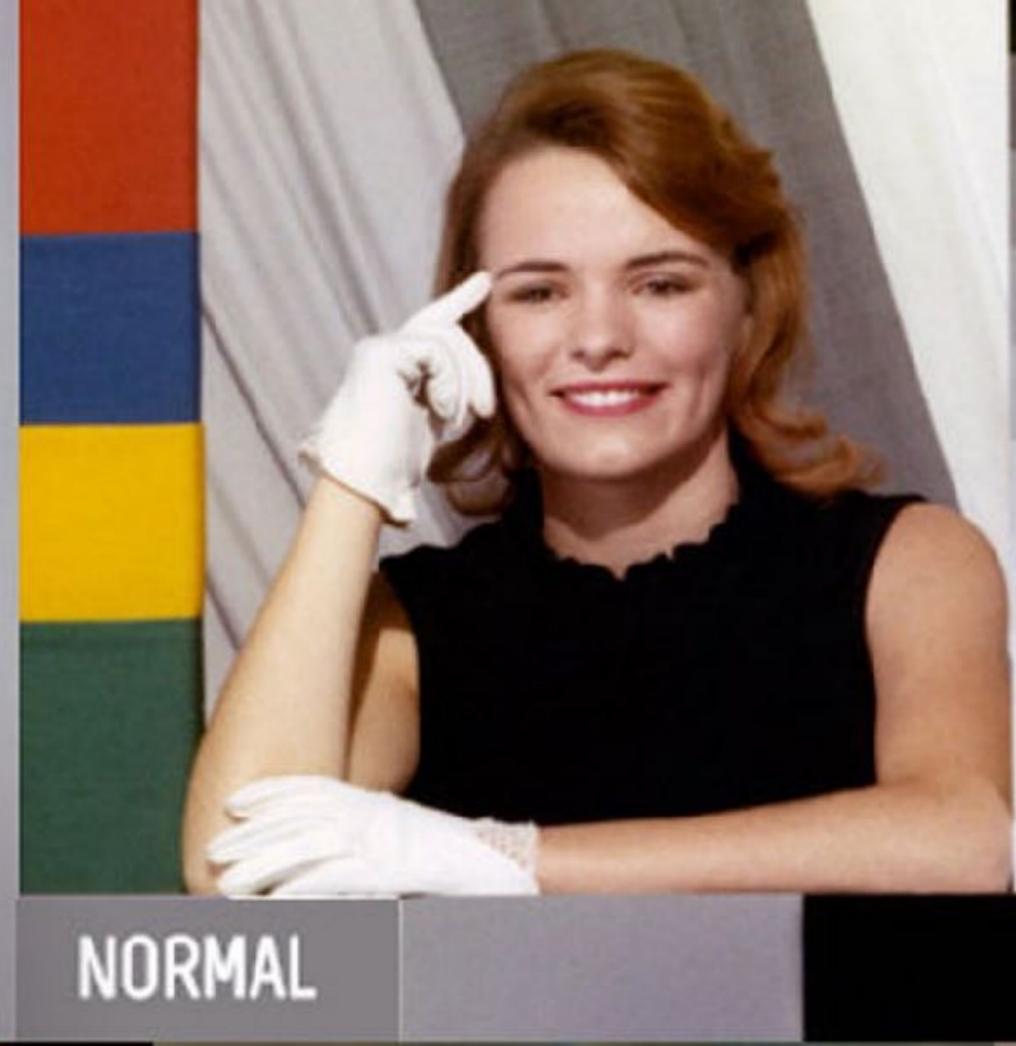
**Concordia University, Montreal**

Vox / Lorna Roth. Color film was built for white people. Here's what it did to dark skin. 2015.  
<https://www.youtube.com/watch?v=d16LNHIEJzs>

# To photograph the details of a dark horse in low light



Or to find new clientele in the wood and chocolate industry.



Normal Shirley card: One standard does not fit all (or: physics is not just physics)!



NBC's Miss "Color TV" Marie McNamara in the 1950s.



Playboy's July 1960 Playmate Teddi Smith



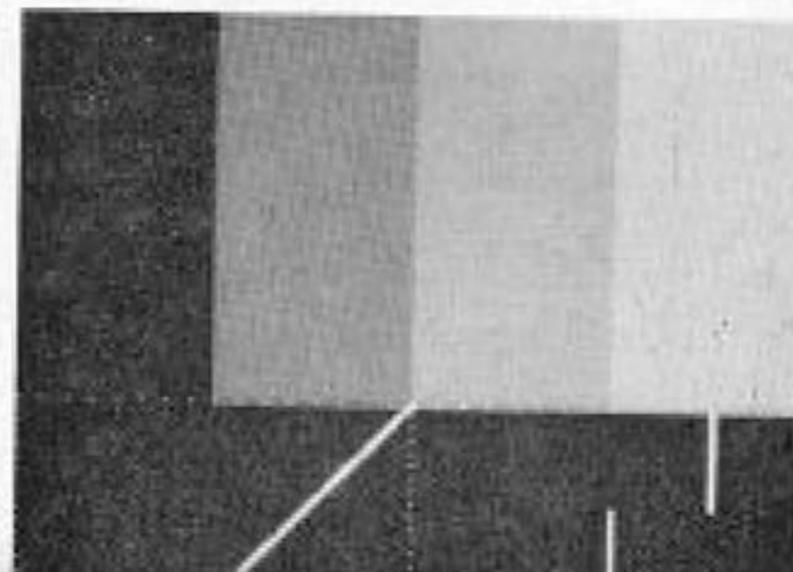
Four Bit



Three Bit

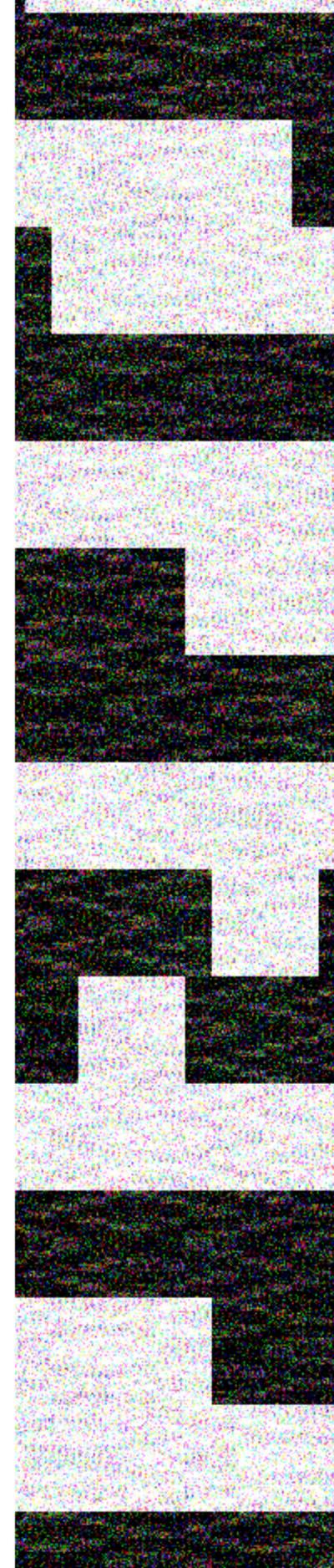


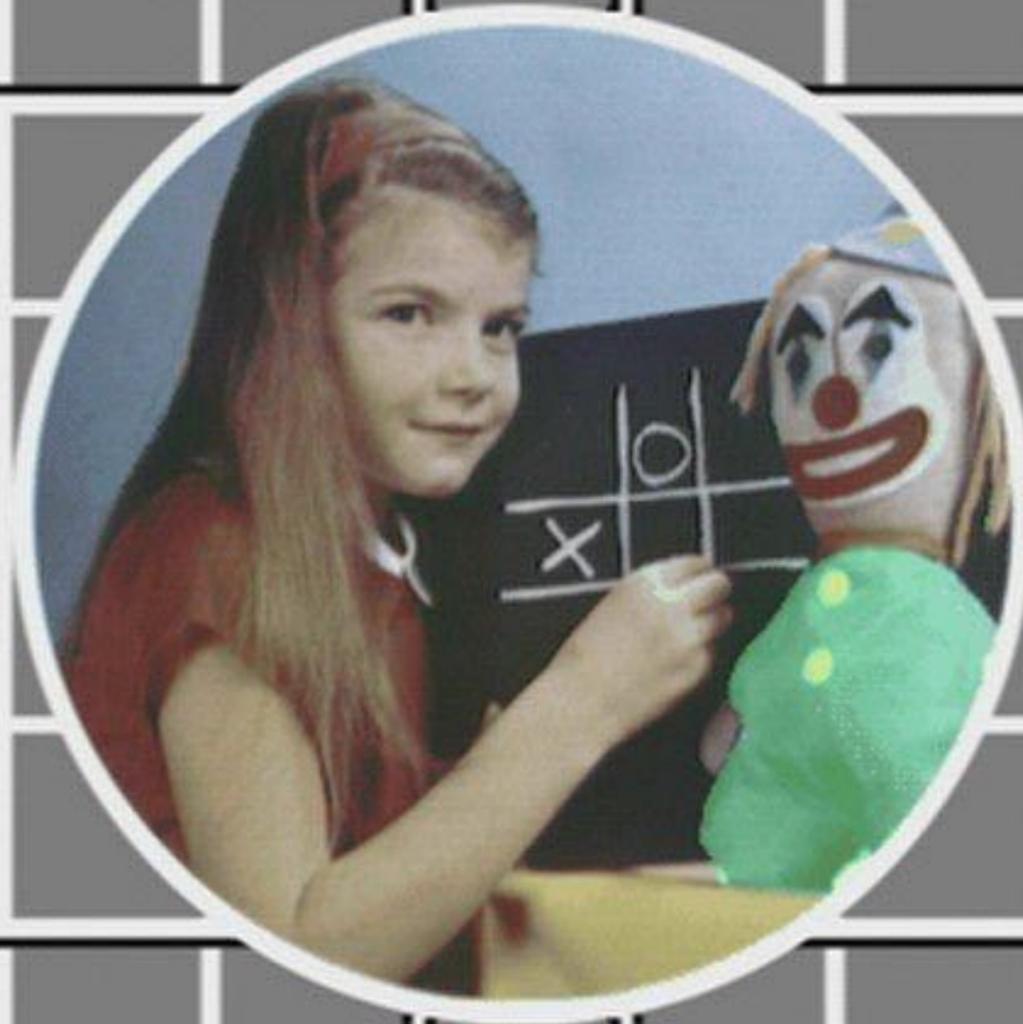
Two Bit



Two-Bit Gray Scale

1961, when Lawrence G. Roberts used two cropped 6-bit grayscale scanned images from Playboy's July 1960 issue, featuring Playmate Teddi Smith, in his MIT master's thesis on image dithering





F

© BBC, ITC & BREMA 1967

BBC Research & Development Department

Carole Hersee Test Card F. 1967 - 1998.



Kodak LAD Girl, or Laboratory Aim Density Card, developed by John Pytlak between 1974-1982.

# LAD for KODAK VISION Color Print Film

## Black Patch

Appears neutral and black, but has lower density than the black background behind the model.

## White Patch

Appears neutral, with density noticeably greater than D-min (clear frameline) of print film.

## Black Background

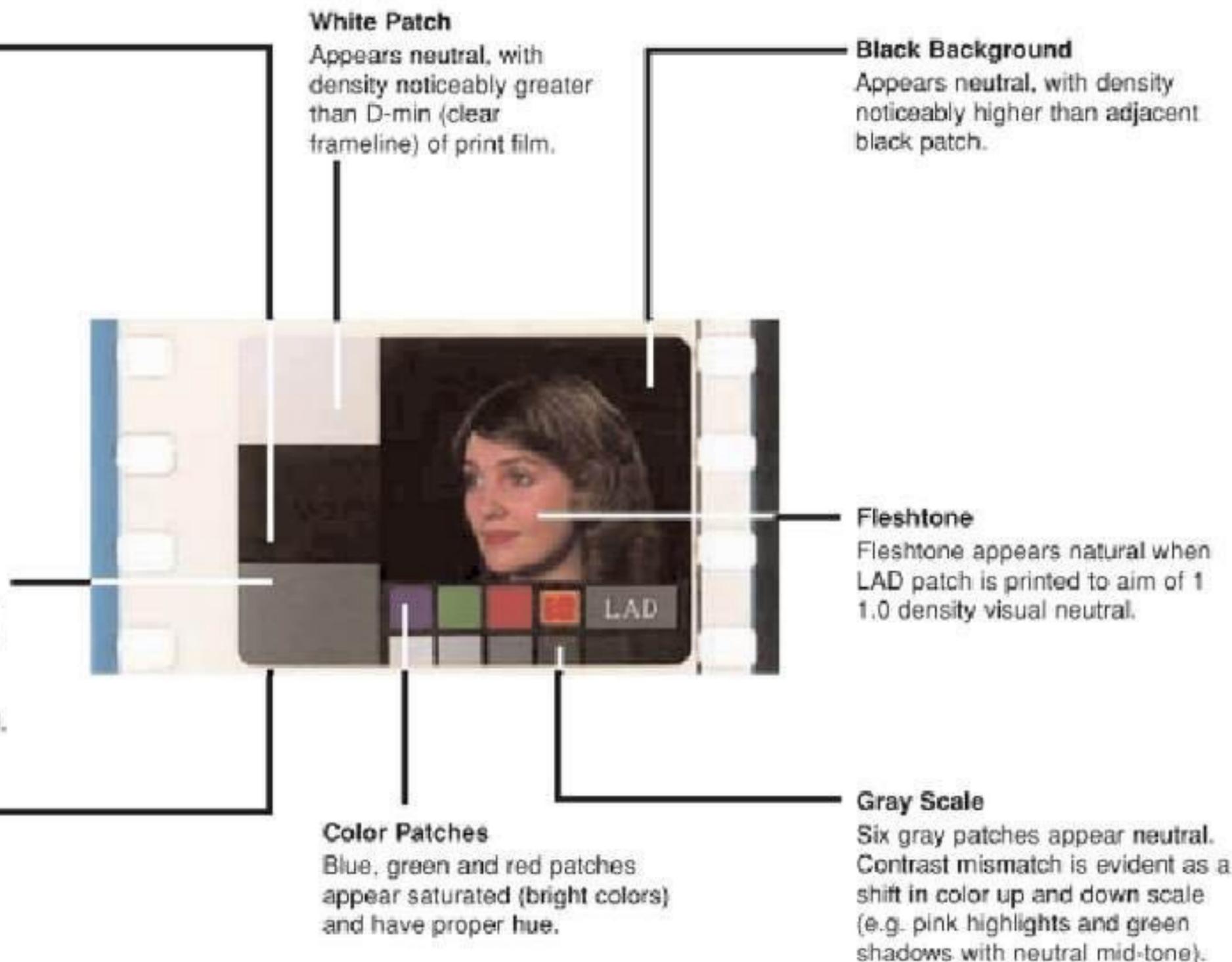
Appears neutral, with density noticeably higher than adjacent black patch.

## LAD Patch

Appears neutral gray, with visual density of 1.0. On KODAK VISION Color Print Film 2383/3383 or KODAK VISION Premier Color Print Film 2393/3393, the **Status A density aim** is 1.09 red, 1.06 green, and 1.03 blue. Other films may have different Status A densities to obtain a 1.0 density visual neutral.

## Frameline

Continuous contact print of the LAD standard patch has a clear (D-min) frameline. Any coloration is due to safelight fogging or process stain.



## Fleshtone

Fleshtone appears natural when LAD patch is printed to aim of 1 1.0 density visual neutral.

## Color Patches

Blue, green and red patches appear saturated (bright colors) and have proper hue.

## Gray Scale

Six gray patches appear neutral. Contrast mismatch is evident as a shift in color up and down scale (e.g. pink highlights and green shadows with neutral mid-tone).



John Pytlak posing with the Kodak LAD Girl.  
Have your highlights lost their sparkle?  
And the midtones lost their scale?  
Are your shadows going smokey?  
And the colors turning stale?  
Have you lost a little business to labs whose pictures shine?  
Because to do it right - takes a lot of time.  
Well, here's a brand new system.  
It's simple as can be! Its name is LAD  
- an acronym for Laboratory Aim Density. - John P. Pytlak, 1982.

**Kodak**

Official Film  
of the 1992  
Olympic Games



Kodak True Colors commercial, 1991.  
<https://www.youtube.com/watch?v=Y3LTpPcvsJw>



Kodak's multiracial Shirley card from 1996.

Jeff Seideman

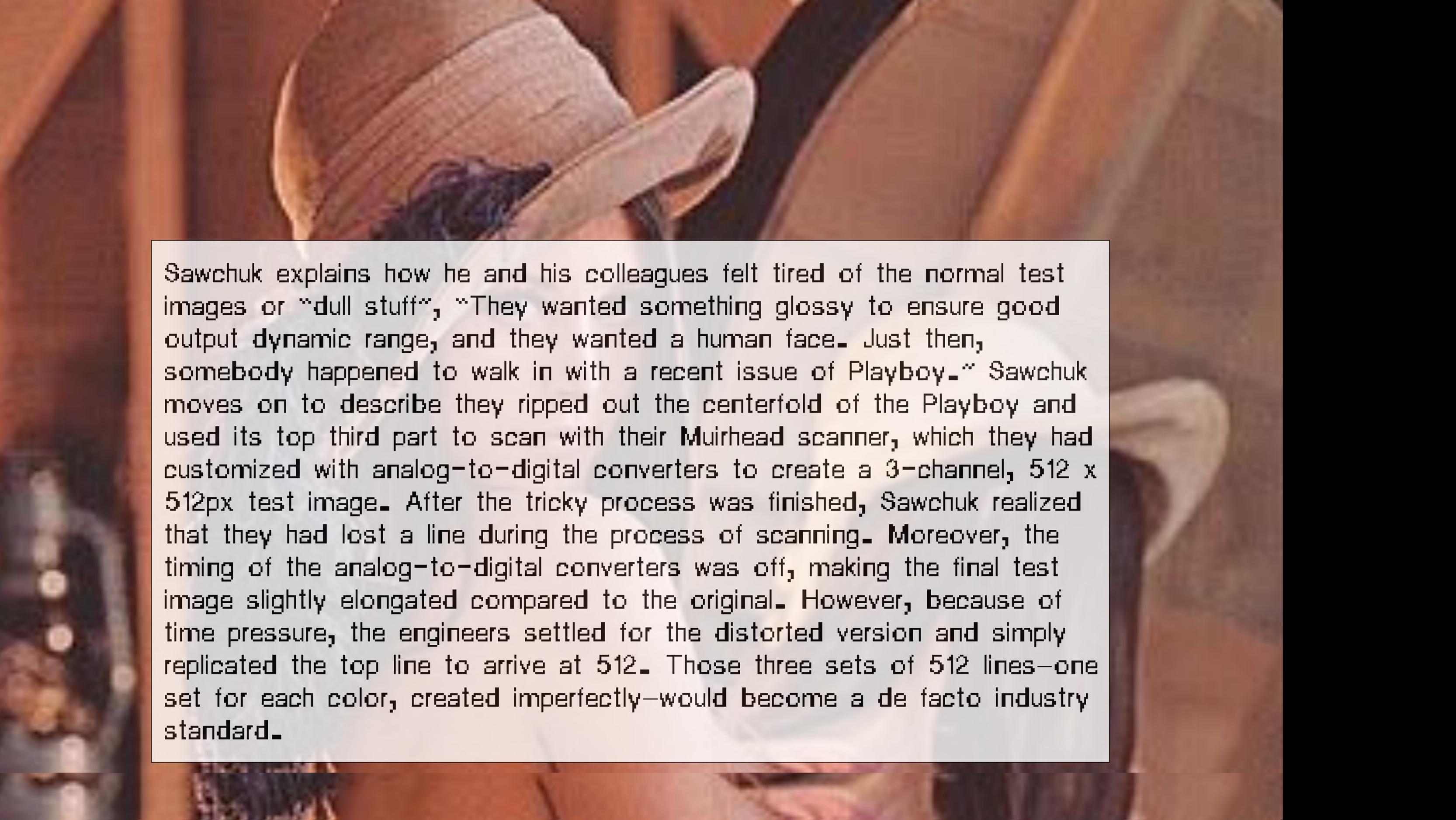
**“When you use a picture like that for so long, it’s not a person anymore; it’s just pixels.”**

Lena Soderberg. Playboy centerfold 1972.

Unbeknownst to Lena (and, for many years, Playboy), her Playboy centerfold quickly became the single most used picture in image-processing research. Lena was even one of the first pictures uploaded to ARPANET.

Lena was used to develop the now-ubiquitous .JPEG image format. “We decided we should exploit this, because it is a phenomenon.” – Eileen Kent, VP of new media at Playboy



A close-up photograph of a person's hand holding a light-colored, textured hat against a dark background. The hat has a wide brim and a dark band. The person's hand is visible, wearing a dark sleeve. The background is dark and out of focus.

Sawchuk explains how he and his colleagues felt tired of the normal test images or “dull stuff”, “They wanted something glossy to ensure good output dynamic range, and they wanted a human face. Just then, somebody happened to walk in with a recent issue of Playboy.” Sawchuk moves on to describe they ripped out the centerfold of the Playboy and used its top third part to scan with their Muirhead scanner, which they had customized with analog-to-digital converters to create a 3-channel, 512 x 512px test image. After the tricky process was finished, Sawchuk realized that they had lost a line during the process of scanning. Moreover, the timing of the analog-to-digital converters was off, making the final test image slightly elongated compared to the original. However, because of time pressure, the engineers settled for the distorted version and simply replicated the top line to arrive at 512. Those three sets of 512 lines—one set for each color, created imperfectly—would become a de facto industry standard.



Fig. 12. Multiscale doubling.

Compression Ratio	8:1	10:1	32:1	64:1
pSNR	27.6	21.1	20.2	22.1
(5,3) tap scalar QMF	18.0	34.9	31.3	23.41
Daubechies 4	19.5	34.3	31.3	28.5
GHM with approx./denoise	18.8	34.7	31.5	28.1
Chui-Lian with approx./denoise	15.3	31.1	27.9	25.5
constrained pair #1	14.4	31.4	27.2	24.2
constrained pair #2				

operates by transforming the data to remove redundancy, then quantizing the transform coefficients (a lossy step), and finally entropy coding the quantizer output. Because of their energy compaction properties and correspondence with the human visual system, wavelet representations have produced superior objective and subjective results in image compression [2], [5], [26], [47]. Since a wavelet basis consists of functions with short support for high frequencies and long support for low frequencies, large smooth areas of an image may be represented with very few bits, and detail added where it is needed. Multiwavelet decompositions offer all of these traditional advantages of wavelets, as well as the combination

of orthogonality, short support, and symmetry. The short support of multiwavelet filters limits ringing artifacts due to subsequent quantization. Symmetry of the filterbank not only leads to efficient boundary handling, it also preserves centers of mass, lessening the blurring of fine-scale features. Orthogonality is useful because it means that rate-distortion optimal quantization strategies may be employed in the transform domain and still lead to optimal time-domain quantization, at least when error is measured in a mean-square sense. Thus it is natural to consider the use of multiwavelets in a transform-based image code.

We employed a production image coder to compare the 2-D multiwavelet algorithms of Section V with two scalar wavelets: the Daubechies four-tap orthogonal wavelet and the (5, 3) tap symmetric QMF of Lo-Gill and Thirabasi. Five types of wavelet transform were used:

- (3, 3)-tap scalar wavelet;
- $D_4$  scalar wavelet;
- approximation-based preprocessing with GHM multiwavelets;
- approximation-based preprocessing with Chui-Lian multiwavelets;



Fig. 3. Noisy Lena image, SNR = 2.2 dB.



Fig. 5. BPNN-based edge adaptive RUKF processed image, SNR = 10.7 dB.



Fig. 4. MAP-based edge adaptive RUKF processed image, SNR = 9.7 dB.



Fig. 6. Standard RUKF processed image, SNR = 6.2 dB.

blurring artifacts. A standard RUKF with the same region of support was also applied to the noisy test image. In this case, the AR model coefficients were obtained using the Yule-Walker method [4]. The coefficients of this model were estimated to be  $c_{1,0} = 0.5483$ ,  $c_{1,1} = 0.1905$ ,  $c_{0,1} = 0.6390$ ,  $c_{0,2} = -0.7535$ , and the variance of the driving process was  $\sigma^2 = 11.5962$ . The processed image for this case is shown in Fig. 6. As can be seen, the BPNN-based edge adaptive RUKF provides 2.5 dB SNR improvement over the standard RUKF filter.

Fig. 7 shows the performance comparison of the BPNN and MAP-based edge adaptive Kalman filtering schemes for different SNR values of the original image namely 1, 5.2, 10, 20, 30, and 40 dB. The upper curve corresponds to the BPNN-based method. As can be observed from these operating characteristic plots, the BPNN-based adaptive Kalman filter provides better SNR improvement, especially at lower SNR. This is due to the fact that the training set used to train the BPNN consisted of several noisy edge patterns. Consequently, this

leads to better generalization and thus better noise tolerance of this scheme over the MAP-based method.

Finally, to study the relationship between the number of classes, and SNR performance improvement several experiments were conducted. Table II gives the results of the BPNN-based edge adaptive Kalman filter using different edge dependent RUKFs. The first five cases in this table correspond to a single class case where only one edge dependent RUKF is used to process the image. In these cases, the highest SNR was obtained for a nonedge case. The reason being the nonedge regions form most of the image, with edge blocks making up only a small part of the whole image. For the sixth case in the table, three edge classes namely 0, 90° and nonedge were allowed leading to a bank of three RUKFs. The SNR of the resultant image for this case was only 0.22 dB better than the nonedge case. This slight improvement is due to the addition of the two edge directions, i.e., 0, 90°. When the number of classes increased from three to five, an additional 0.05 dB improvement was achieved as evident from the

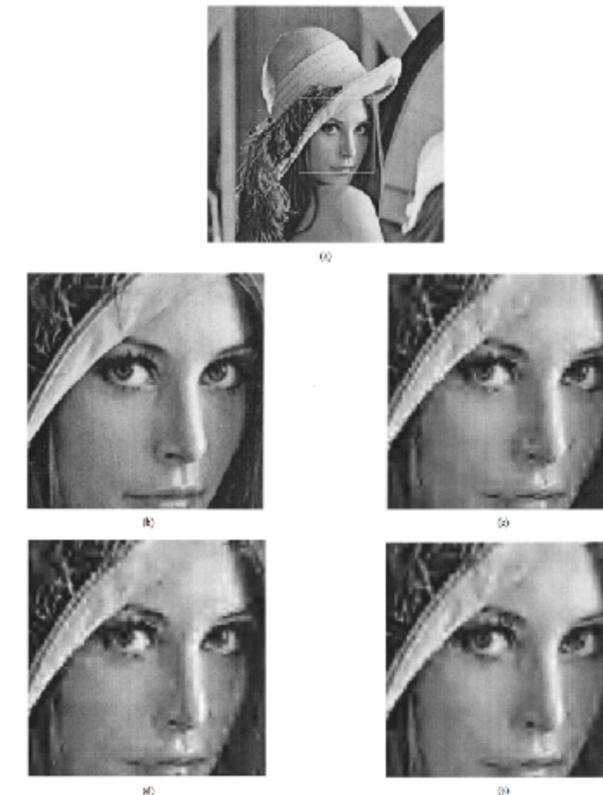


Fig. 7. Comparison of three subband coding schemes. Lena  $512 \times 512$  (8 bits/pixel, bit rate 6.2 bits/pixel, pyramidal decomposition up to resolution  $2^{11}$ ). The white noise represents the region under consideration. (c) Original image region. (d) Local subband coding. (e) Subband coding using globally registered subbands. (f) Subband coding using registered subbands in each resolution level.

of 10 (related to the size of the codebook and the lattice type) is allowed using the Barnichaudin and Vetterli algorithm [8]. First we take the Daubechies orthogonal filter of length 104. The PSNR of the three approaches is presented in Fig. 5. We can note that the

results of globally registered subbands are better than those of the usual subbands and the PSNR of the decompressed images using registered subbands at each resolution level is the best. In addition, Fig. 6 shows that the two proposed approaches reduce significantly the

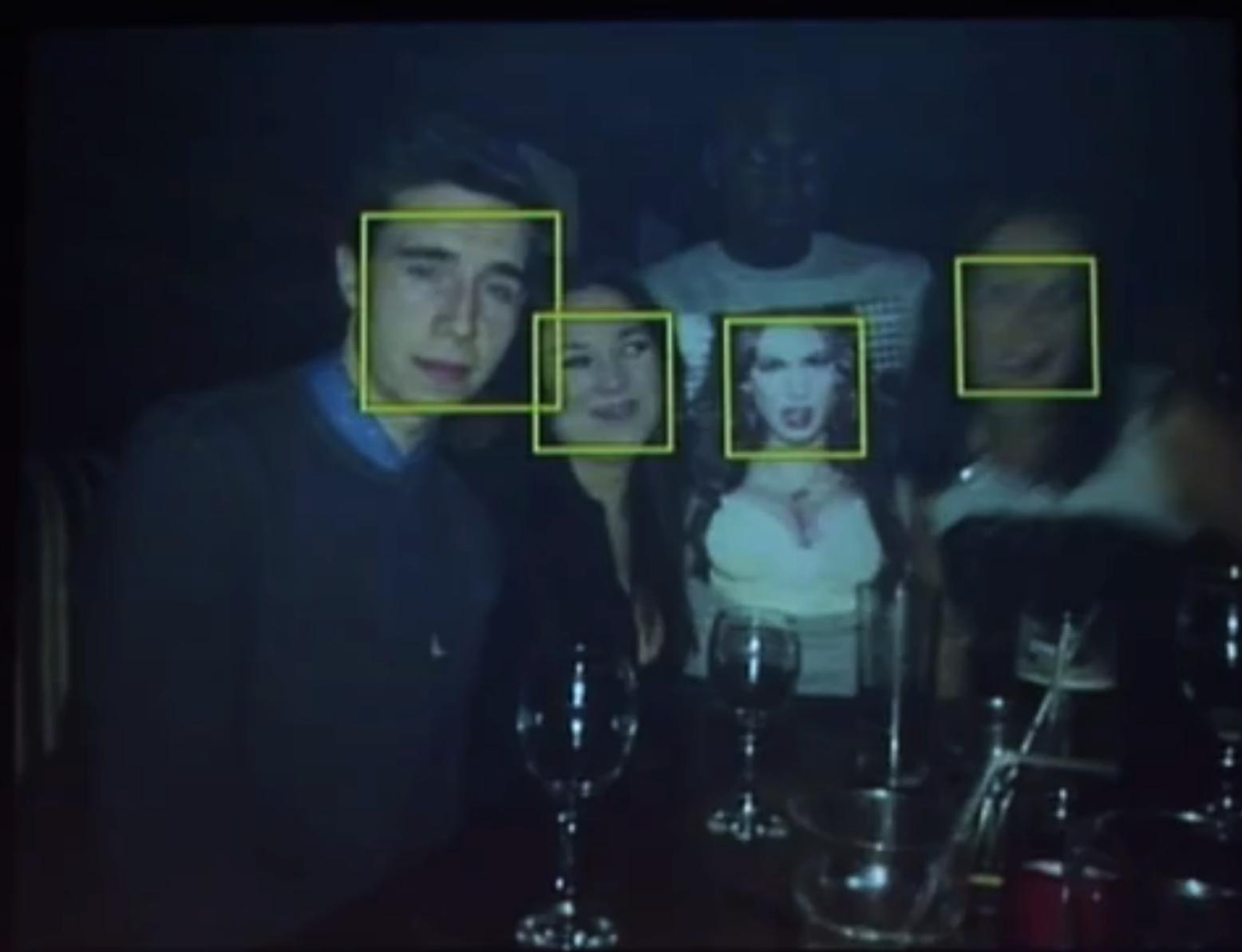
In a 1999 issue of IEEE Transactions on Image Processing "Lena" was used in three separate articles



What would it have meant for standardization of digital image processing if the image chosen for the JPEG color test card would have for instance featured the first African-American Playboy centrefold Jennifer Jackson (March 1965)



Or if the creators of the color test card would not have objectified the naked female body at all, but instead had asked permission to feature and honour for instance Christine Darden, African American researcher at NASA, pioneering supersonic aircrafts.

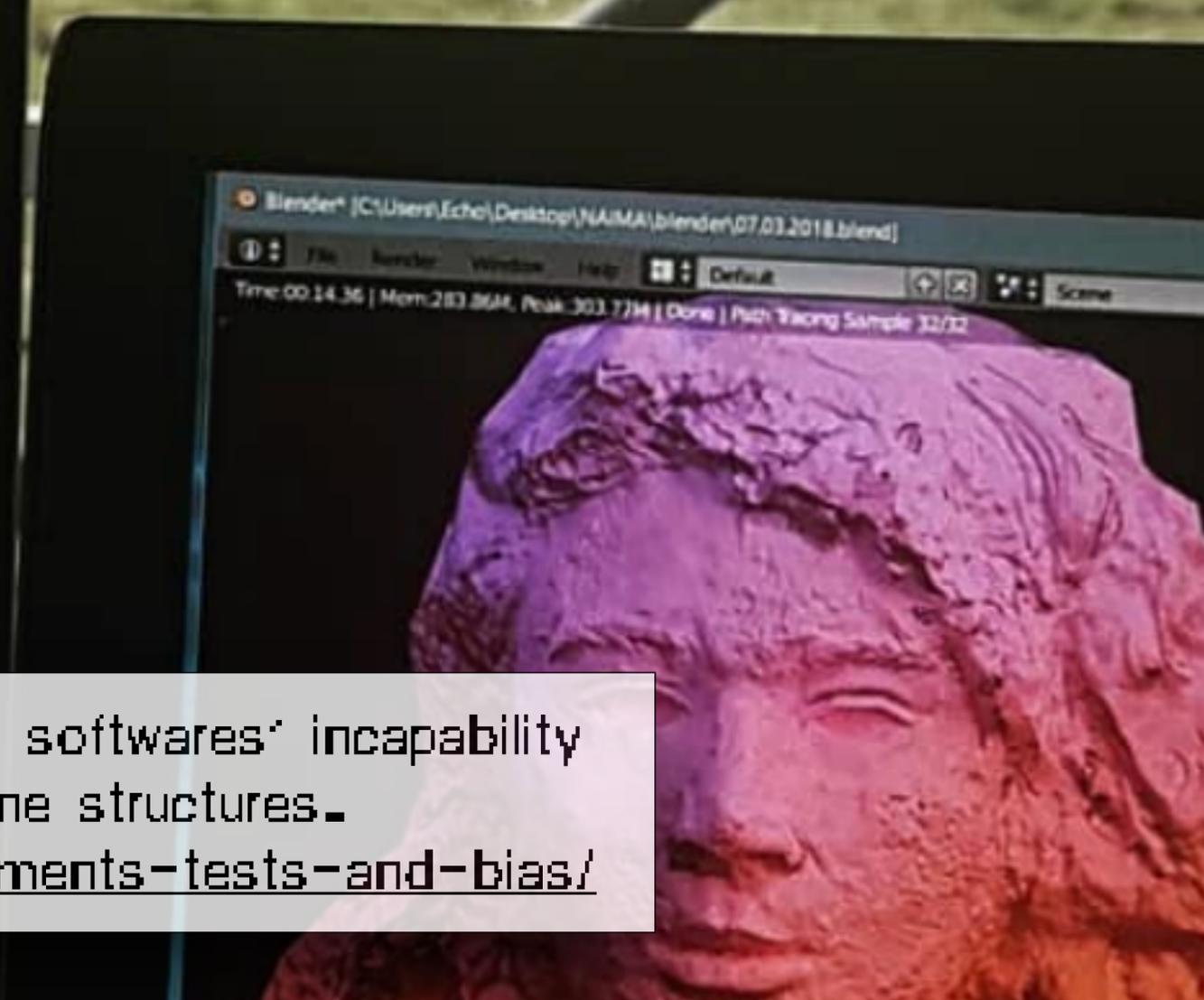


POSTED ON LITTLEFUN.ORG

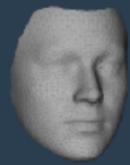
Unfortunately the producers of image processing test cards made such changes, and as a result, bias is still encoded even in contemporary facial recognition softwares. Such as facial recognition software that does not  
Image from: Zach Blas, Bio Exempt lecture at Sonic Acts, 2017.  
<https://www.youtube.com/watch?v=V6eE62zJpbo>



Zach Blas gave a wonderful overview of contemporary bias in digital image technologies in his lecture 'Bio Exempt' at Sonic Acts, 2017.

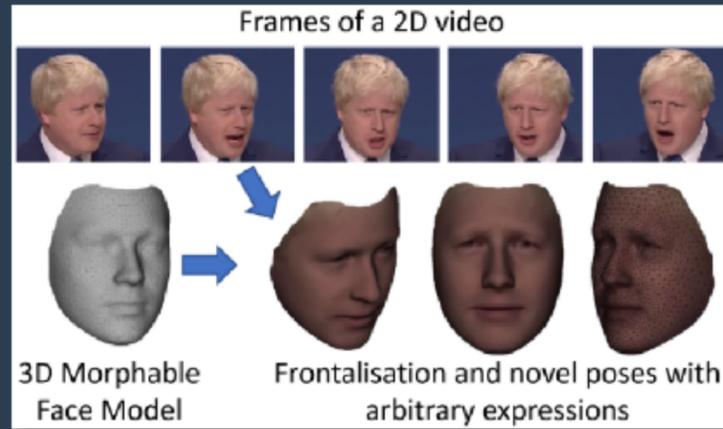


Echo Can Luo: Nicely Nicely all the time, 2018. A survey of VR softwares' incapability to automatically capture and generate 3D models with Asian bone structures.  
<http://echocanluo.com/face-tracking-and-3d3d-modeling-experiments-tests-and-bias/>



# 4DFace

Real-time 3D face tracking and reconstruction from 2D video



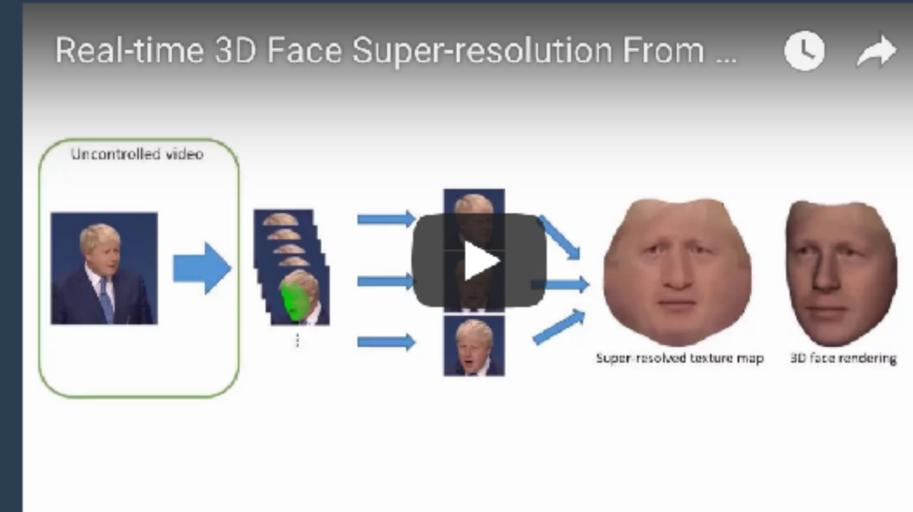
Source code

Coming soon:

Windows (64 bit .exe)

Linux (.deb)

Android (play store)



## Key features

- Tracks and reconstructs a face in 3D from 2D video
- Semi-dense 3D shape reconstruction
- Expression fitting
- Functionality available as header-only, modern C++11/14 library ([GitHub](#))

## Download

- Use above links to download a pre-built executable (coming soon), or fork the source code on GitHub.

## Publications

- **Real-time 3D Face Super-resolution From Monocular In-the-wild Videos**

P. Huber, W. Christmas, M. Räscher, A. Hilton, J. Kittler

ACM SIGGRAPH 2016 Posters, 2016, Anaheim, United States

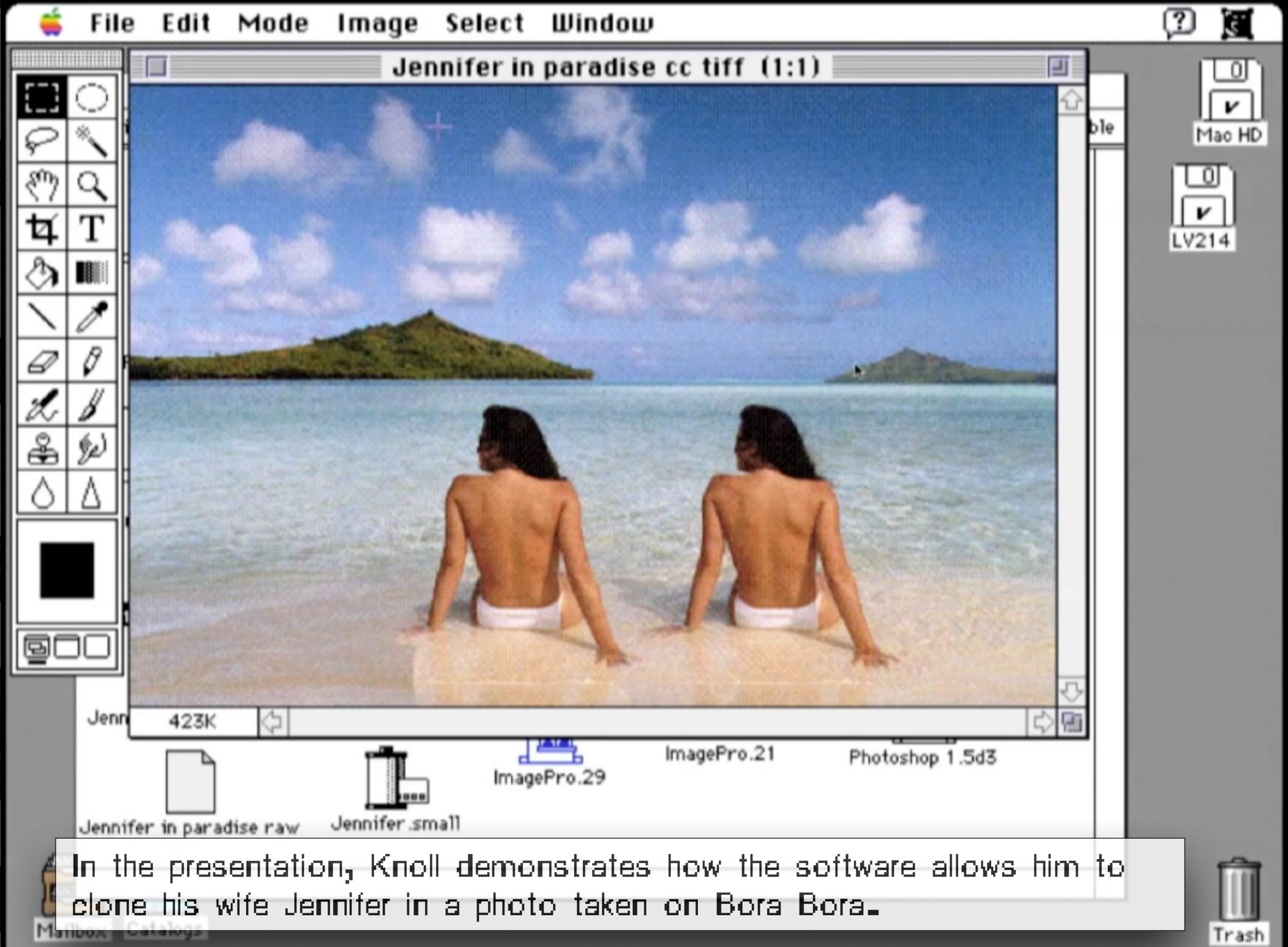
[\[ACM\]](#)[\[Abstract \(PDF\)\]](#)[\[Poster \(PDF\)\]](#)

Echo Can Luo: Nicely Nicely all the time, 2018. A survey of VR softwares' incapability to model Asian bone structures.

A Multi-resolution 3D Morphable Face Model and Fitting Framework  
P. Huber, G. Hu, K. Tena, F. Mohtazaviani, V. Köpper, W. Christmas, M. Räscher, J. Kittler  
IEEE Transactions on Visualization and Computer Graphics, 2018, 24(11):3113-3126, Italy  
[\[SCITEPRESS\]](#)[\[PDF\]](#)



John Knoll presenting Photoshop image processing software.  
<https://slate.com/technology/2014/06/jennifer-in-paradise-taken-by-john-knoll-in-1987-was-the-first-digital-image-manipulated-in-photoshop.html>



In the presentation, Knoll demonstrates how the software allows him to clone his wife Jennifer in a photo taken on Bora Bora.

----- Forwarded message -----

From: **John Knoll**  
Date: Wednesday, December 11, 2013  
Subject: Re: John Knoll inquiry/WSJ  
To: "[ellen.gamerman@wsj.com](mailto:ellen.gamerman@wsj.com)" <[ellen.gamerman@wsj.com](mailto:ellen.gamerman@wsj.com)>  
Cc: Russell Preston Brown <[brown@adobe.com](mailto:brown@adobe.com)>, "[info@futuregallery.org](mailto:info@futuregallery.org)" <[info@futuregallery.org](mailto:info@futuregallery.org)>

Hi Ellen,

If you're fact checking the story told here:

<http://futuregallery.org/past/constant-dullaart-jennifer-in-paradise/>

Where he states:

> [1] Jennifer in Paradise is the name of the first picture ever to be photoshopped. Taken by John Knoll, co-creator – along with his brother Thomas – of the now ubiquitous software, it depicts his girlfriend on a tropical beach. The image was digitized by Kodak in 1987 and supplied with early versions of the program. Though initially ubiquitous, it has since become harder to track down. For the online component of this exhibition Dullaart is redistributing a version that contains a steganographically encrypted payload.

>

This statement is incorrect in a number of ways. It's ONE of the first images to be photoshopped (and that's the word now). It was the first color photograph I had to work with in Photoshop demos with. It is a photograph I took of my then girlfriend on a tropical beach. I had to work with it the next day. That vacation was a special and treasured memory of mine and that photograph has great emotional significance to me.

About a month later, I was visiting Jim Batson, a friend of mine at the time. He had a 4x6 print of the Jennifer image (with Jim's help) on his Sharp JX-450 flatbed scanner, and I took it home on multiple floppy discs. If I remember right, I saved the red, green and blue channels as separate images on separate floppy discs, and reassembled the "high resolution" 24-bit color image once I got home.

I gave the Jennifer image to some friends at Apple, and a few others who had early copies of Photoshop under NDA as an example image to work with. It was never distributed with Photoshop and I still own the copyright. That's why it's "harder to track down". Nobody has permission to redistribute the image and nobody has asked. As you can see, I'm not that hard to find.

Please let me know if you have any other questions.

-John Knoll

-

Constant Dullaart: an open letter to Jennifer Knoll, 2013.

[https://media.ccc.de/v/32c3-7517-the\\_possibility\\_of\\_an\\_army](https://media.ccc.de/v/32c3-7517-the_possibility_of_an_army)

"Dear Jennifer,

Sometime in 1987, you were sitting on a beach in Bora Bora, looking at To'opua island, enjoying a holiday with a very serious boyfriend. (...) This photograph of a beautiful moment in your personal history has also become a part of my history, and that of many other people: it has even shaped our outlooks on the world at large. John's image of you became the first image to be publicly altered by the most influential image manipulation program ever." (...) In essence, it was the very first photoshop meme—but now the image is nowhere to be found online.

Did John ask you if he could use the image? Did you enjoy seeing yourself on the screen as much as he did? Did you think you would be the muse that would inspire so much contemporary image making? Did you ever print out the image? Would you be willing to share it with me, and so, the other people for whom it took on such an unexpected significance? Shouldn't the Smithsonian have the negative of that image, not to mention digital backups of its endless variations?"

# Jennifer in paradise: the story of the first Photoshopped image

One holiday snap has been manipulated thousands of times on thousands of computers. Here's how a woman on a beach in Bora Bora taught the whole world to tinker with pictures

John Knoll responded again in the Guardian. But where before the image was published under a so called non-disclosure agreement, the real image was now published with the response and as a result, everyone gained access to that original image.

"I still pride myself into tricking Jon into releasing that original image. The world has a right to see this very first photoshopped image." - Constant Dullaart.

Gordon Comstock

Friday 13 June 2014  
17.21 BST



📷 Jennifer in Paradise.tif - the picture Photoshop co-creator John Knoll took of his future wife Jennifer in Bora Bora. Photograph: John Knoll



Constant Dullaart. Jennifer in Paradise, 2013.



Rosa Menkman, Behind White Shadows Patch – logo in glow in the dark on white embroidered in Triangle patch, 2018.

In a culture that is dominated by images, we need to realise that (new) digital image processing technologies – whether based in classic image compression, biometrics or the newest machine learning algorithms – consist of some of the most influential, political but also biased and inherently flawed protocols. We are in a war against the currently governing and still developing states of image processing – whether we know it or not.

# Power Lines

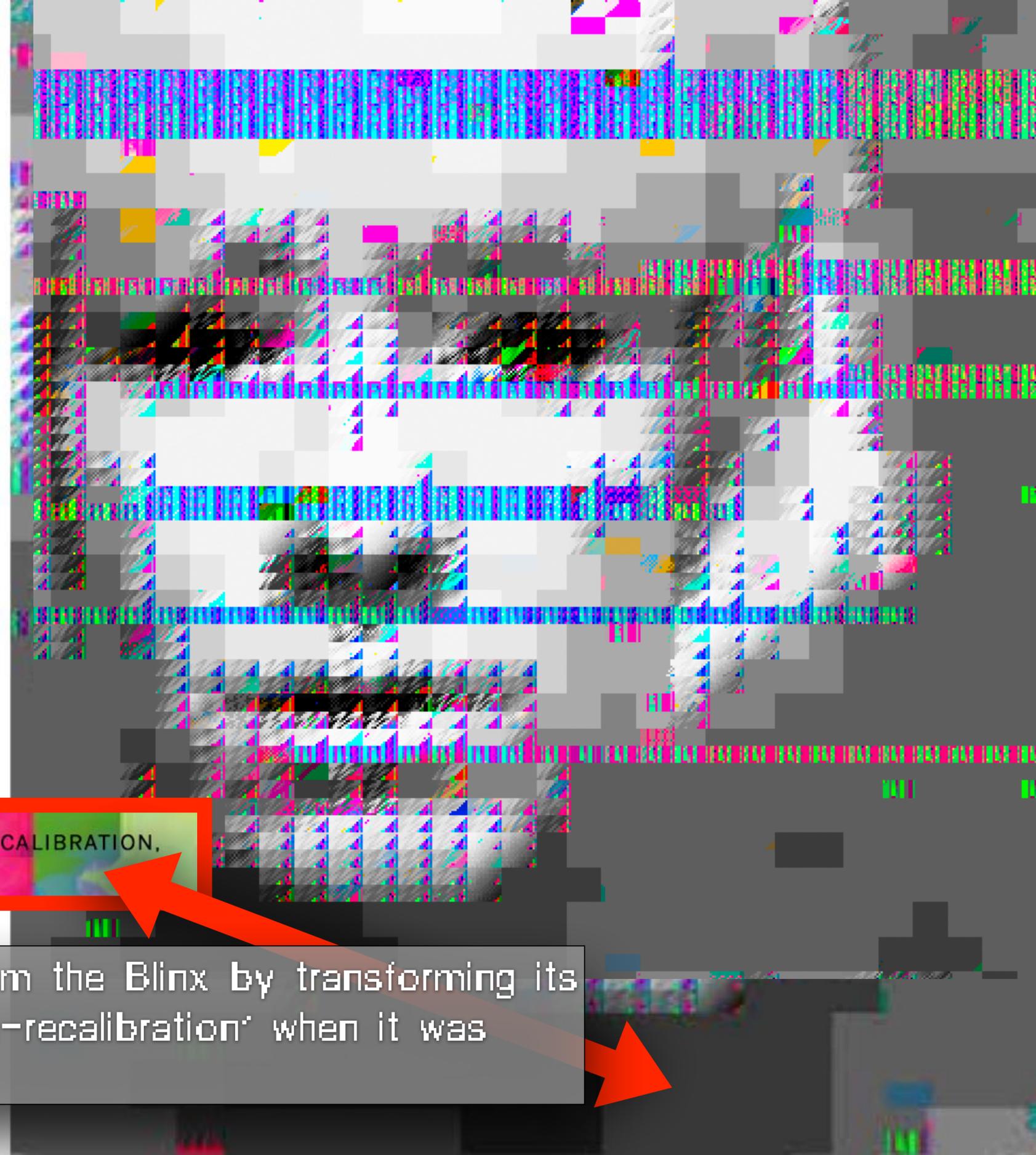
With suggested links to pigmentation and premature aging, is the blue light from our devices the new UV—or just a ray of hype? asks Sarah Brown.

SOON AFTER THE FIRST iPhone came out a decade ago, fashion executive Gigi Mortimer found herself sitting next to an ophthalmologist at a dinner party in Sun Valley, Idaho. “I told him, ‘When you find out the light coming off these screens is bad for us, give me a call,’” she remembers. Mortimer was alarmed by studies that had started trickling out, suggesting the harmful effects of blue light on vision. Scientists

ART: ROSA MENKMAN. A COLOR TEST CARD FOR IMAGE DE-CALIBRATION, BLINX 1, FROM: A VERNACULAR OF FILE FORMATS, 2011.

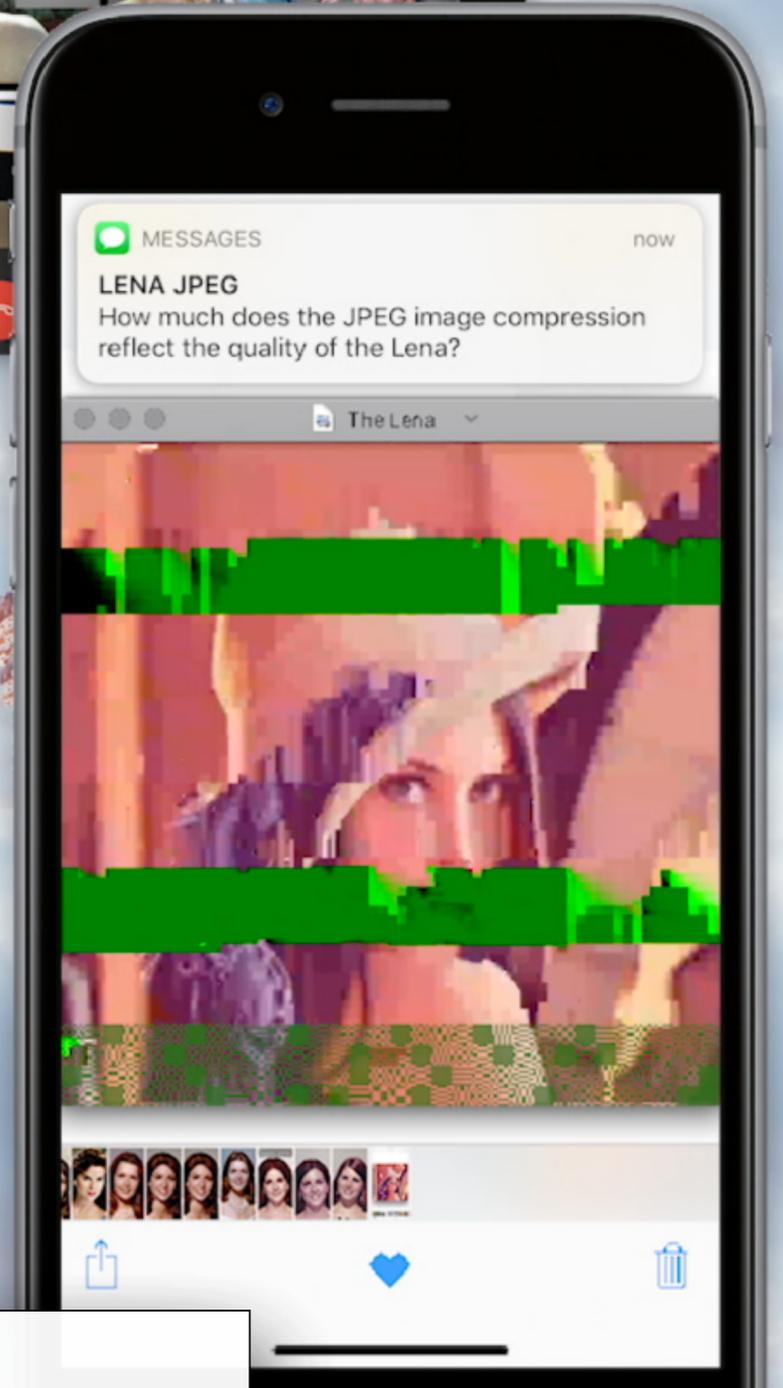
recovery in mice.) Concerned about the potential health risk for her clients, Mortimer started her own company, her start-up was called Blue Light Protection. Mortimer, a former Ralph Lauren executive, set out to create a tempered-glass mobile-phone filter that partially blocks blue light

Rosa Menkman. An effort to re-claim the Blinx by transforming its title to: ‘A color test card for image-recalibration’ when it was featured in VOGUE magazine (2018).



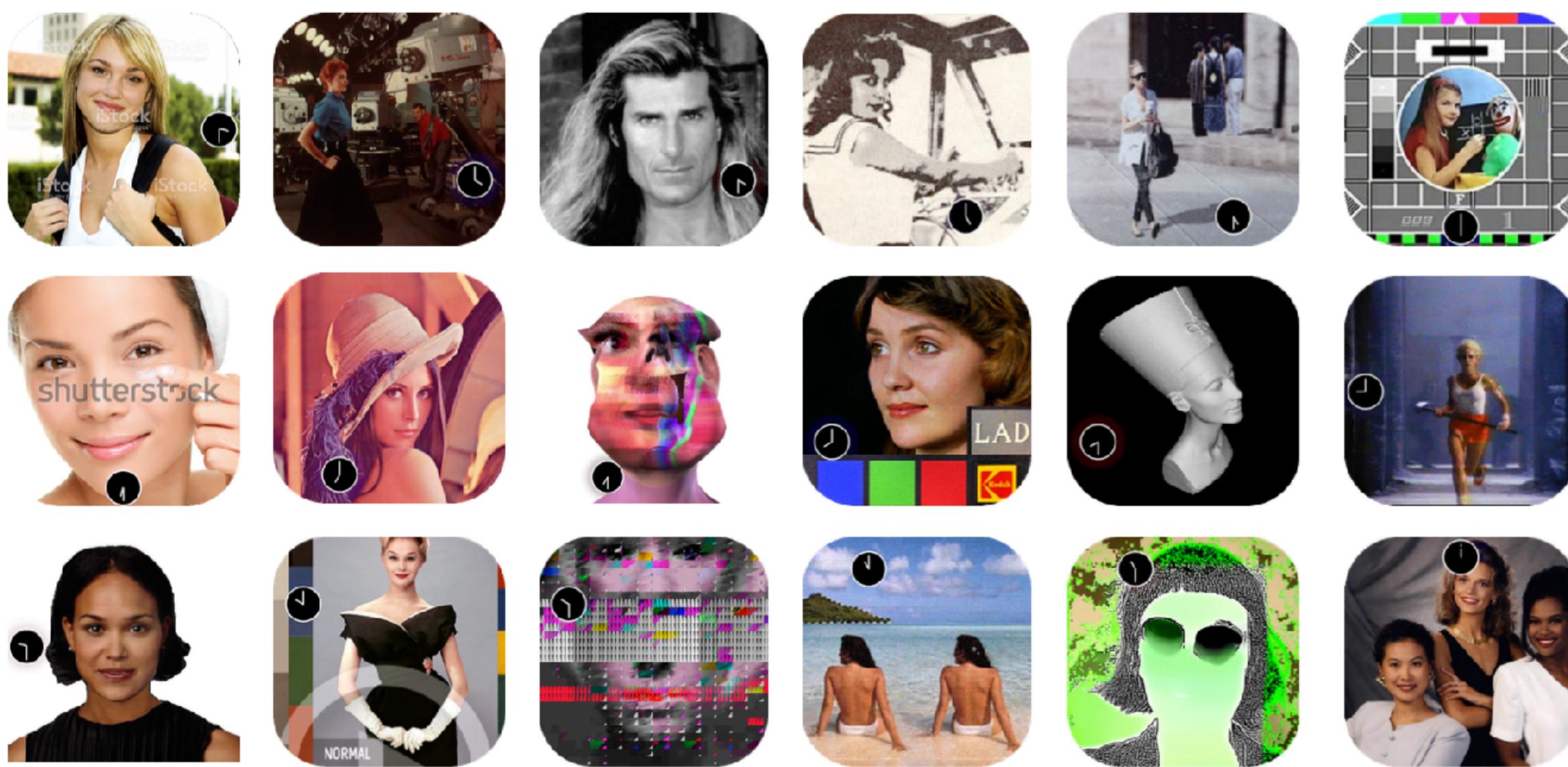


DRAFT FOR LES INCONNES



<https://beyondresolution.info/Behind-White-Shadows>





## **Technique Nique pour les Inconnues (2019-2020)**

Telegram sticker set

A fundamental part of the history of image-processing, webdesign, and the standardization of settings within both analogue and digital media are test cards, placeholder images, bots, digital actroids or virtual assistants. Engineers use these images to evaluate the quality of image processing, the rendering and composition of the architecture of a (digital) space, but also simply to make latent spaces more amicable.

However, just like the canned laughter tracks of televisions shows, that are made by real people who were immortalized when they lend their laughs in the 30s or 40s, these women too seem to have prolonged their existence for as long as the (digital) realms will copy and reuse them. They have become a "shell without a ghost".

The i.R.D. commemorates unaccepted and depreciated standards



**CRITICAL  
DIGITAL  
MATERIAL  
(ITIES)**

ROSA MENKMAN

**BEYOND**

**RESOLUTION**

