

THE TEXTURE AND THE 4K/UHD WORKFLOW

HOW TO CONTROL THE SHARPNESS

FULL VERSION



A PRESENTATION FROM
THE IMAGO TECHNOLOGY COMMITTEE

V15 - 180908

PRESENTATION SUMMARY: **FULL VERSION**

THE TEXTURE AND THE 4K WORKFLOW

TEXTURE AND LOOK OF THE IMAGE, HOW TO CONTROL THE SHARPNESS.

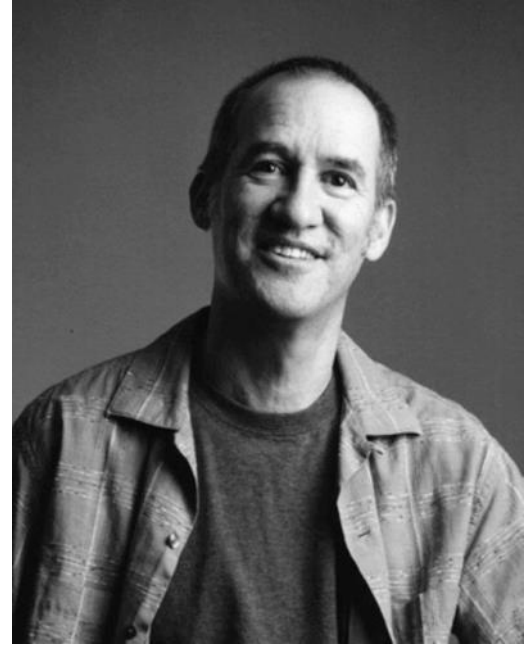
CHAPTERS:

- 1** - CAMERA & SENSORS - REMINDER
- 2** - THE SHOOTING PARAMETERS - MONITORING
- 3** - THE TYPE OF LIGHTING FIXTURES
- 4** - CAMERA: SENSOR, OLPF AND MTF
- 5** - THE ROLE OF THE DETAILING SYSTEM IN CAMERA
- 6** - SHARPNESS & POSTPRODUCTION - MONITORING & SCREENING
- 7** - SHARPNESS & RELEASE- MONITORING & SCREENING
- 8** - CAMERA & LENSES - THE PARADOX
- 9** - TEXTURE CONTROL - WHICH TOOLS?
- 10** - EXAMPLE OF CONFUSION
- 11** - CONCLUSIONS
- 12** - ARRI TEXTURE TOOLS
- 13** - EXAMPLE: FILM 'CARTAS DA GUERRA'

SPECIAL THANKS TO:



DAVID STUMP ASC



ROBERTO SCHAEFER ASC AIC

This presentation includes several slides
shown at Camerimage 2017 during the:

ASC / IMAGO PANEL

The importance of Cinematographer's Collaboration
Beyond Borders



The panel comprised:

Louis Philippe Capelle, SBC

Rolf Coulanges, BVK

Joe Dunton, MBE BSC

Jacek Laskus, ASC, PSC

Stephen Lighthill, ASC

Jannicke Mikkelsen, FNF

Rachel Morrison, ASC

Steven Poster, ASC, ICG

Philippe Ros, AFC

Roberto Schaefer, ASC, AIC



WHY IS IT INTERESTING TO LINK THE TEXTURE TO THE UHD/4K WORKFLOW?

Of course the specificities and issues related to the texture exist also in a 2K workflow, but shooting in UHD/4K reveal in a most flagrant way some peculiarities as well as some difficulties encountered by filmmakers, cinematographers, colorists to name but a few when they intend to control the texture.

WHY IS IT INTERESTING TO LINK THE TEXTURE TO THE UHD/4K WORKFLOW?

In addition to highlighting some facts, this presentation intend to create a debate and to question both users and manufacturers.

The Imago Technology Commitee launched:

IMAGO SURVEY REQUESTS TO MANUFACTURERS

https://www.umfrageonline.com/s/Manufacturers_request

Develops several topics described in this part.

SOME WORDS FOR TEXTURE

For science

- Definition
- Detailing

For perception

- Sharpness
- Accutance (Combination of detailing & Micro contrast)

Definition: number of pixels related to frame ratio. Ex: 4K, for Flat (1.85:1) = 3996 x 2160 pixels

Resolution: pixel density: number of pixels/square inch

SEMANTICAL ISSUES

SEMANTICAL ISSUES

Different words, different meanings

- Sharpness
- Over sharpness
- Sharpen
- Sharpening
- Detail Level
- Detailing

SEMANTICAL ISSUES

Different words, different meanings

- Detailing has different meanings for each manufacturer

CONTROL OF THE TEXTURE

What is at stake:

Conveying emotion & meaning

THE SHARPNESS AND THE 4K WORKFLOW

1 - CAMERA & SENSORS - REMINDER

1 - CAMERA & SENSORS - REMINDER

For the sake of clarity and vulgarisation, the following tables intentionally excludes, among other things:

- The size of the sensor
- The number of photosites
- The number of photosites dedicated for the image
- The size of the photosites
- The photosite pitch
- The type of lenses
- The type of post-production

1 - CAMERA & SENSORS - REMINDER

Cameras	Number of photosites	Recording (resolution)
Sony F65	20 M	4 K
Red Dragon	19 M	4 K
Sony F55	11.6 M	4 K
Canon C500	9,5 M	4 K
Varicam 35	8,9 M	4 K
Black Magic 4K	8,2 M	4 K (Ultra HD)
Alexa XT (Raw Recording w/ Open gate)	7,5 M	3,4 K (Up-scaling to 4K)

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1 - CAMERA & SENSORS - REMINDER

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Choosing F65 for wide shots and F55 for close shots

is usually a good solution for the marriage

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CONFUSION

- These cameras deliver all the same definition (resolution)
- But they aren't delivering the same texture and the same sharpness

QUALITY AND NUMBERS

- The number of pixels on a display or on a screen defines an HD, 2K, UHD or a 4K image without any information on the perception of sharpness.
- The lack of standardization and real characteristics leads to several difficulties regarding the perfect understanding of what the quality of a 4K image means.

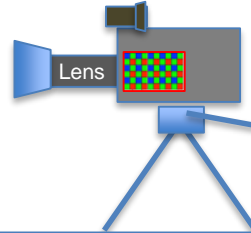
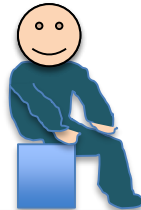
THE SHARPNESS AND THE 4K WORKFLOW

2 -THE SHOOTING PARAMETERS

2 - THE SHOOTING PARAMETERS

Camera

- ✓ Type of sensor
- ✓ Recording file types specificities
- ✓ Setting (Gamma/Sharpness/OLPF...)
- ✓ Noise reduction

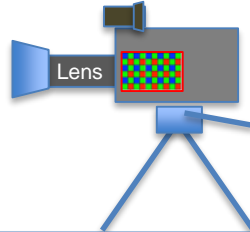
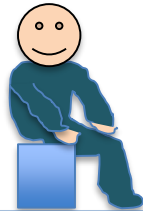


Structure
of the skin

Type of
Lenses
Aperture

Type of
cameras

2 - THE SHOOTING PARAMETERS



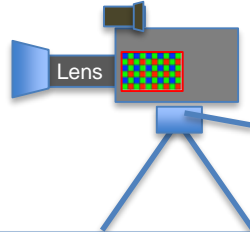
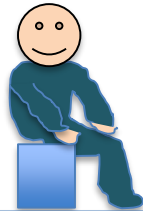
Structure
of the skin

Type of
make-up

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Lenses
Aperture

Type of
cameras

2 - THE SHOOTING PARAMETERS



Structure
of the skin

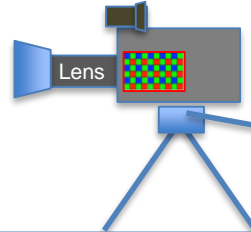
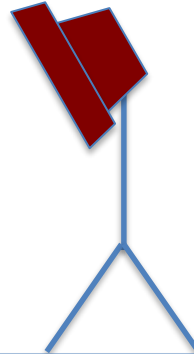
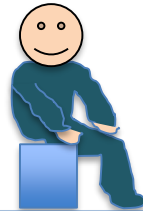
Type of
make-up
Costume
s

Type of
Lenses
Aperture

Type of
cameras

2 - THE SHOOTING PARAMETERS

Type of lighting



Structure
of the skin

Type of
make-up
Costume
s

Type of
lighting
fixtures

Type of
Lenses
Aperture

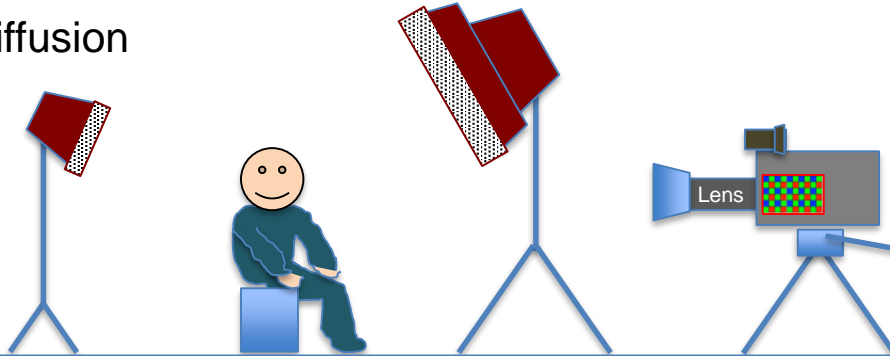
Type of
cameras

2 - THE SHOOTING PARAMETERS

Before choosing glass filters the choice of lighting fixtures and diffusion remains essential

Diffusion

Diffusion



Structure
of the skin

Type of
make-up
Costume
s

Type of
lighting
fixtures

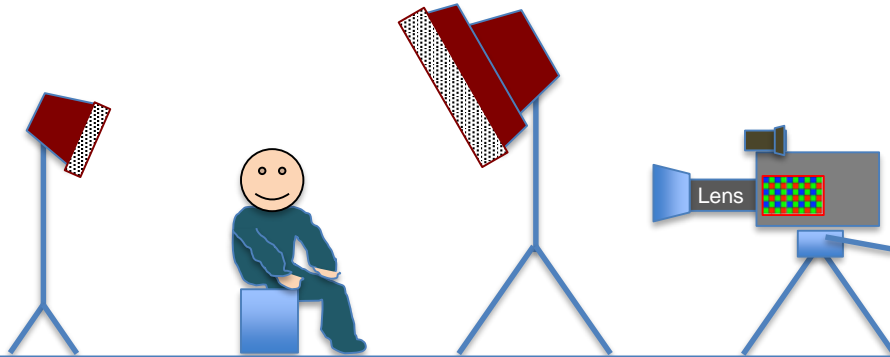
Type of
Lenses
Aperture

Type of
cameras

2 - THE SHOOTING PARAMETERS

See chapter 3

THE TYPE OF LIGHTING FIXTURES



Structure
of the skin

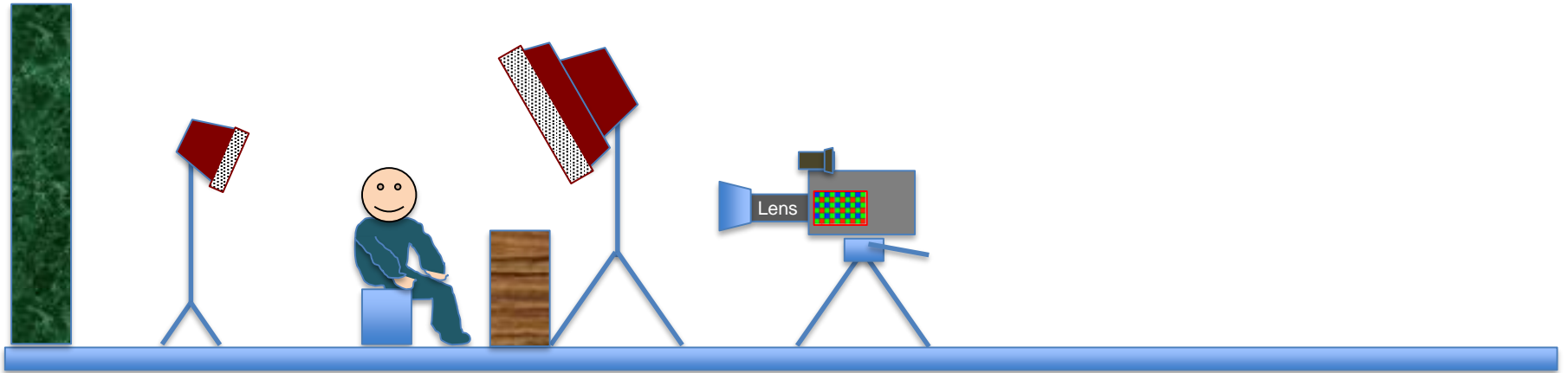
Type of
make-up
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s

**Type of
lighting
fixtures**

Type of
Lenses
Aperture

Type of
cameras

2 - THE SHOOTING PARAMETERS



Structure
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Type of
make-up
Costume
s

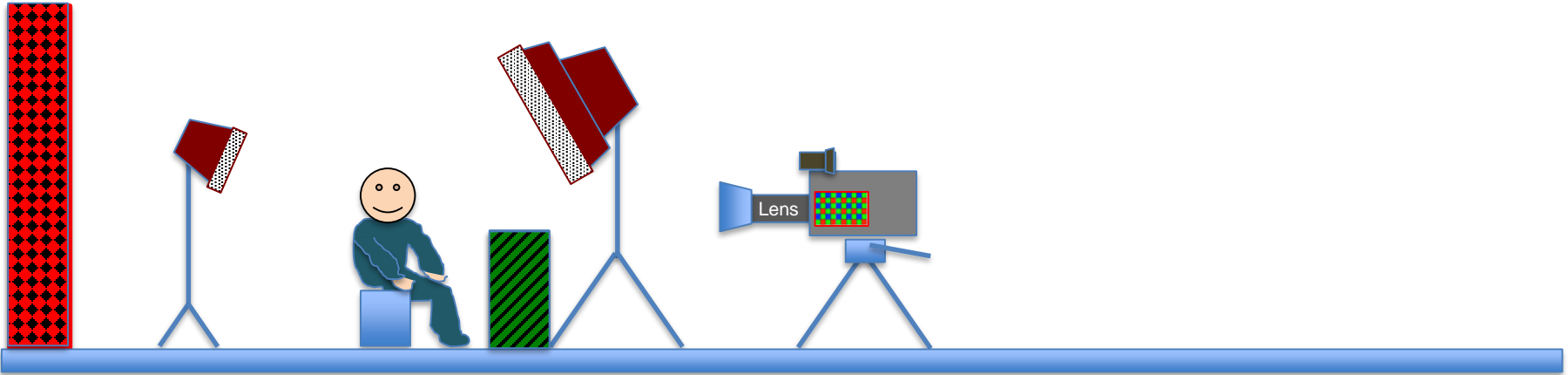
Type of
lighting
fixtures

Type of
Lenses
Aperture

Type of
cameras

2 - THE SHOOTING PARAMETERS

The perception of sharpness depend also on the stuctures and colors of the backgrounds and foreground.
It also depends on the results of the depth of field on these backgrounds and foregrounds.



Structure
of the skin

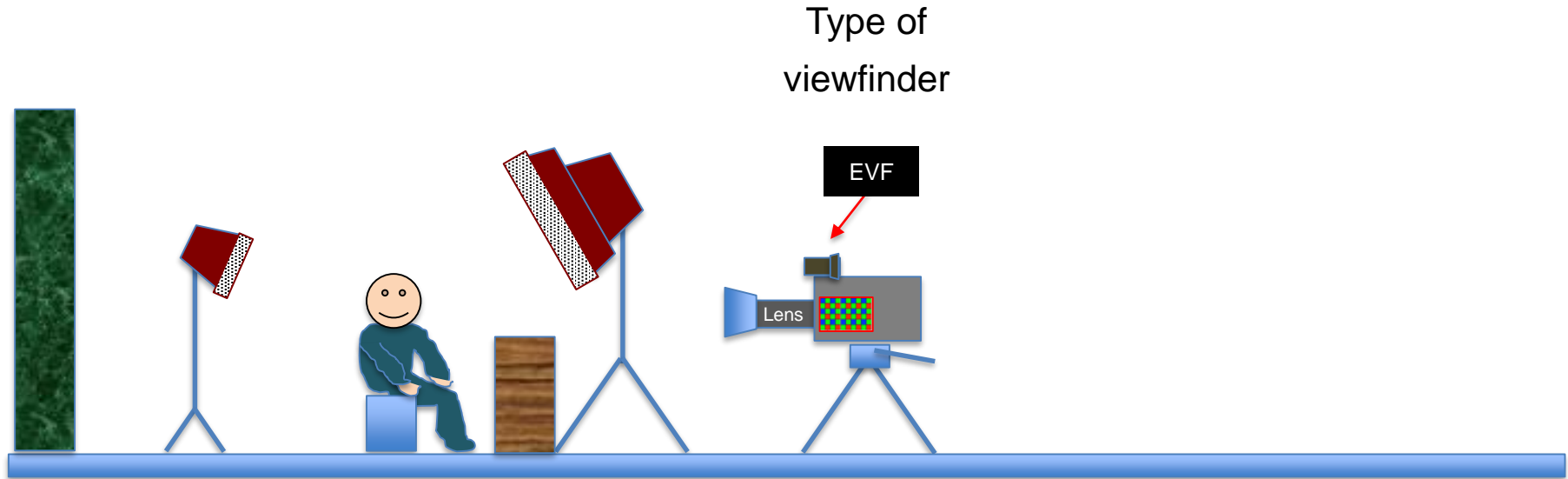
Type of
make-up
Costume
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Type of
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Type of
Lenses
Aperture

Type of
cameras

2 - THE SHOOTING PARAMETERS



Structure
of the skin

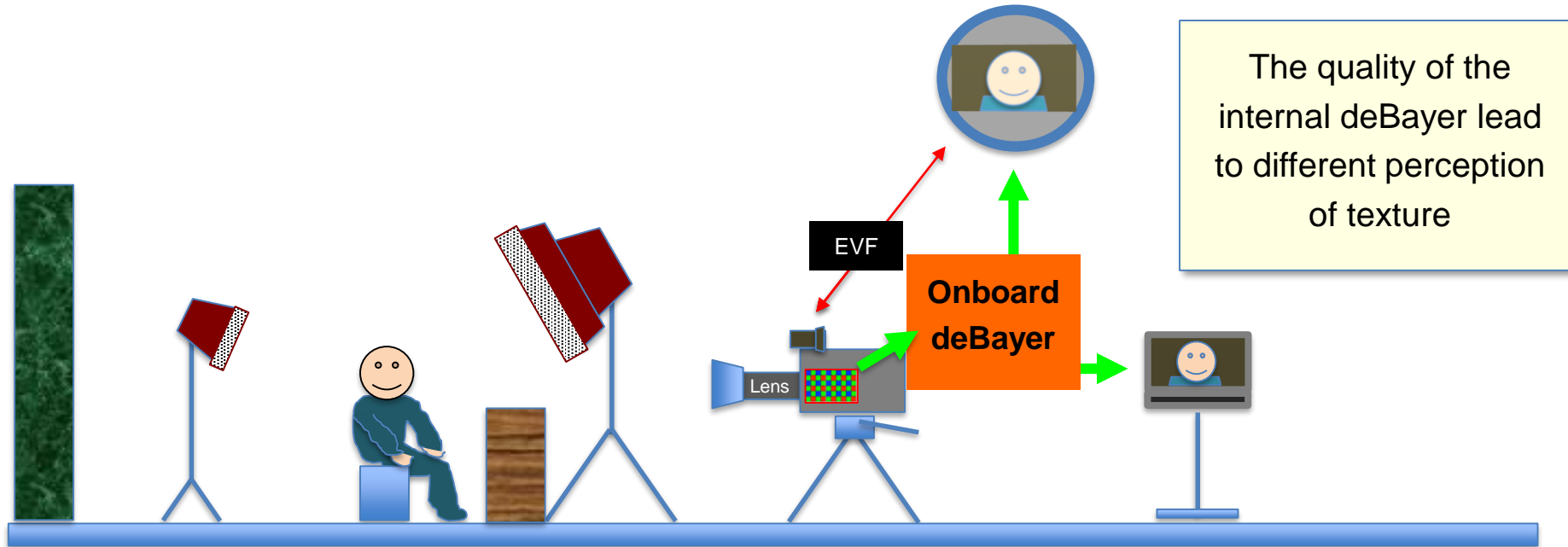
Type of
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Type of
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Type of
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Aperture

Type of
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2 - THE SHOOTING PARAMETERS



Structure
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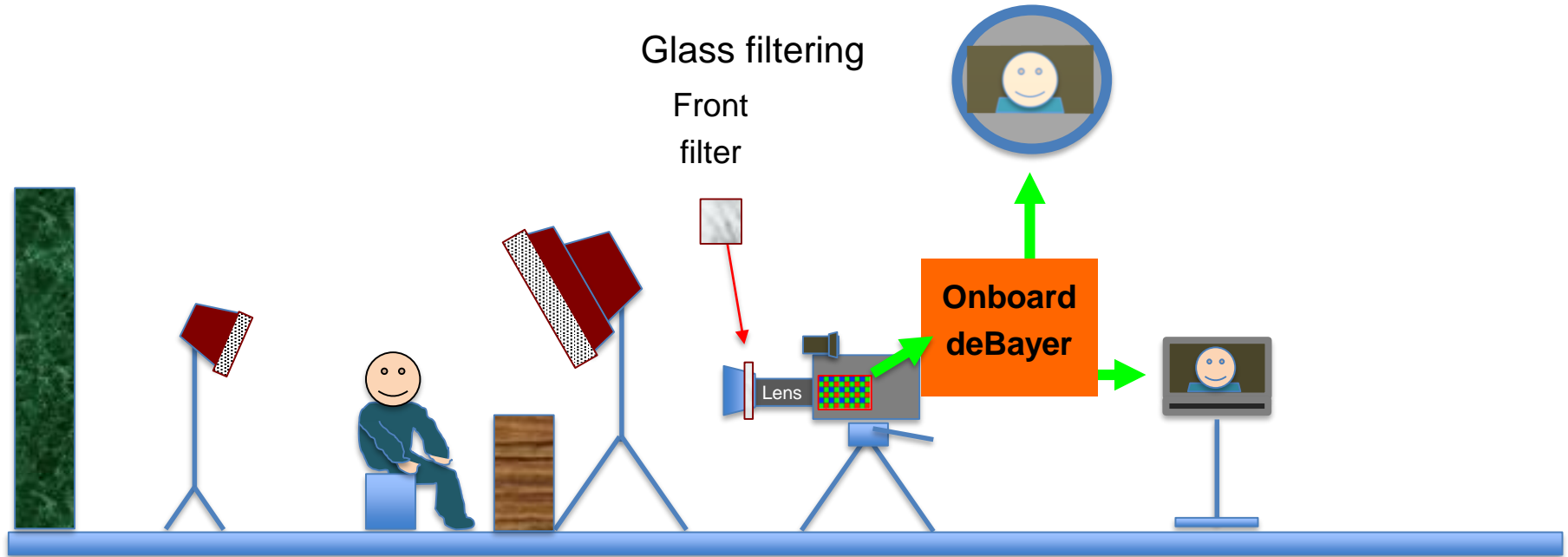
Type of
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2 - THE SHOOTING PARAMETERS



Structure
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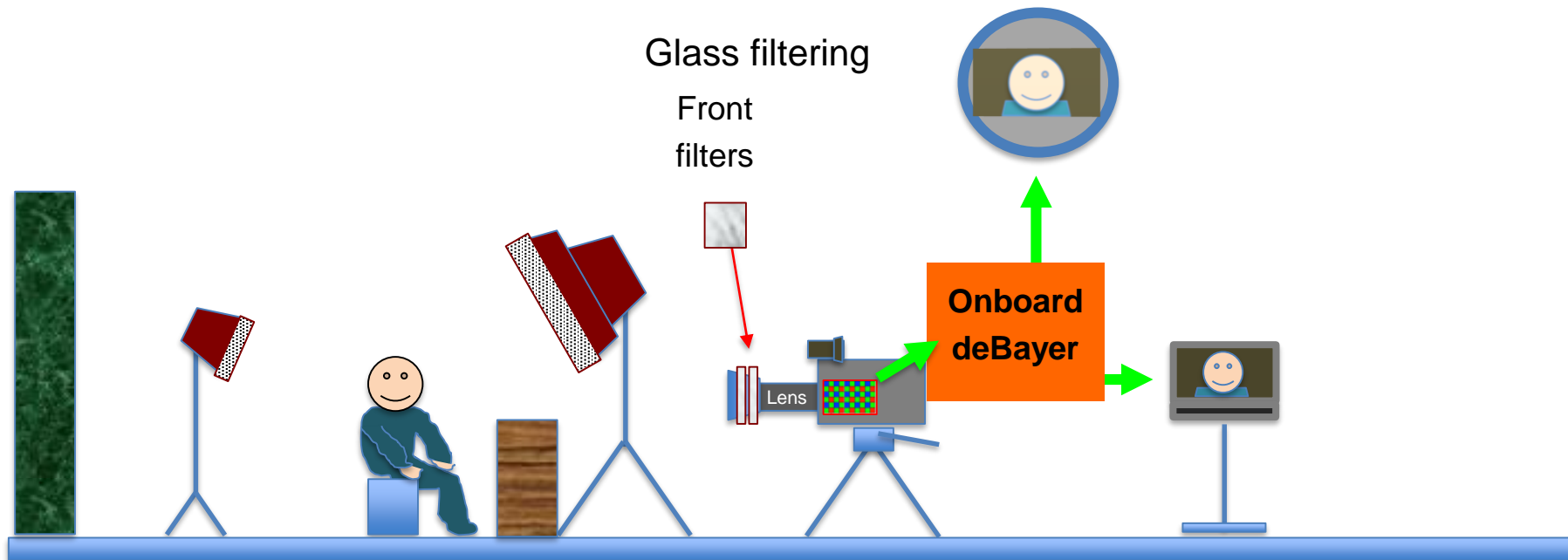
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2 - THE SHOOTING PARAMETERS



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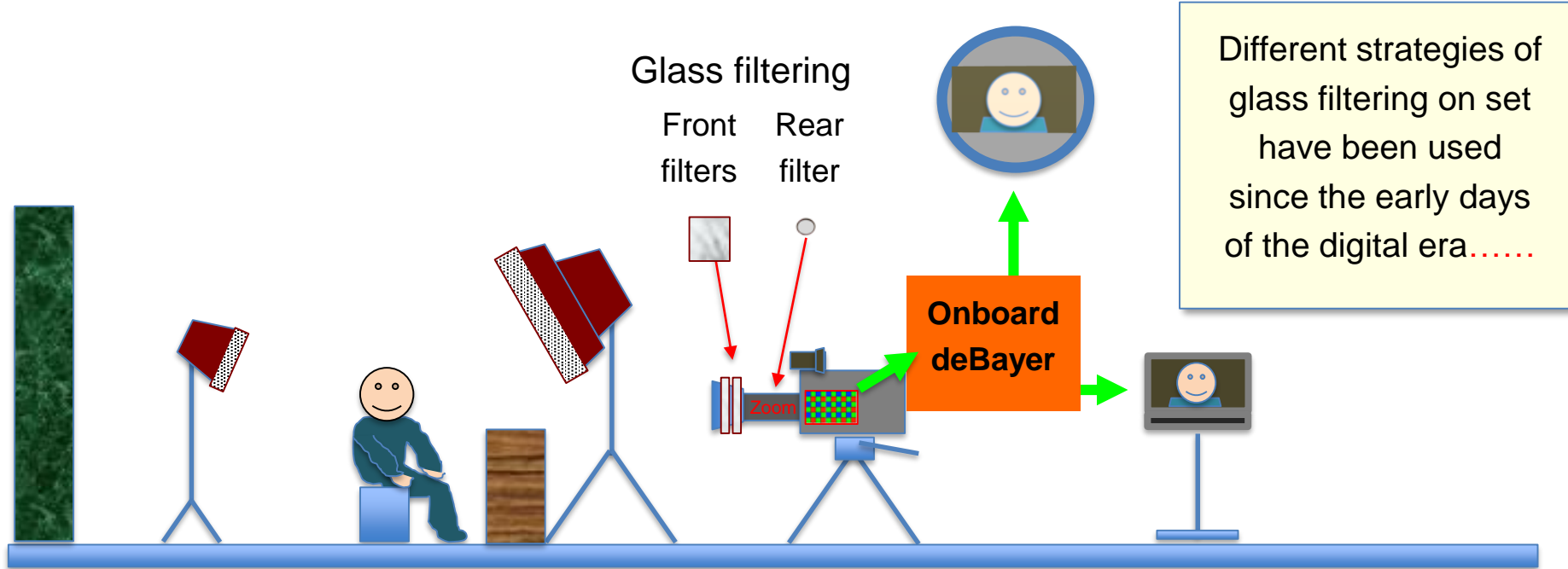
Type of
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Type of
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fixtures

Type of
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Aperture

Type of
cameras

2 - THE SHOOTING PARAMETERS



Glass filtering

Front
filters

Rear
filter

Onboard
deBayer

Different strategies of
glass filtering on set
have been used
since the early days
of the digital era.....

Structure
of the skin

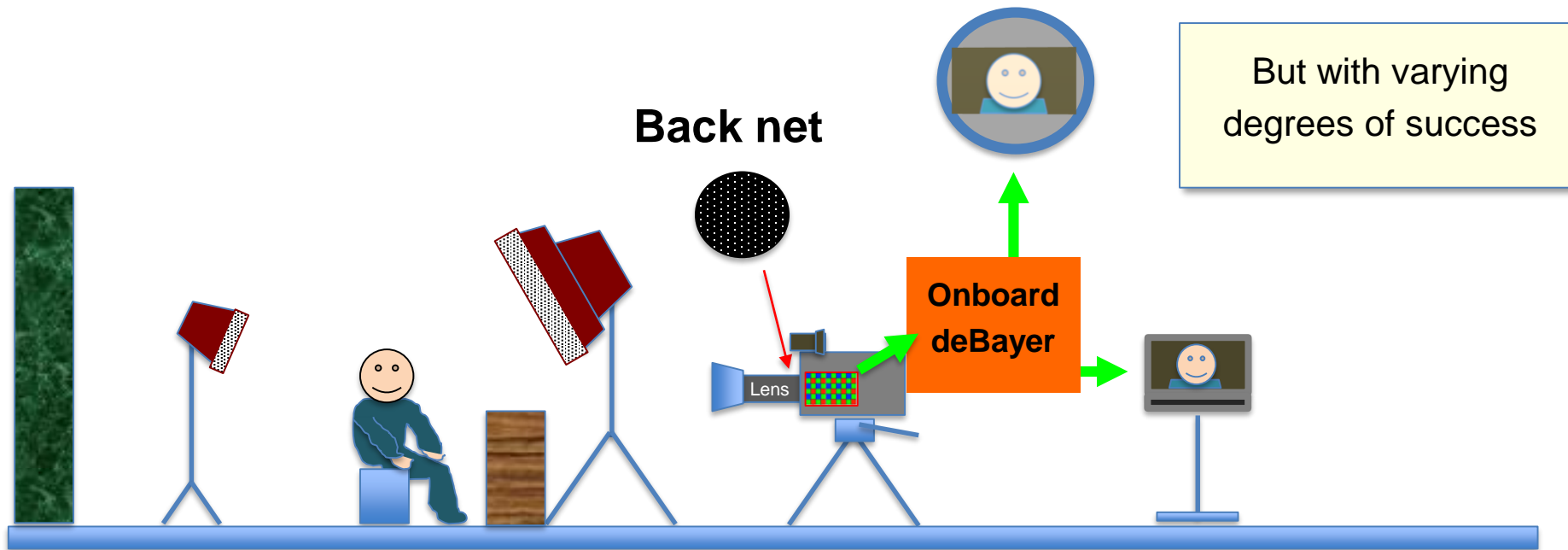
Type of
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Costume
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2 - THE SHOOTING PARAMETERS



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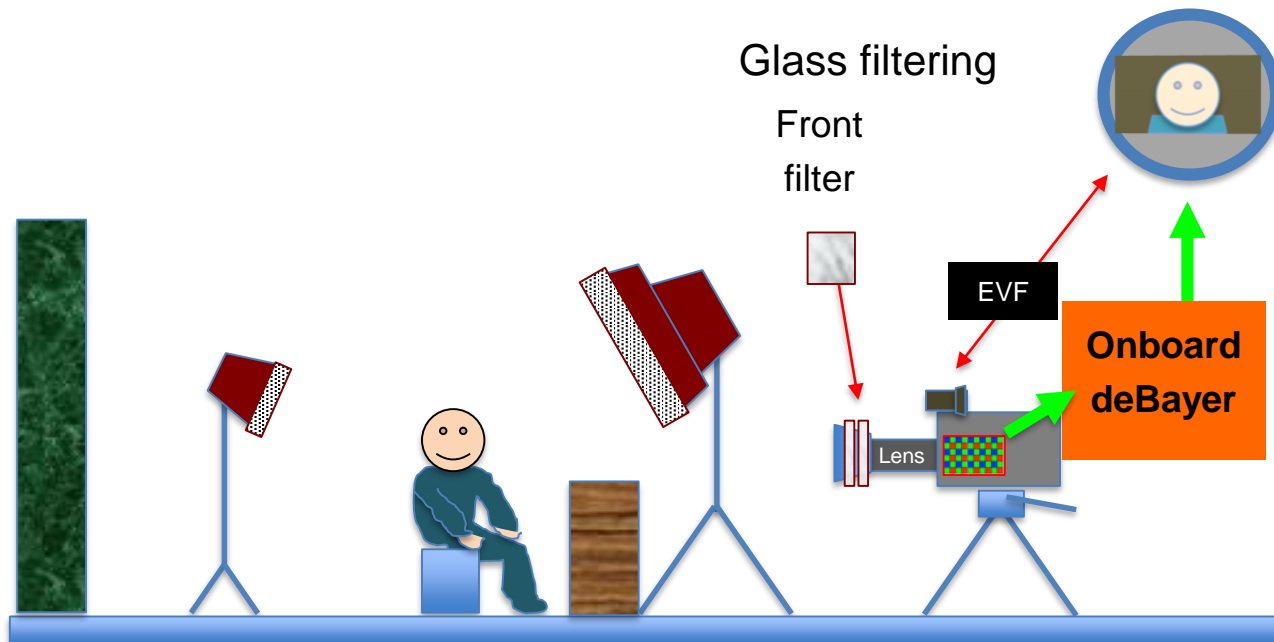
Type of
lighting
fixtures

Type of
Lenses
Aperture

Type of
cameras

But with varying
degrees of success

2 - THE SHOOTING PARAMETERS **GLASS FILTERING AND EVF**



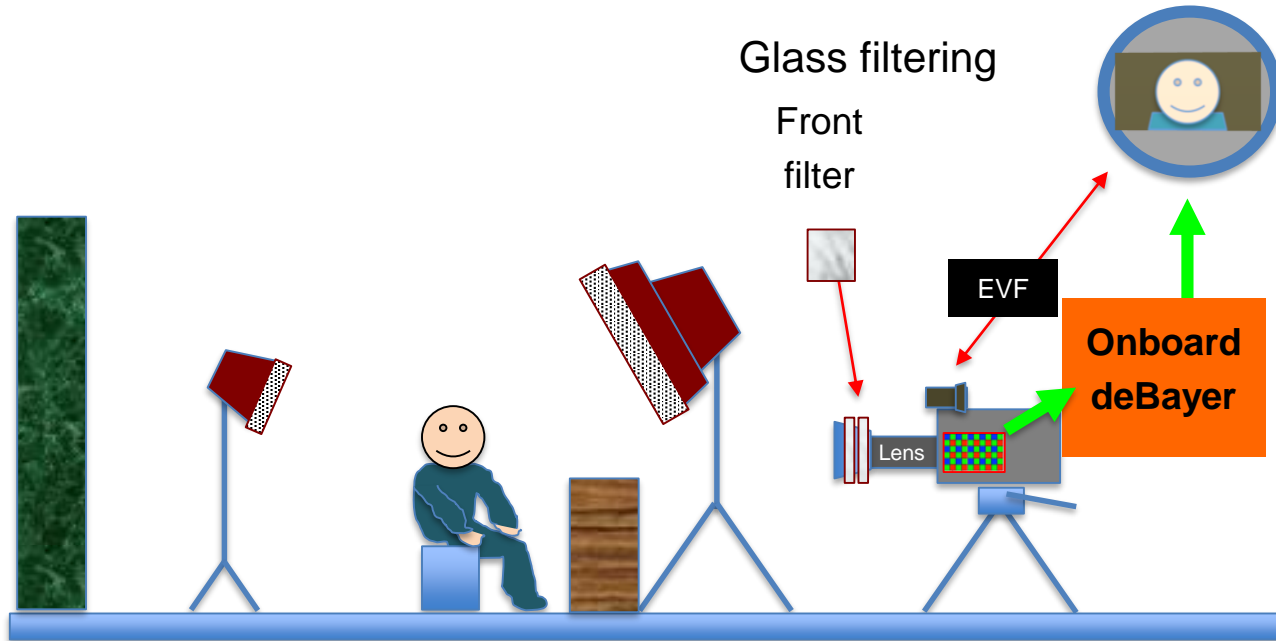
Question:

Can we easily choose glass filtering with an EVF?

Answer:

We can't, we don't see much...

2 - THE SHOOTING PARAMETERS: **GLASS FILTERING AND VFX**



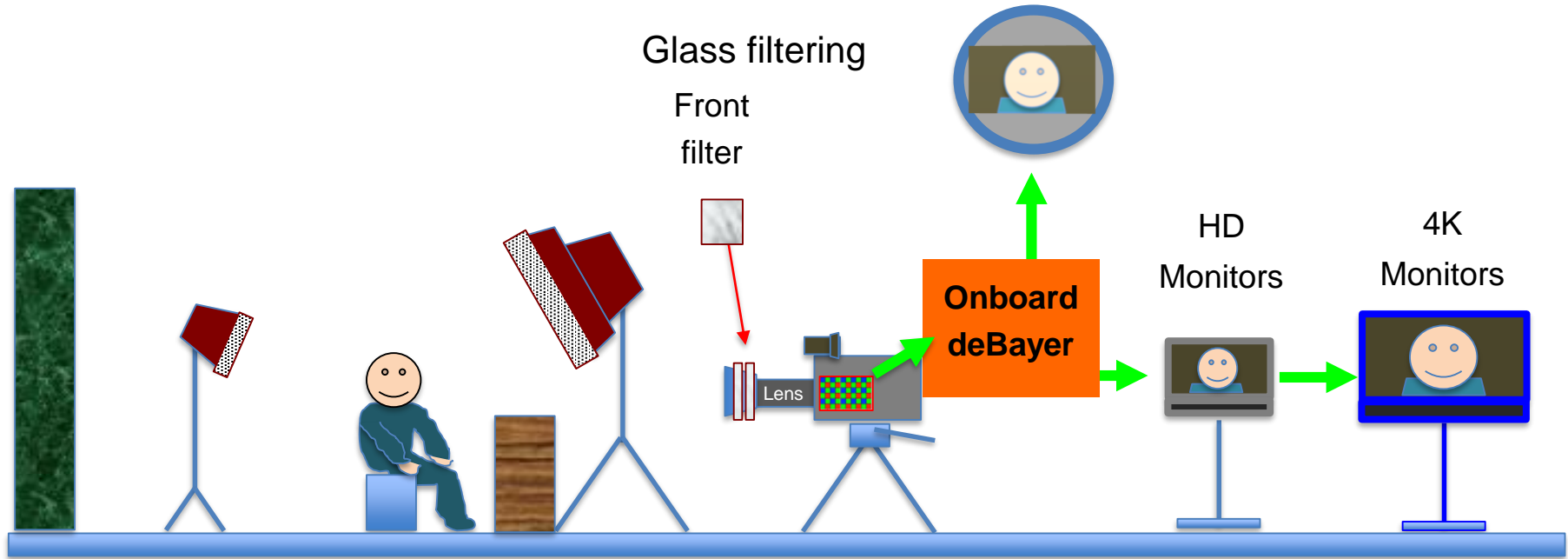
Question:

Can we easily use glass filtering when we are shooting with VFX?

Answer:

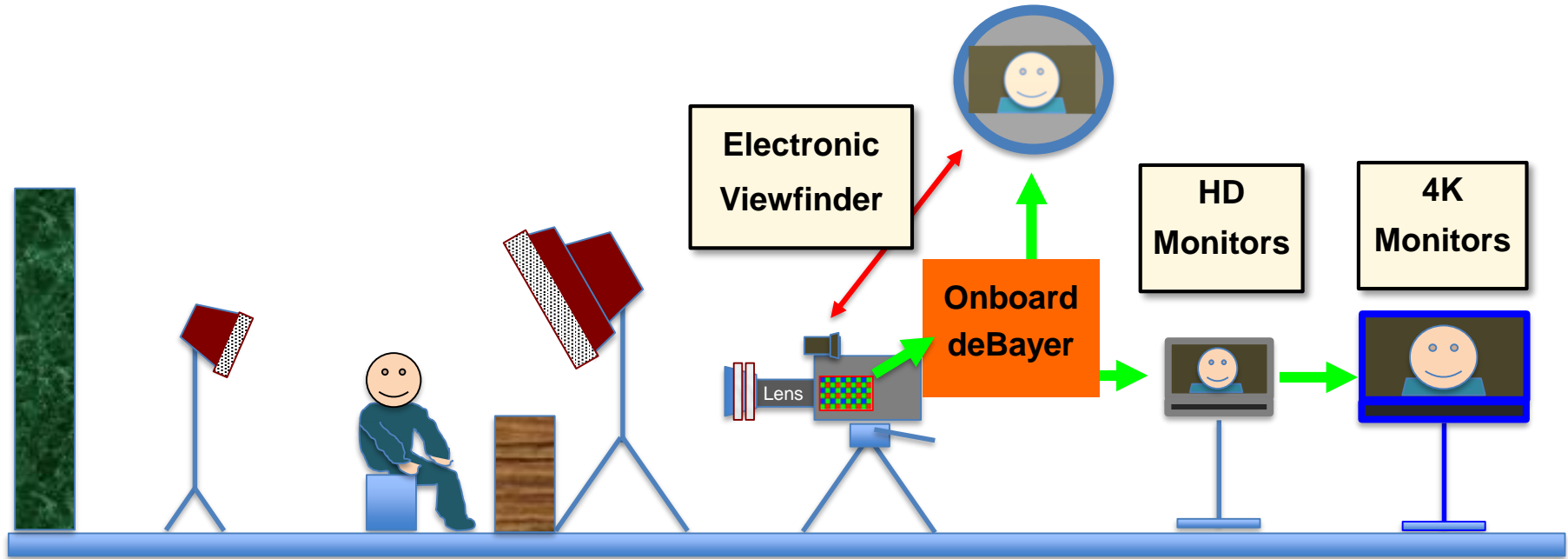
VFX department don't allow the use of glass filtering...

2 - THE SHOOTING PARAMETERS



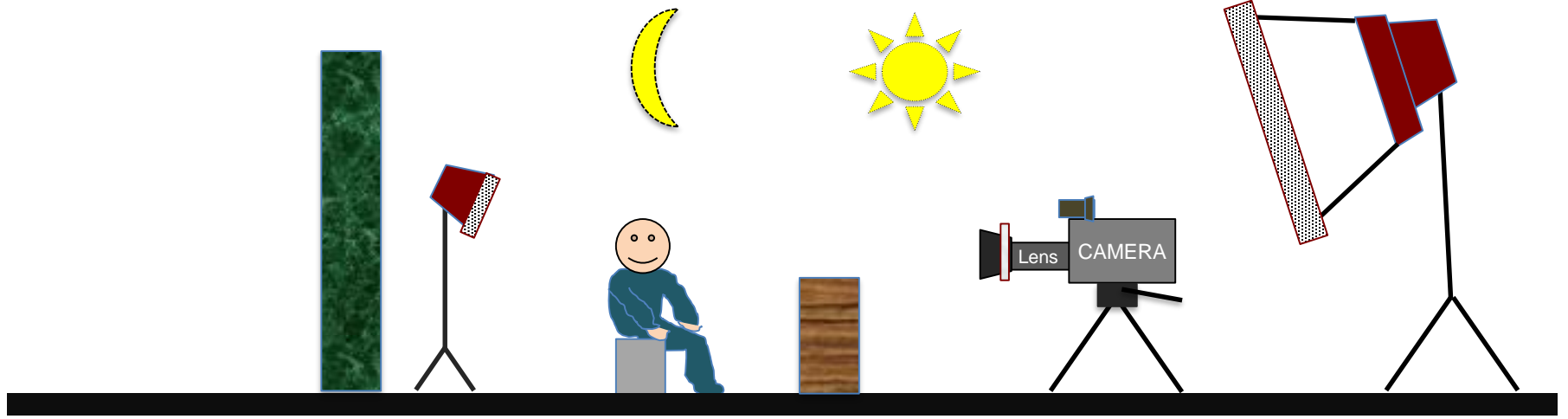
Using a 4K monitor can lead to additional expenses for the whole shoot. It is best used during the tests to choose the glass filters and to check the texture.

2 - THE SHOOTING PARAMETERS: **MONITORING**



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2 - THE SHOOTING PARAMETERS

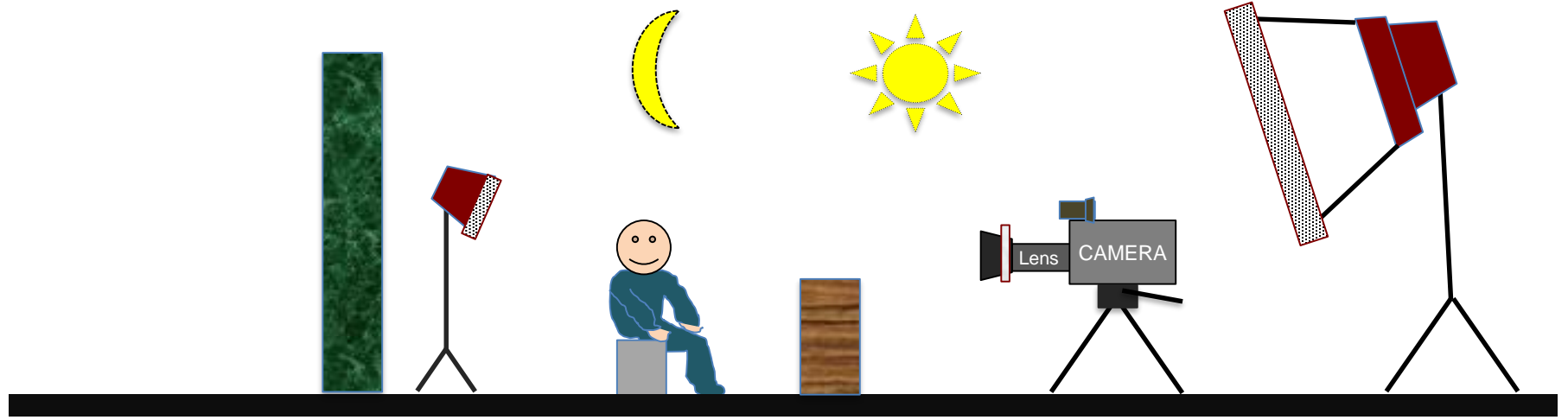


Parameters

- Camera - type of sensor*
 - ✓ Recording file types specificities
 - ✓ Setting (Gamma/sharpness/OLPF...)
 - ✓ Noise reduction
- Lens & Aperture
- Glass filtering
- Type of lighting
- Lighting fixtures - type/diffusion
- Texture of the skin / Make-up
- Costume
- Density of atmosphere: particles/fog/dust...
- Set design/Background/Foreground

*In this presentation, we only focus on CMOS cameras. Different sensors: different textures.

2 - THE SHOOTING PARAMETERS

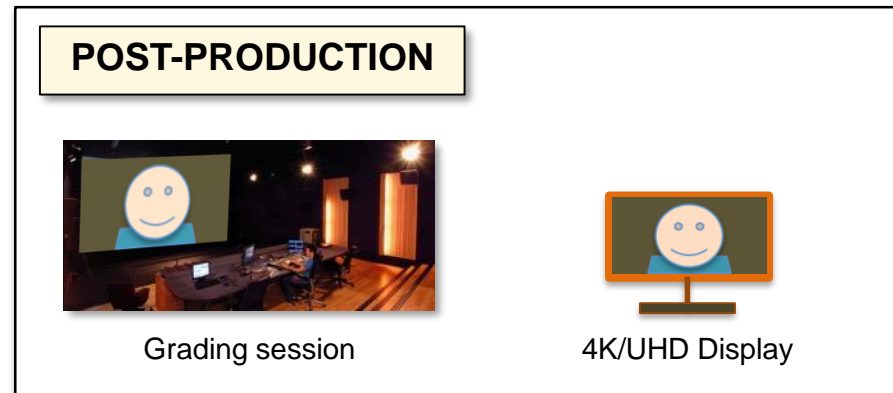
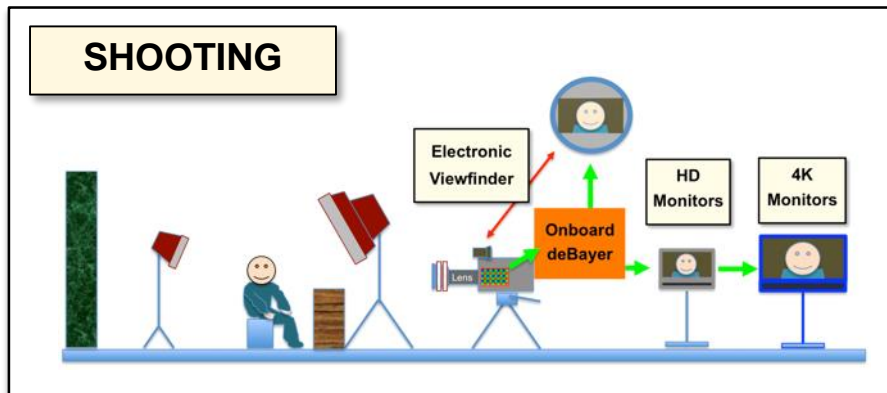


Parameters

TOO MANY PARAMETERS!

2 - THE SHOOTING PARAMETERS: **MONITORING & SCREENING**

MONITORING & SCREENING

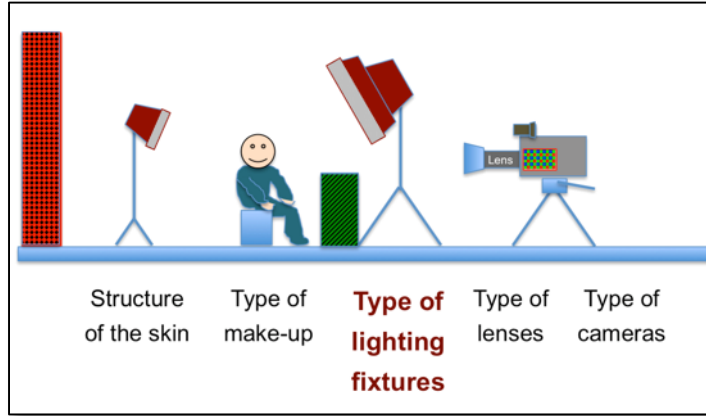


Without reference displays or professional screenings, deciding about a level of sharpness is quite impossible

THE SHARPNESS AND THE 4K WORKFLOW

3 - THE TYPE OF LIGHTING FIXTURES

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Since the arrival of digital cameras many manufacturers have designed systems to soften the lights. Due to the oversharpeness?

The LED, even with different levels of qualities, and the diffusion systems became quite ubiquitous.

3 - THE TYPE OF LIGHTING FIXTURES

VISUAL SHARPNESS AND LED

Initiated by cinematographer, John-Christian Rosenlund, an LED test was launched on August 30th. 2016 in cooperation between the FNF (Norwegian Society of Cinematographers) and the NRK (Norwegian Broadcasting Corporation)

<https://www.led-light-test.com>

<https://www.led-light-test.com/the-idea-behind>

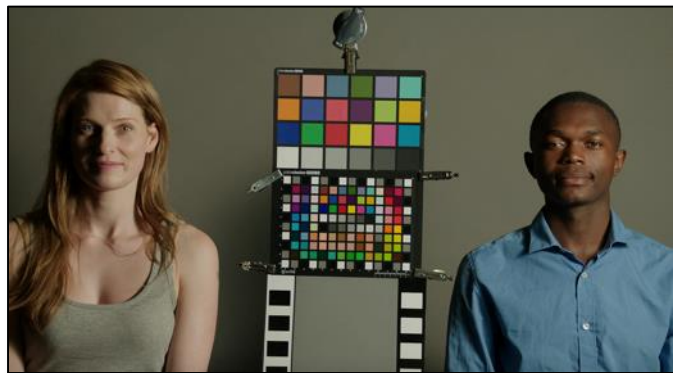


3 - THE TYPE OF LIGHTING FIXTURES

VISUAL SHARPNESS AND LED

THE IDEA BEHIND THE TEST

- How does the camera chip react on LED - compare to natural light sources?
- Are there any color differences in a RAW file that comes from an LED source versus natural light sources such as Daylight or Tungsten?
- Does the limited color spectrum in the LED give the human skin a kind of «plastic / digital» looking surface in post production?



3 - THE TYPE OF LIGHTING FIXTURES

VISUAL
SHARPNESS
AND LED



Close up of the difference in contrast, color depth from some selected high quality LED lights (Identical lens camera and workflow).

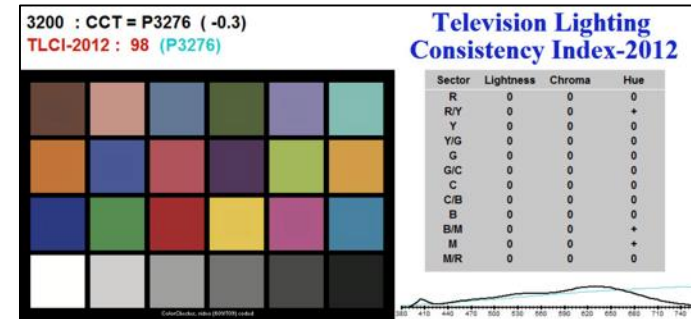
3 - THE TYPE OF LIGHTING FIXTURES

VISUAL SHARPNESS AND LED

WHICH TOOLS TO MEASURE THE QUALITY?

For the precision measurement the TLCI (Television Lighting Consistency Index, TLCI-2012) was used instead of the CRI (Colour Rendering Index).

Because, *“the way the CRI is computed may in extreme cases return negative CRI values, something that is totally without meaning”*.



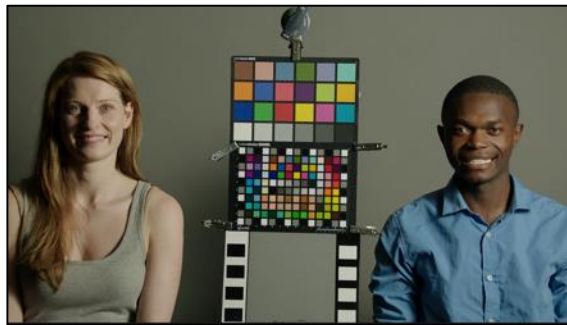
3 - THE TYPE OF LIGHTING FIXTURES

VISUAL SHARPNESS AND LED

SOME IMPORTANT CONCLUSION:

After blind-testing several of the most popular LED fixtures:

The worst LED, low on TLCI and lack of the "In-between» colors, gave a kind of plastic feeling on skin tones - impression of *visually* - less sharp, as if something were missing.



3 - THE TYPE OF LIGHTING FIXTURES

LOSS OF TOOLS TO CREATE DRAMA



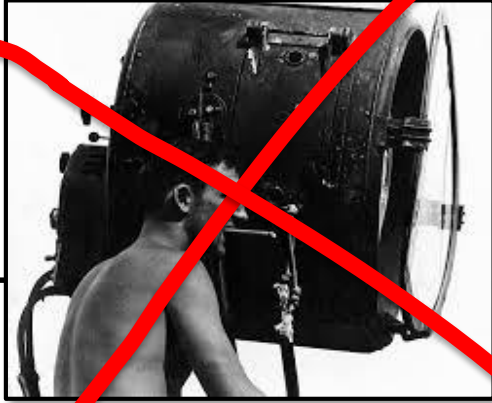
CARBON ARCS



TUNGSTEN

3 - THE TYPE OF LIGHTING FIXTURES

LOSS OF TOOLS TO CREATE DRAMA



CARBON ARCS



TUNGSTEN

3 - THE TYPE OF LIGHTING FIXTURES

LOSS OF TOOLS TO CREATE DRAMA



TUNGSTEN

The plans of the EU are to restrict the use of tungsten halo lights also in theater and film use.

<https://www.ald.org.uk/resources/savetungsten>

3 - THE TYPE OF LIGHTING FIXTURES

LOSS OF TOOLS TO CREATE DRAMA



“Cat People” - Director: **Jacques Tourneur**
Cinematographer: **Nicholas Musuraca** ASC



“Road to Perdition” - Director: **Sam Mendes**
Cinematographer: **Conrad L. Hall** ASC

3 - THE TYPE OF LIGHTING FIXTURES

RISKS

- Lack of fixtures to create nice shadows
- Uniformity of lighting

3 - THE TYPE OF LIGHTING FIXTURES

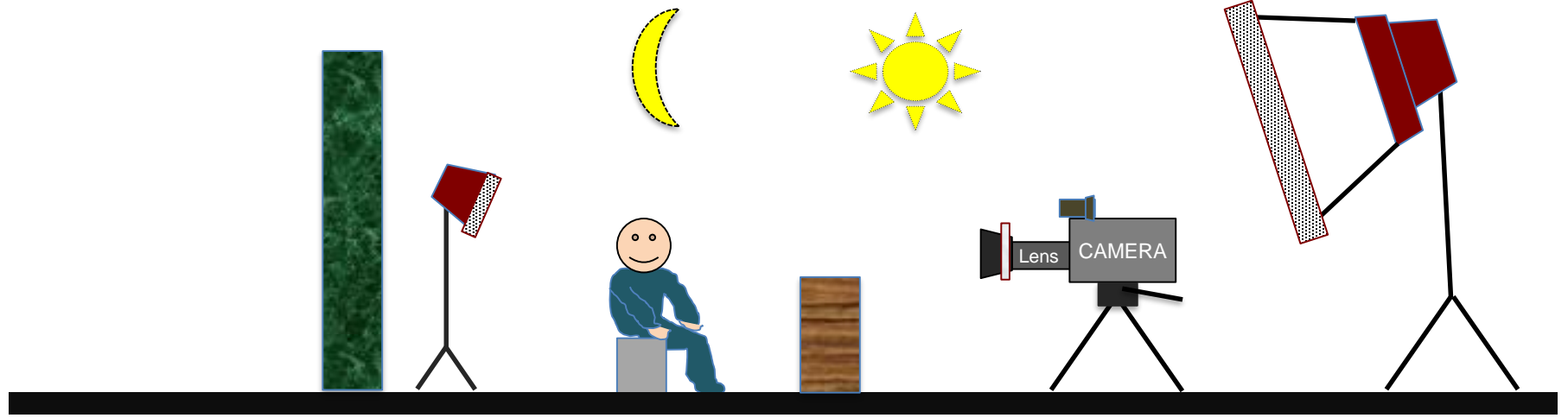
QUESTIONS:

- Do all new LED tools combined with medium range file recording systems or even raw files fit with the minimum of quality expected by filmmakers?
- Do we still have the means to create easily, drama with the lighting fixtures?

THE SHARPNESS AND THE 4K WORKFLOW

4 - CAMERA: SENSOR, OLPF AND MTF

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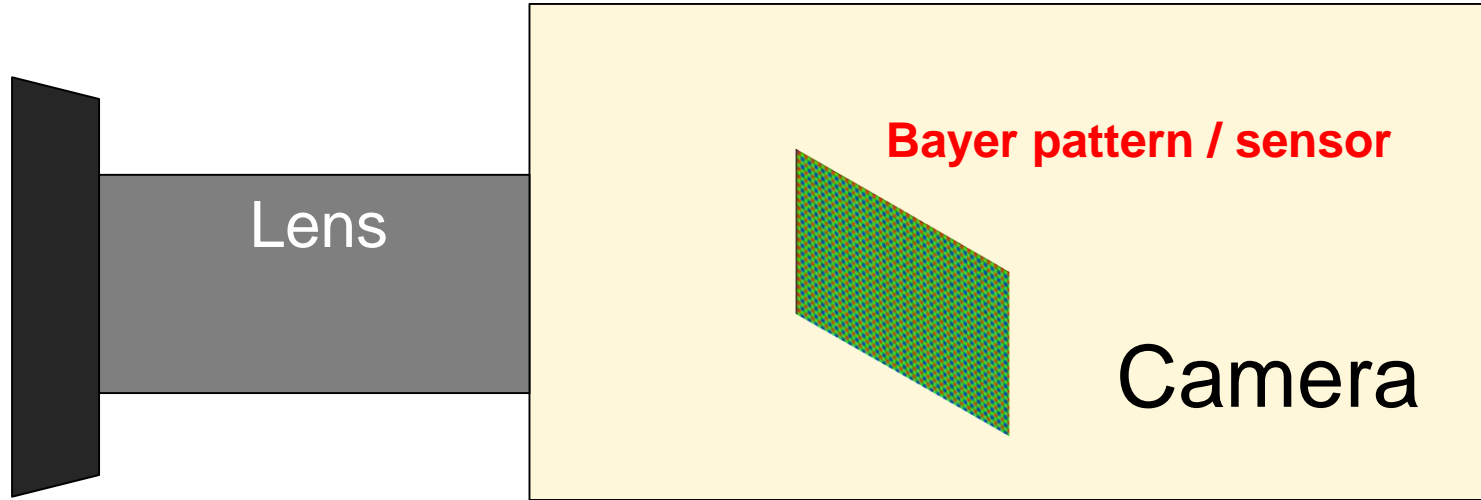


Parameters

- Camera - type of sensor
 - ✓ Recording format specificities
 - ✓ Setting (Gamma/sharpness/OLPF...)
 - ✓ Noise reduction
- Lens & Aperture
- Glass filtering
- Type of lighting
- Lighting fixtures - type/diffusion
- Texture of the skin / Make-up
- Costume
- Density of atmosphere: particles/fog/dust...
- Set design/Background/Foreground

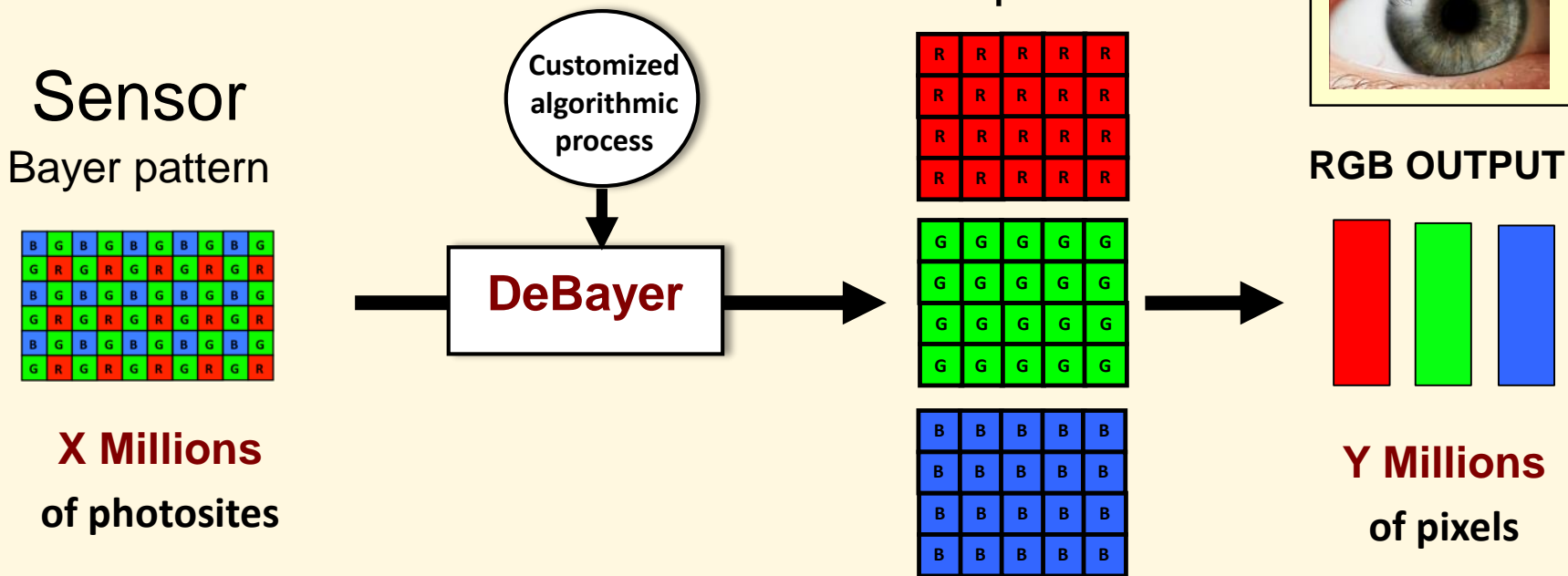
4 - CAMERA: SENSOR, OLPF AND MTF

THE ROLE OF THE SENSOR



4 - CAMERA: SENSOR, OLPF AND MTF

THE DEBAYER PROCESS



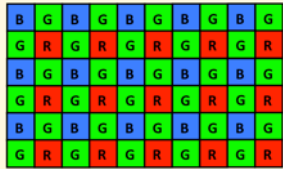
DeBayer means the same thing than Demosaicking

4 - CAMERA: SENSOR, OLPF AND MTF

THE DEBAYER PROCESS

Sensor

Bayer pattern



x Photosites

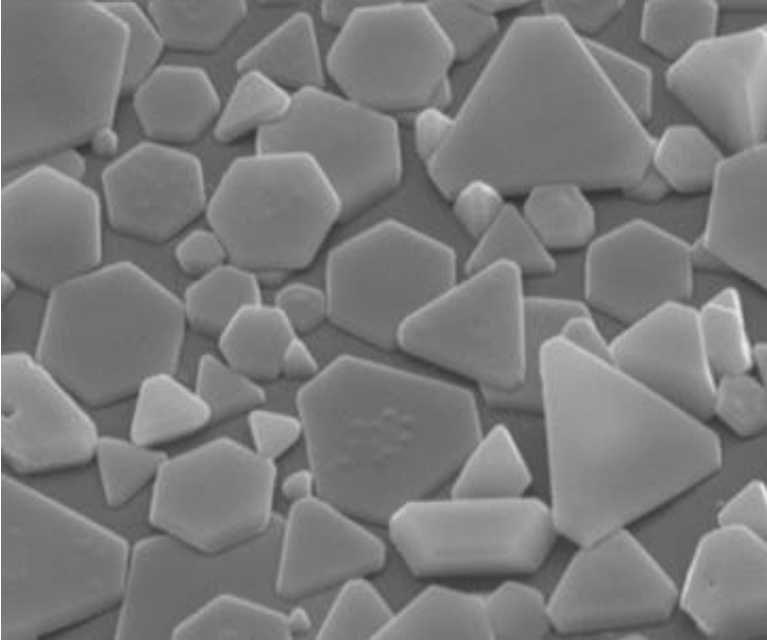
There are no
pixels on a sensor
but photosites

Display
device

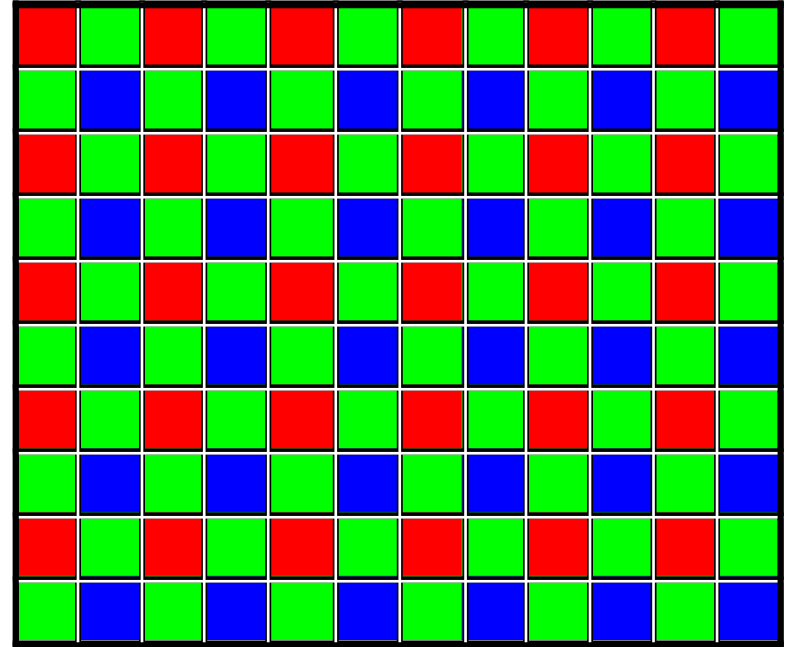


y Pixels

THE ROLE OF THE SENSOR

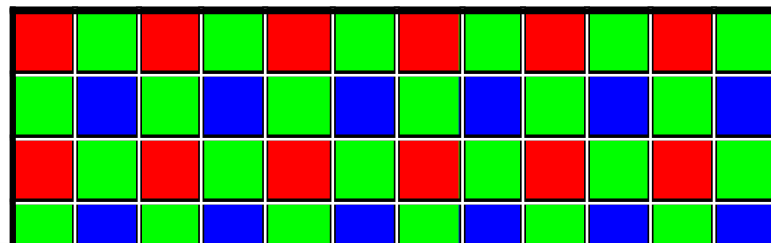
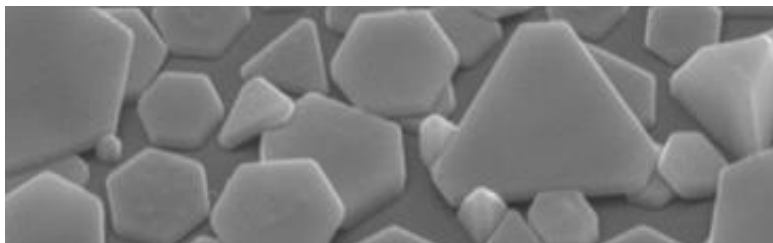


Anisotropic

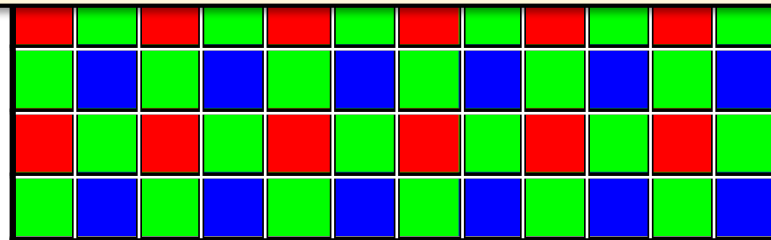
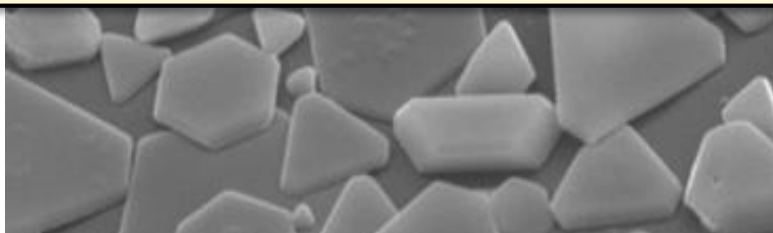


Isotropic

THE ROLE OF THE SENSOR



A marriage between two very different worlds

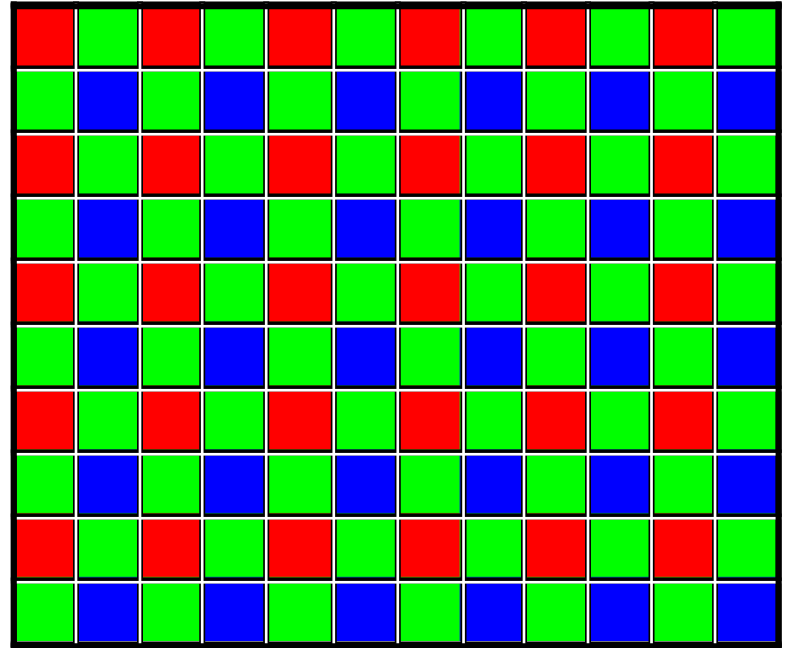


Anisotropic

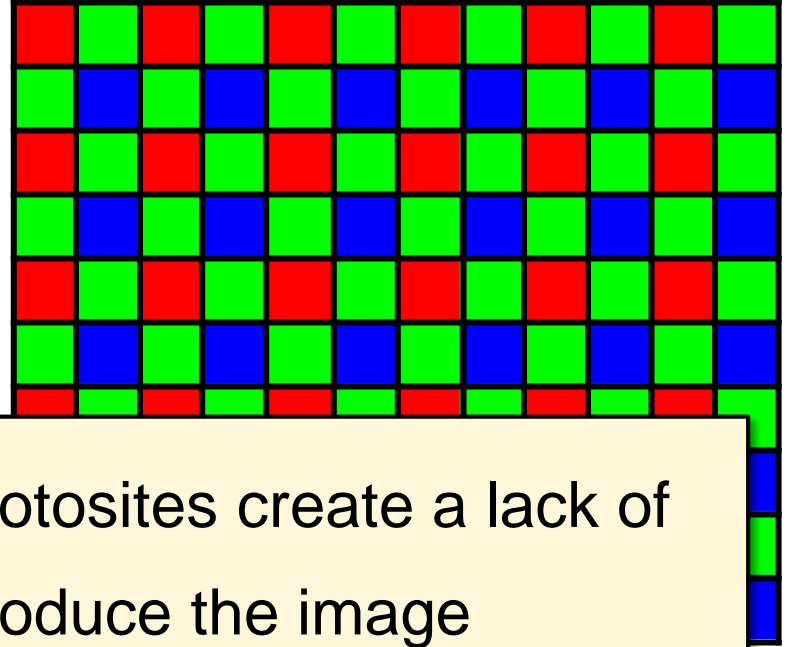
Isotropic

4 - CAMERA: SENSOR, OLPF AND MTF

THE ROLE OF THE SENSOR



THE ROLE OF THE SENSOR



The pitch between the photosites create a lack of information to reproduce the image

THE ROLE OF THE SENSOR

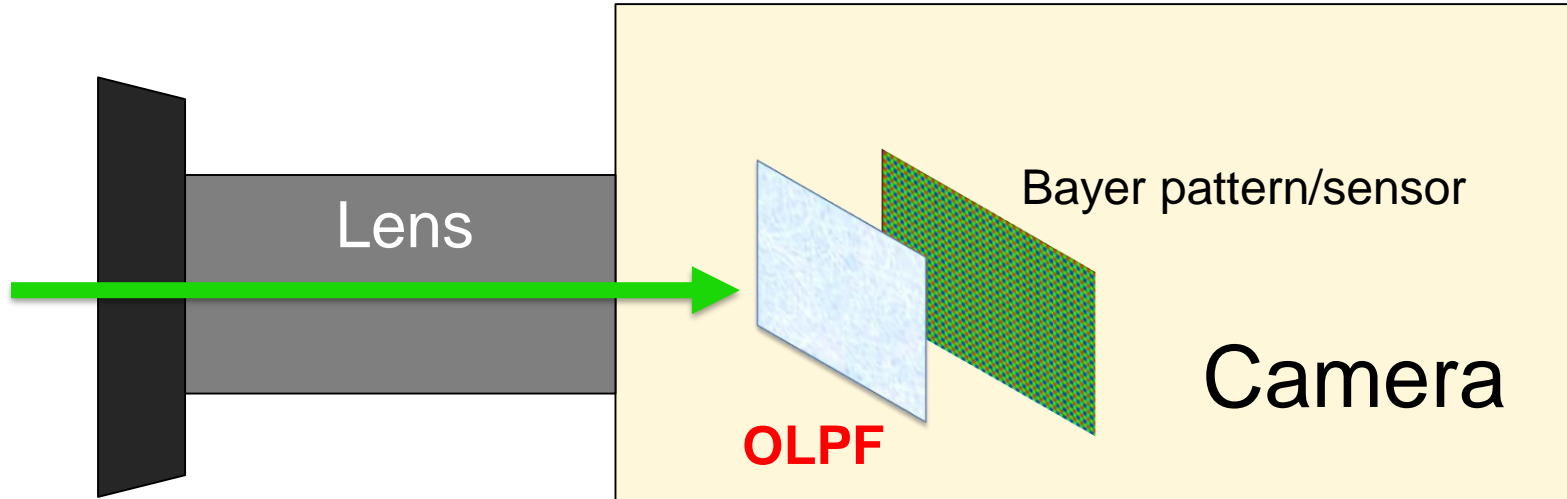
Fixed pattern vs oscillating pattern

The Delta Penelope

Joe Dunton MBE, BSC & Jean-Pierre Beauviala

4 - CAMERA: SENSOR, OLPF AND MTF

THE ROLE OF THE OLPF



OLPF: Optical Low-Pass Filter): blurs to keep away from aliasing

THE ROLE OF THE OLPF

Aliased



Anti-Aliased

4 - CAMERA: SENSOR, OLPF AND MTF

THE ROLE OF THE OLPF



Minimal aliasing

4 - CAMERA: SENSOR, OLPF AND MTF

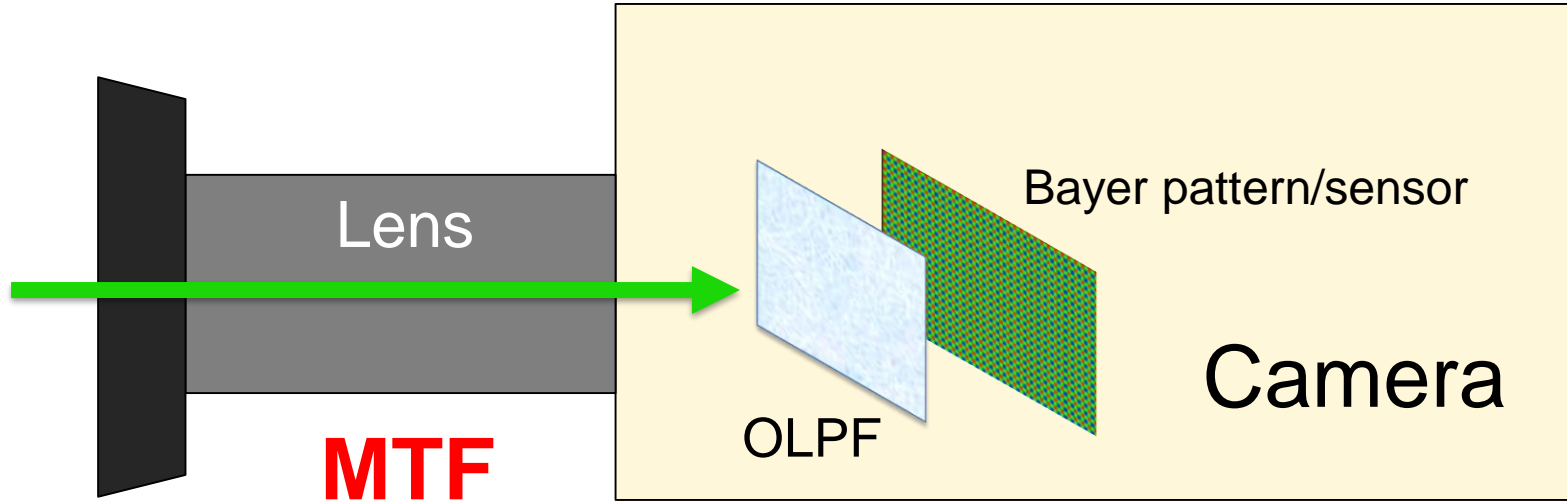
THE ROLE OF THE OLPF



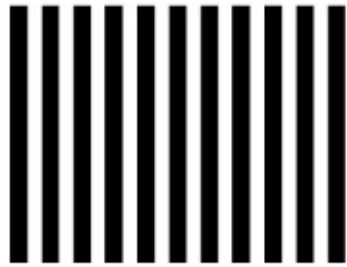
Strong aliasing

4 - CAMERA: SENSOR, OLPF AND MTF

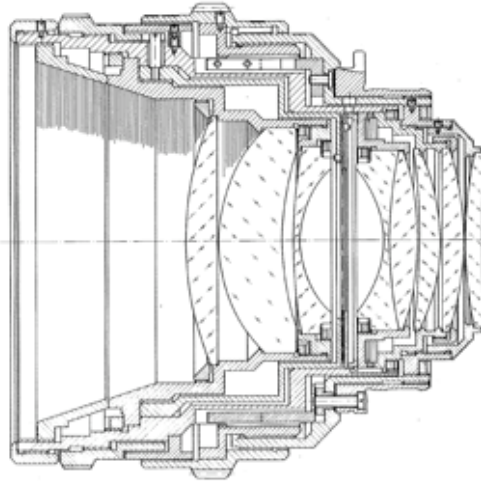
THE ROLE OF THE MTF



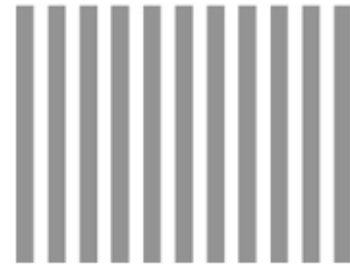
MTF ?



MODULATION

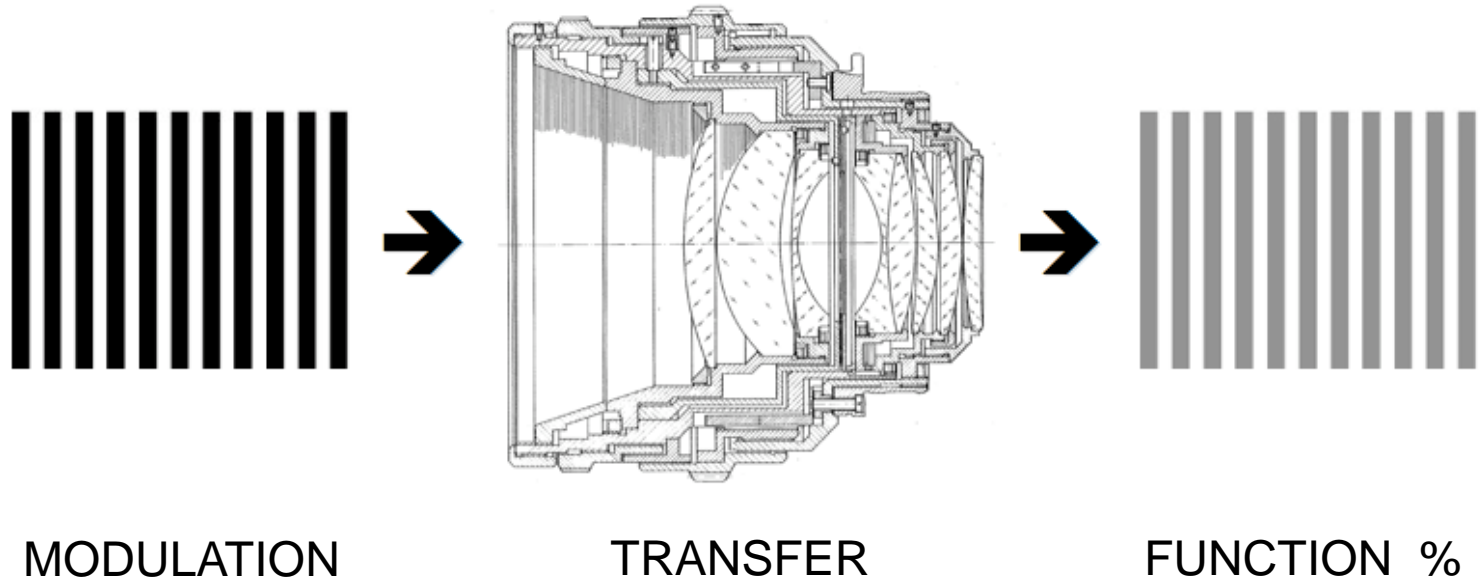


TRANSFER

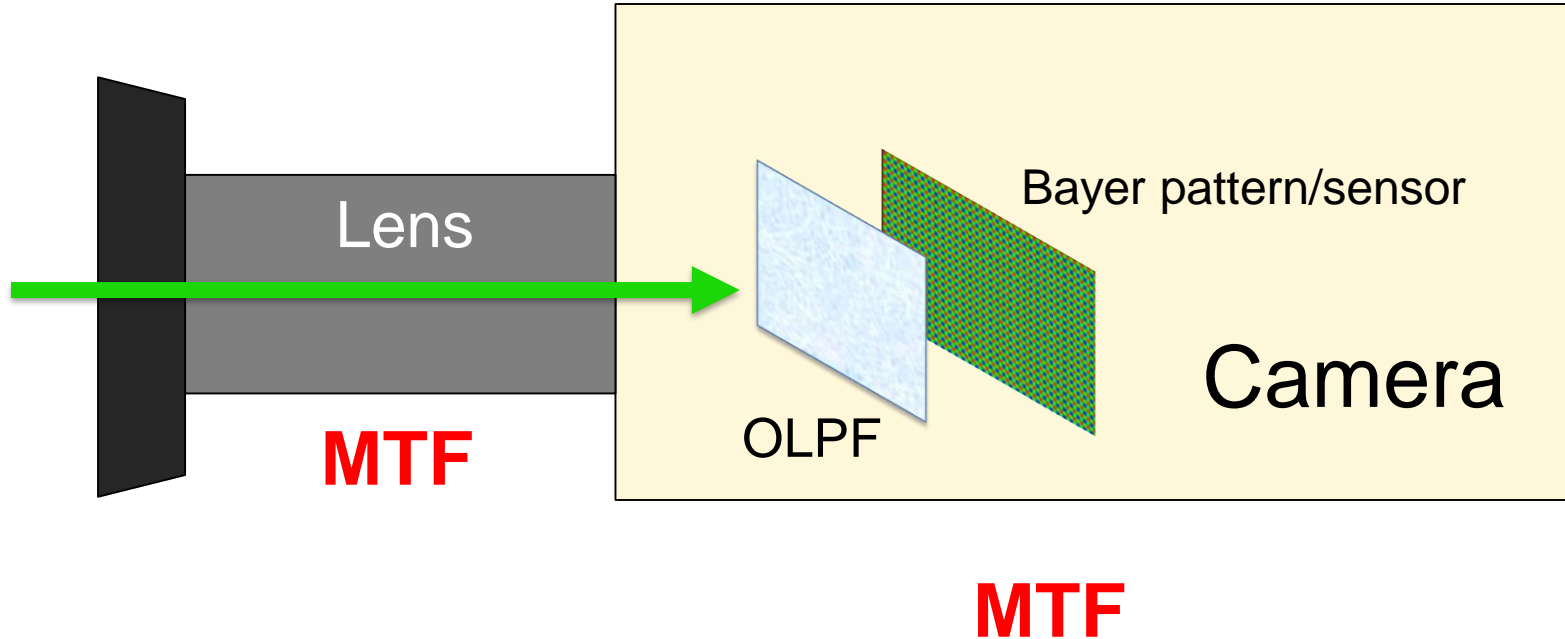


FUNCTION %

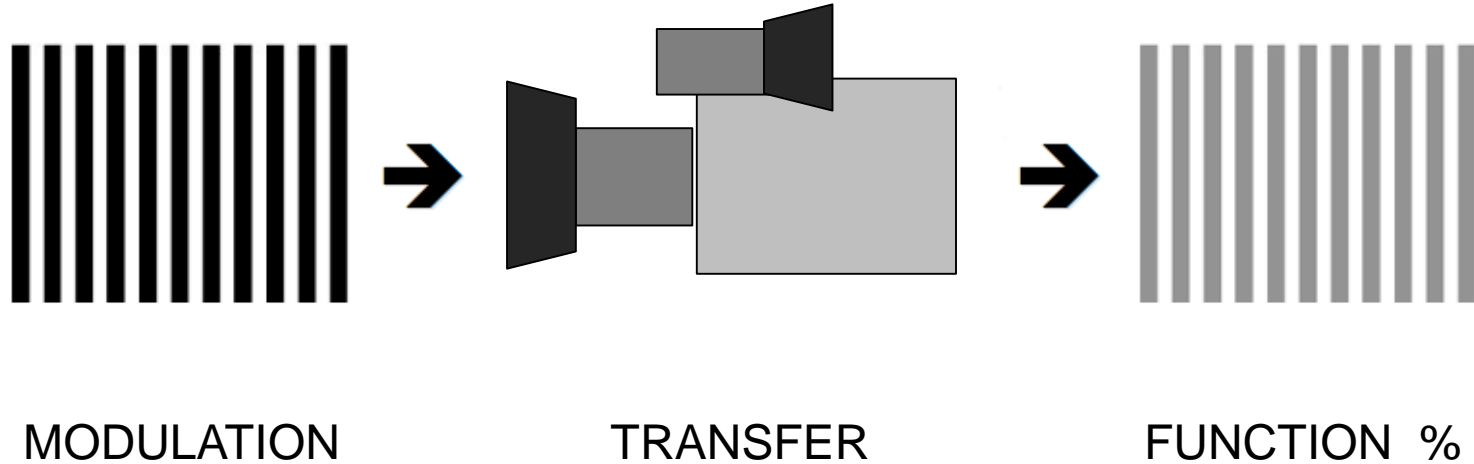
MTF - Only for lenses?



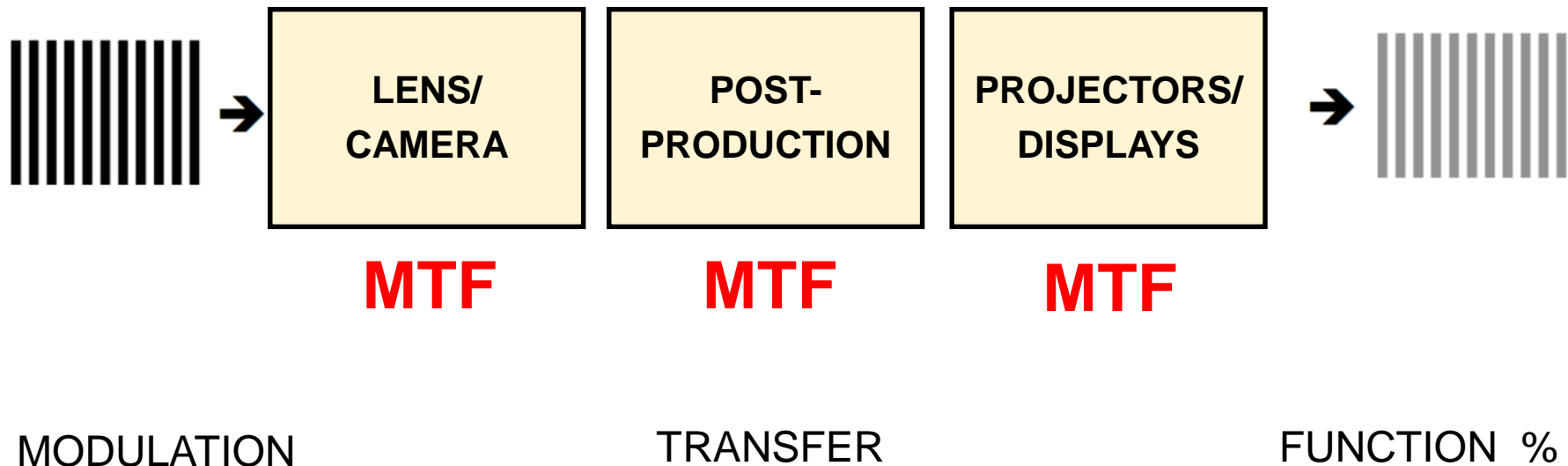
SEVERAL MTF



MTF - For camera



MTF - For the workflow

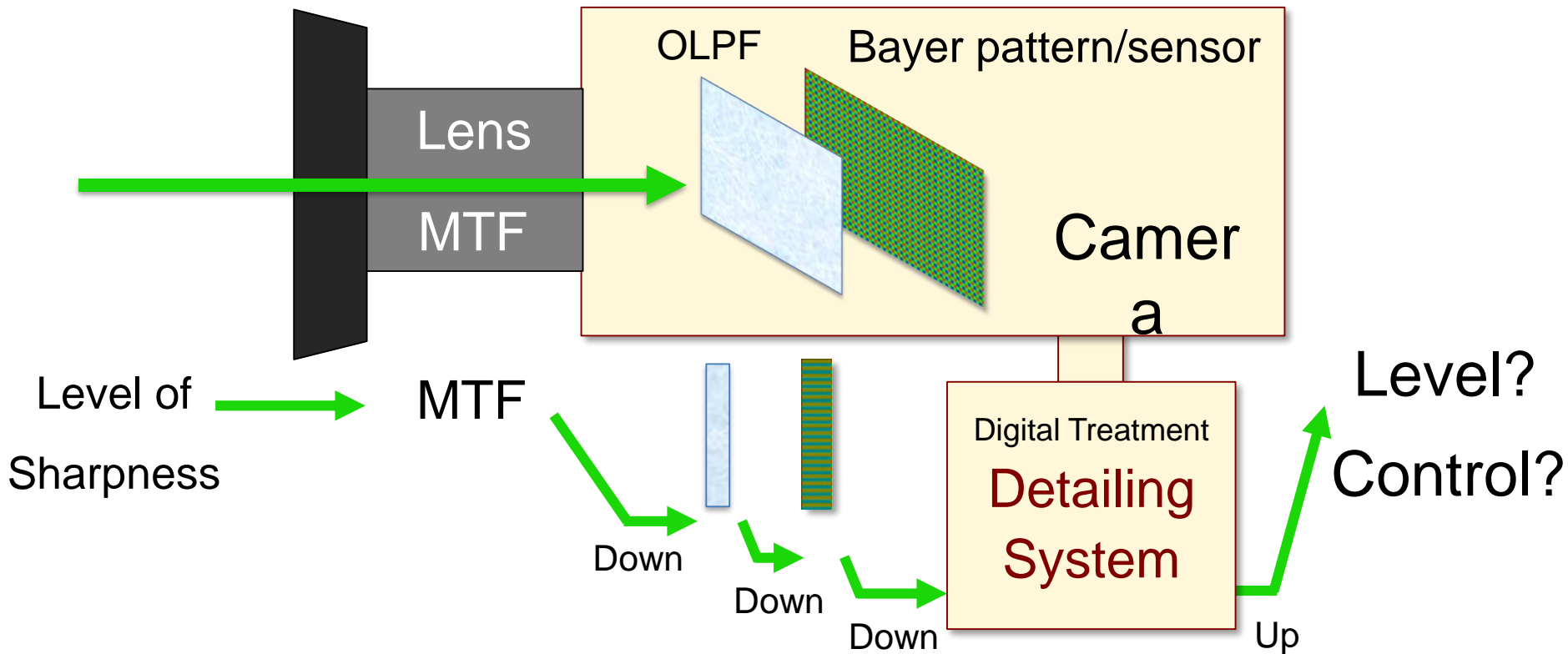


THE SHARPNESS AND THE 4K WORKFLOW

5 - THE ROLE OF THE DETAILING SYSTEM

IN CAMERA

5 - THE ROLE OF THE DETAILING PROCESS IN CAMERA

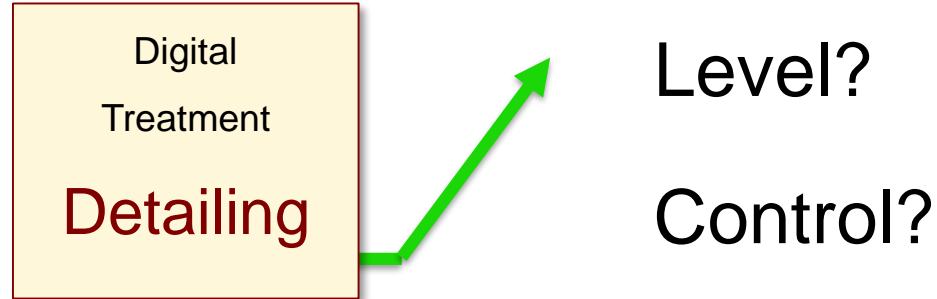


MTF: Modulation Transfer Function

5 - THE ROLE OF THE DETAILING PROCESS IN CAMERA

Due to the OLPF (among other parameters), there is an important need to increase the sharpening/detailing setting, internally for a codec or in post for raw materials. This is the role of the detailing system.

5 - THE ROLE OF THE DETAILING PROCESS IN CAMERA



Who is in charge to control the level of sharpness?

Engineers?

Cinematographers?

Colorists?

5 - THE ROLE OF THE DETAILING PROCESS IN CAMERA

TWO IMPORTANT CHARACTERISTICS OF DETAILING

- The detail level of an image is always easy to increase in post.
- But it's always very difficult and expensive to lower the detail level in post.

5 - THE ROLE OF THE DETAILING PROCESS IN CAMERA

FIRST CONCLUSIONS

- DETAIL PARAMETERS ARE DEFINED BY SKILLED ENGINEERS
- BUT DO THESE PARAMETERS FIT WITH ALL THE AESTHETIC WISHES OF FILMMAKERS?

5 - THE ROLE OF THE DETAILING PROCESS IN CAMERA

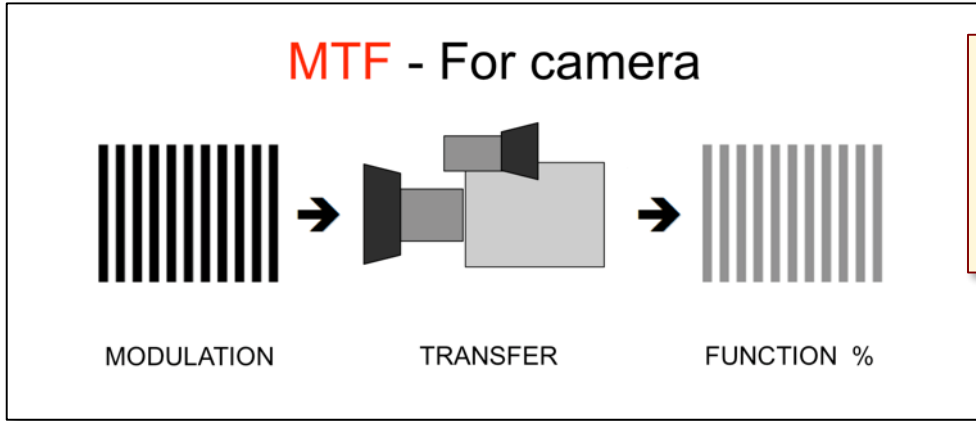
FIRST CONCLUSIONS

**CONTROLLING THE LEVEL OF DETAIL IS A KEY
PARAMETER IN THE PROCESS OF THE IMAGE TEXTURE**

THE SHARPNESS AND THE 4K WORKFLOW

6 - SHARPNESS & POST-PRODUCTION

6 - SHARPNESS & POST-PRODUCTION



Detailing
process

IN CAMERA FOR
CODEC

IN POST FOR RAW

Which level?

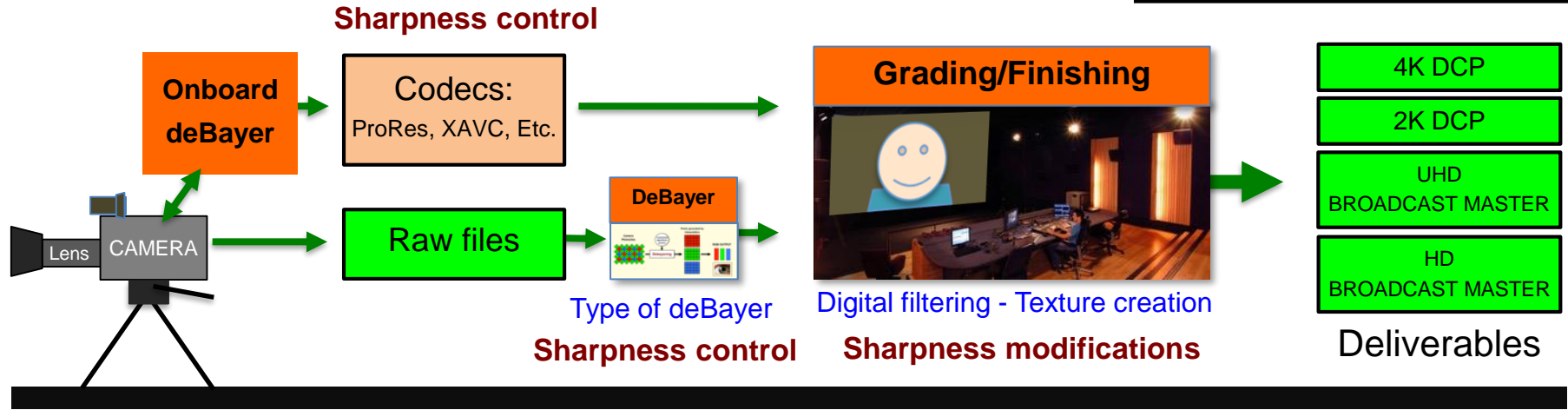
Who is in charge of the control?

Same question if we are shooting in Raw:

How can we choose a lens if we don't have access to this detailing process?

6 - SHARPNESS & POST-PRODUCTION

POST-PRODUCTION

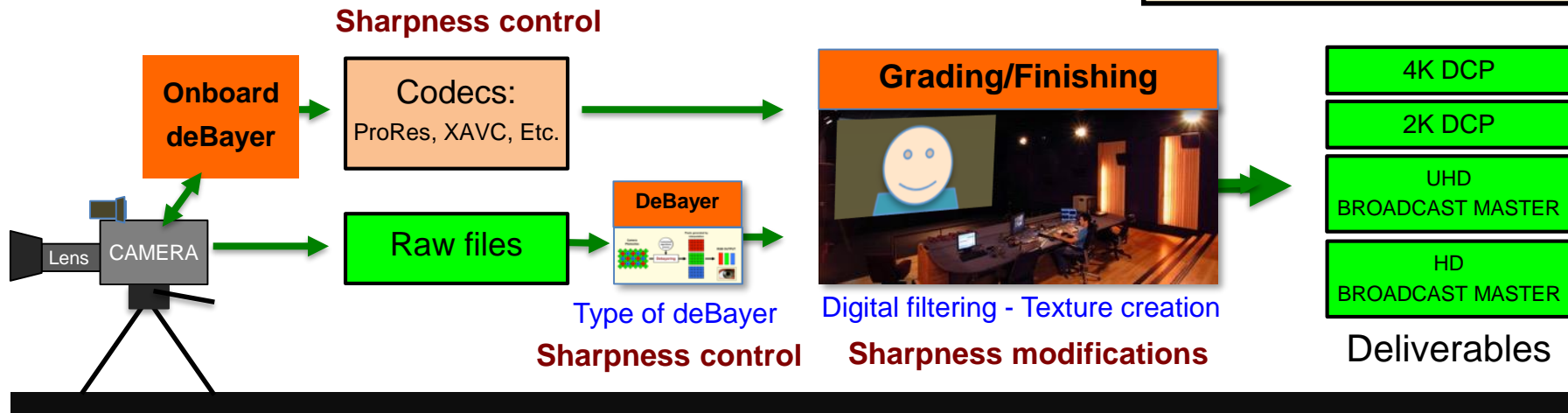


Parameters (w/o parameters of viewing distance)

- Type of recording
 - DeBayer
 - ✓ Onboard
 - ✓ Post-production
 - ✓ **Sharpness control**
 - Gamma encoding/Color mapping
- Grading
 - **Sharpness modifications**
 - ✓ "Refocus"/"Defocus"
 - ✓ Noise reduction
 - ✓ Texture creation - Grain (size/speed)
 - HDR
 - HFR (time resolution)

6 - SHARPNESS & POST-PRODUCTION

POST-PRODUCTION

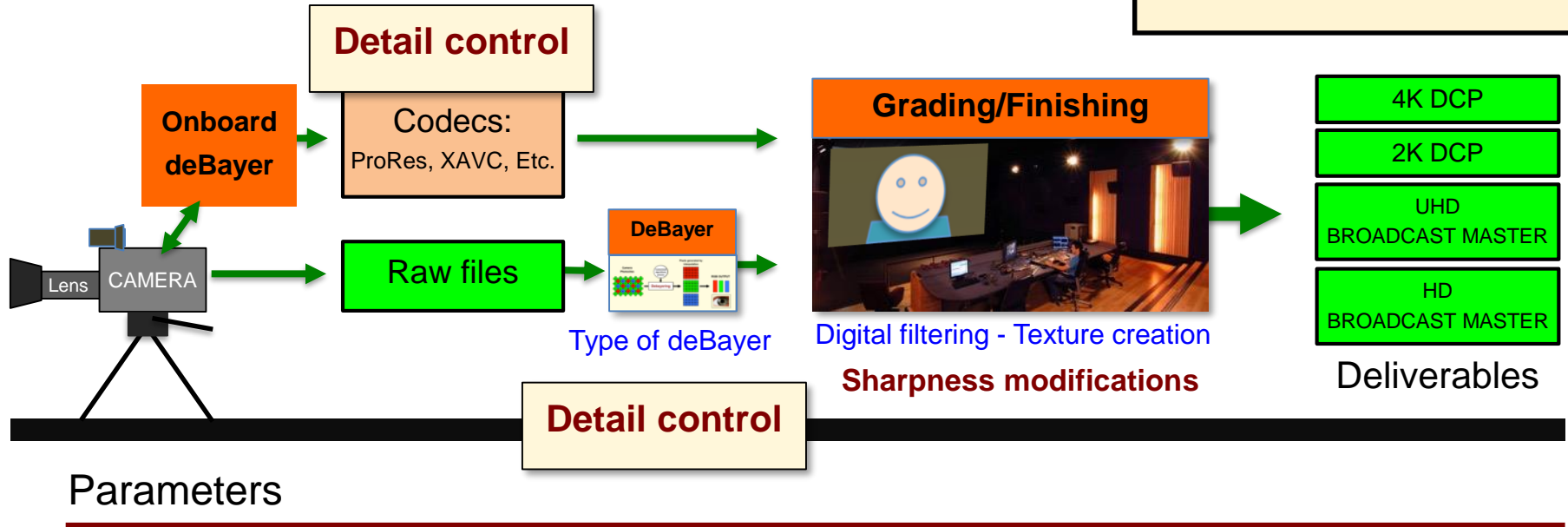


Parameters (w/o parameters of viewing distance)

TOO MANY PARAMETERS!

6 - SHARPNESS & POST-PRODUCTION

POST-PRODUCTION

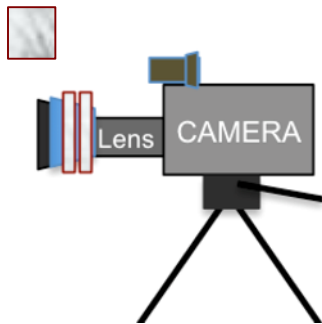


The sharpness (detail) control embedded in the deBayer process in post is not given by all manufacturers.

Example: Sony

6 - SHARPNESS & POST-PRODUCTION

SHOOTING & POST-PRODUCTION



GLASS FILTERING

VS

DIGITAL FILTERING

- Low cost
- Limitations:
 - ✓ Permanent alteration
 - ✓ Affects whole image
 - ✓ Issues when travelling from wide shot to close-up or vice versa.

- Infinite range of possibilities (area base filtering, luminance & hue)
- High costs
- Time consuming

PROS & CONS

HDR, HFR AND TEXTURE

- High Dynamic Range and High Frame Rate are influencing the perception of texture.
- No serious studies have been done on these new topics

THE SHARPNESS AND THE 4K WORKFLOW

7 - SHARPNESS & RELEASE

7 - SHARPNESS & RELEASE

RELEASE

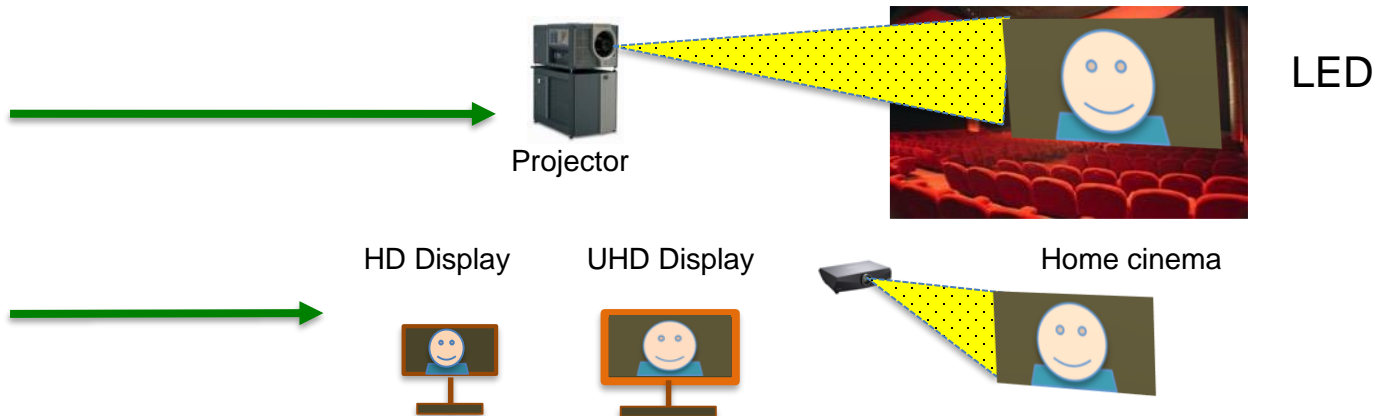
Deliverables

4K DCP

2K DCP

UHD
BROADCAST MASTER

HD
BROADCAST MASTER



Parameters (w/o parameters of viewing distance)

Wild West!

SCREENING projectors (DCI)

- Resolution
- Speed - HFR
- Type of projector (Laser)
- Sharpness decision by manufacturers
- HDR/Color space

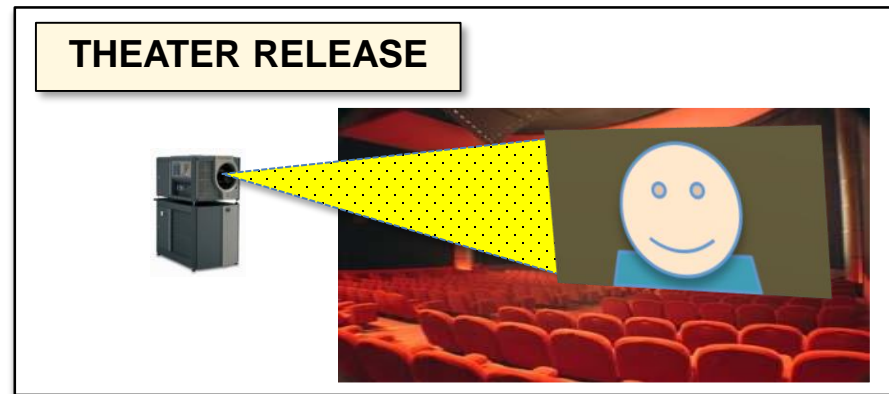
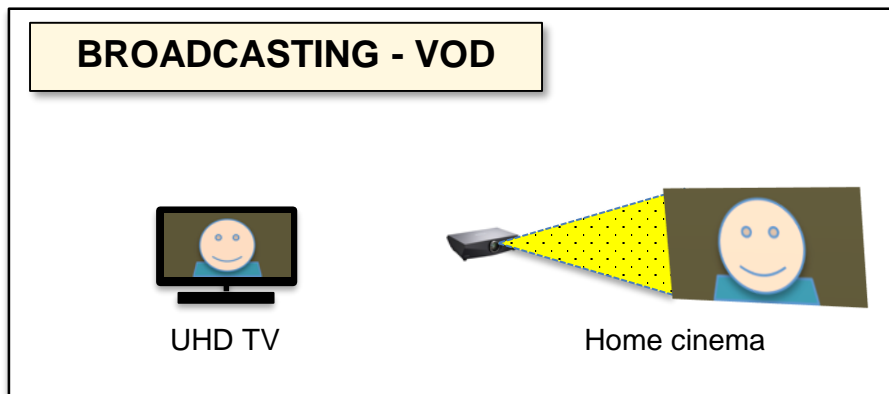
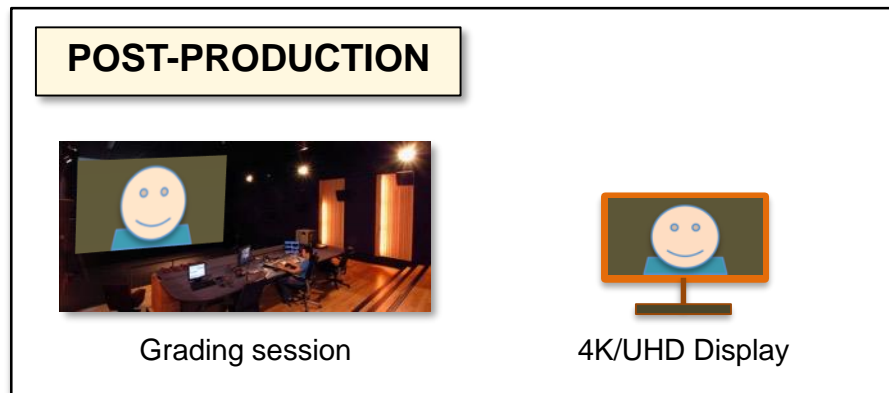
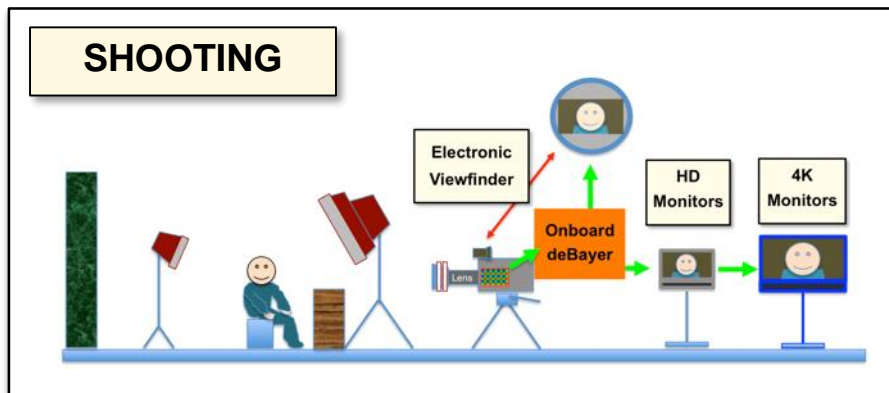
EMMISSIVE SCREENING - LED No standard

BROADCASTING

- Different types of transportation/compression
- Resolution
- Speed - HFR
- Types of displays
- HDR/Color space
- All parameters possible (Gamma, Cine Style, Sharpness, etc)

7 - SHARPNESS & RELEASE

SIZES & PERCEPTIONS



7 - SHARPNESS & RELEASE



- Different steps
 - Different sizes of screens
 - Different environments
 - Different perceptions

7 - SHARPNESS & RELEASE

- The texture and specifically the sharpness have to be checked through a simulation of the final release. For theater release only a large screen can give the level of sharpness.
- 4K screening or UHD large displays are changing our perceptions as spectator, they change cinematographers and postproducers and colourists methodologies.

THE SHARPNESS AND THE 4K WORKFLOW

8 - CAMERA & LENSES: THE PARADOX

CHOOSING LENSES

- Nowadays, choosing a set of lenses often becomes the most important phase of tests.
- The combination of camera and lenses became a new challenge.
- The 4K workflow highlights the flavour of the lenses in a more obvious way than the 2K one.

CONTROL OF THE TEXTURE

LENSES MANUFACTURERS STRATEGIES

- Lens manufacturers are working hard on the control of sharpness, bokeh and texture, but more easily, thanks to mathematics and algorithms.

CONTROL OF THE TEXTURE

LENSES MANUFACTURERS STRATEGIES

- The new larger sensors (Red, Arri, Sony, Canon) as well as the new lenses (Leica, Zeiss, Arri, Panavision) for these new cameras should lead to new strategies to control the unwanted oversharppness

8 - CAMERA & LENSES: THE PARADOX

CONTROL OF THE TEXTURE

LENSES MANUFACTURERS STRATEGIES

- “Clever” lenses - Cooke /i
- “Clever” lenses - Arri/Zeiss LDS
- “Clever” lenses - Panavision
- “Clever” lenses - Zeiss eXtended Data

VINTAGE LENSES AND DIGITAL CAMERAS

A COMPLEX STORY

VINTAGE LENSES AND DIGITAL CAMERAS

- Many cinematographers are often using vintage lenses to create a look, but more often, it is for lowering the crisp look of several cameras.
- Question: Are we creating a look or are we fighting against the machine, or both?

8 - CAMERA & LENSES: THE PARADOX

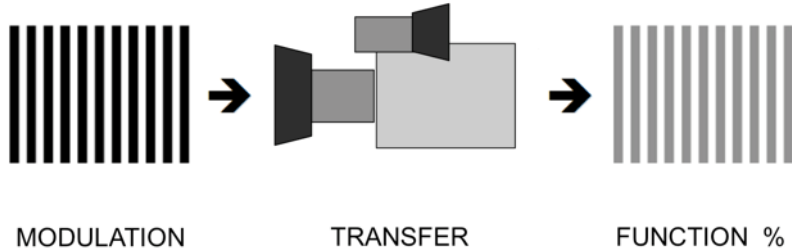


Question: Are we sure that we know all the parameters of texture given by the camera?

CAMERA & LENSES: THE INTERESTING MARRIAGE

8 - CAMERA & LENSES: THE PARADOX

MTF - For camera



Detailing
Process

Wich level?
Who is in charge
of the control?

Question:

How can we choose a lens if we don't have access to this detailing parameter?

THE SHARPNESS AND THE 4K WORKFLOW

9 - TEXTURE CONTROL - WHICH TOOLS?

9 - TEXTURE CONTROL - WHICH TOOLS?

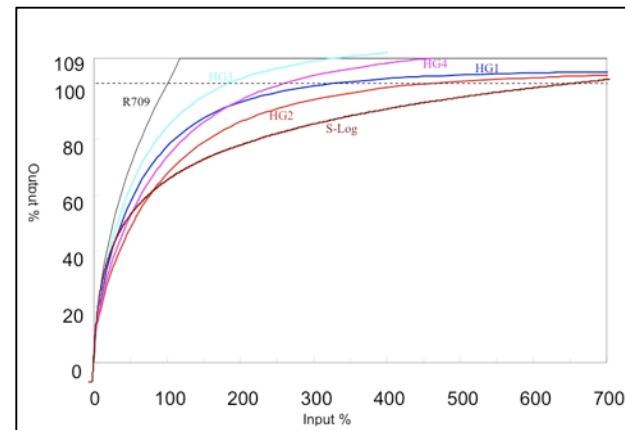
CAMERA

EXAMPLES: SONY

An interesting step for the texture has been given by SONY several years ago to create gamma encoding

The CVP FILE EDITOR customized
Gamma curve

The gamma encoding plays an
important role in the perception of
sharpness



9 - TEXTURE CONTROL - WHICH TOOLS?

CAMERA

EXAMPLES: SONY

New parameters ?

Not really, the first HD ENG cameras starting with the Sony F900 provided through the PAINT MENU a lot of control on the perception of sharpness.

PAINT		DETAIL LEVEL 1	
	MASTER	WHT	BLK
LEVEL	- 50	////////	////////
LIMITER	-99	+99	0,0
CRISP	-70	H/V RATIO	0,0
H FREQ	-99	LEVEL DEP	0,0
DETAIL	ON	LEVEL DEP	OFF

PAINT		DETAIL LEVEL 2	
KNEE APERTURE LVL		0.0	
KNEE APERT		OFF	

9 - TEXTURE CONTROL - WHICH TOOLS?



CAMERA

EXAMPLES:

A first step already given by camera manufacturers:

- On some codecs:
 - ✓ ARRI on Mini and Amira with ProRes, see chapter 12
 - ✓ SONY with XAVC, but with limitations to lower the details

9 - TEXTURE CONTROL - WHICH TOOLS?

IN POST

EXAMPLES:

A first step already given by camera manufacturers:

- On RAW footage in post:
Access to control of sharpness during deBayer with: ARRI,
RED, PANAVISION, CANON, PANASONIC

9 - TEXTURE CONTROL - WHICH TOOLS?

IN POST

EXAMPLES:

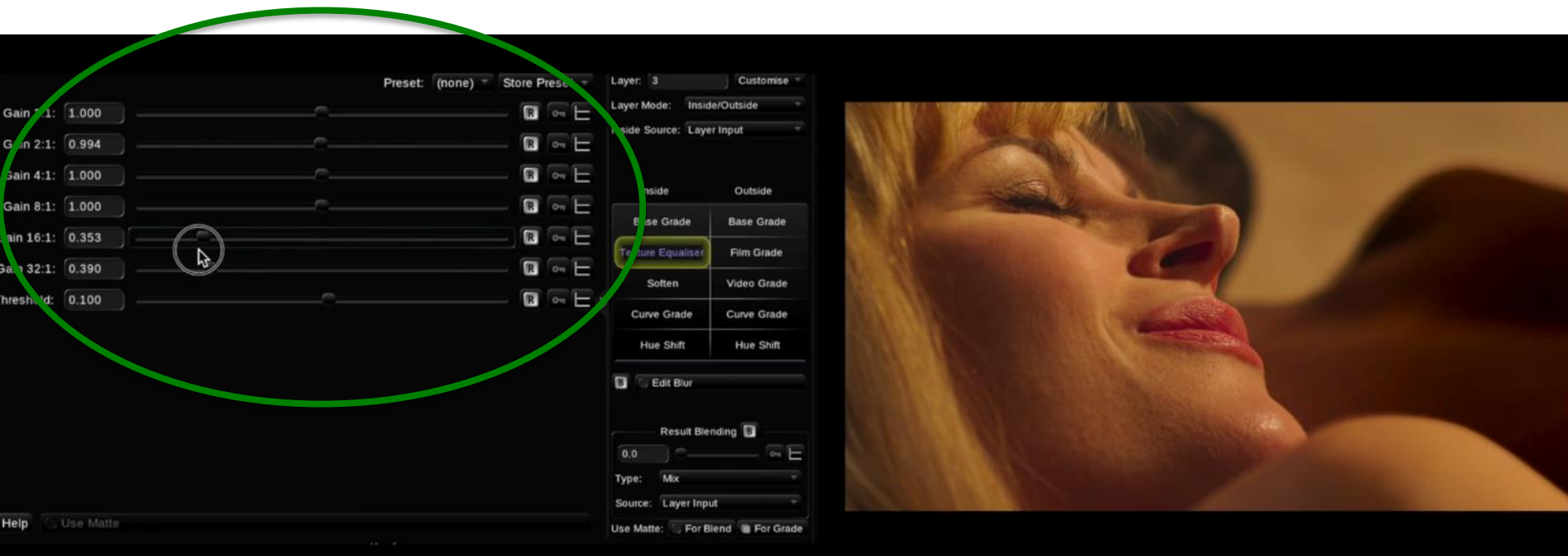
Some post tools:

- BASELIGHT:
THE NEW TEXTURE EQUALISER OPERATOR
- DAVINCI:
RESOLVE FX FACE REFINEMENT

9 - TEXTURE CONTROL - WHICH TOOLS?

IN POST

EXAMPLES: BASELIGHT TEXTURE EQUALISATION



FREQUENCY-BASED SOFTENING/SHARPENING

EXAMPLES: **BASELIGHT**

THE NEW TEXTURE EQUALISER OPERATOR 1/2

How to reduce and to control the sharpness

The new Texture Equaliser operator divides the image into a set of spatial frequency bands. Each frequency band has a separate Gain control. Each Gain control scales the signal in its frequency band. This can be used to smooth or enhance textures such as flesh tones in each band.

The default 1.0 setting gives no scaling.

The threshold setting puts a soft limit on the gain. Sharp features such as edges have a large component in each band. We do not usually want to change the gain on these features.

The default setting allows us to change our textures, without changing the sharp features too much.

9 - TEXTURE CONTROL WHICH TOOLS?

BASELIGHT

IN POST

THE NEW TEXTURE EQUALISER OPERATOR

GAIN: ALL RESET

Gain 1:1: 1.000

Gain 2:1: 1.000

Gain 4:1: 1.000

Gain 8:1: 1.000

Gain 16:1: 1.000

Gain 32:1: 1.000

Threshold: 0.100



9 - TEXTURE CONTROL WHICH TOOLS?

BASELIGHT

IN POST

THE NEW TEXTURE EQUALISER OPERATOR

GAIN 1.1

Gain 1:1: 1.500

Gain 2:1: 1.000

Gain 4:1: 1.000

Gain 8:1: 1.000

Gain 16:1: 1.000

Gain 32:1: 1.000

Threshold: 1.000



9 - TEXTURE CONTROL WHICH TOOLS?

BASELIGHT

IN POST

THE NEW TEXTURE EQUALISER OPERATOR

GAIN 1.1

Gain 1:1: 2.000
Gain 2:1: 1.000
Gain 4:1: 1.000
Gain 8:1: 1.000
Gain 16:1: 1.000
Gain 32:1: 1.000
Threshold: 1.000



Name: Texture Equaliser Start: 01:07:03.03 End: 01:07:08.03 Len: 00:00:05.00 Row: 1

Gain 1:1: 2.000
Gain 2:1: 1.000
Gain 4:1: 1.000
Gain 8:1: 1.000
Gain 16:1: 1.000
Gain 32:1: 1.000
Threshold: 0.100

Help Use Matte

Keyframes

Show All

Preset: (none) Store Preset

Auto Edit Strip KFs

9 - TEXTURE CONTROL WHICH TOOLS?

BASELIGHT

IN POST

THE NEW TEXTURE EQUALISER OPERATOR

GAIN 1.1

Gain 1:1: 0.500
Gain 2:1: 1.000
Gain 4:1: 1.000
Gain 8:1: 1.000
Gain 16:1: 1.000
Gain 32:1: 1.000
Threshold: 1.000



Name: Texture Equaliser Start: 01:07:03.03 End: 01:07:08.03 Len: 00:00:05.00 Row: 1

Gain 1:1: 0.500
Gain 2:1: 1.000
Gain 4:1: 1.000
Gain 8:1: 1.000
Gain 16:1: 1.000
Gain 32:1: 1.000
Threshold: 0.100

Help Use Matte

Keyframes

Show All

Preset: (none) Store Preset

Auto Edit Strip KFs

9 - TEXTURE CONTROL WHICH TOOLS?

BASELIGHT

IN POST

THE NEW TEXTURE EQUALISER OPERATOR

GAIN 1.1

Gain 1:1: 0.000

Gain 2:1: 1.000

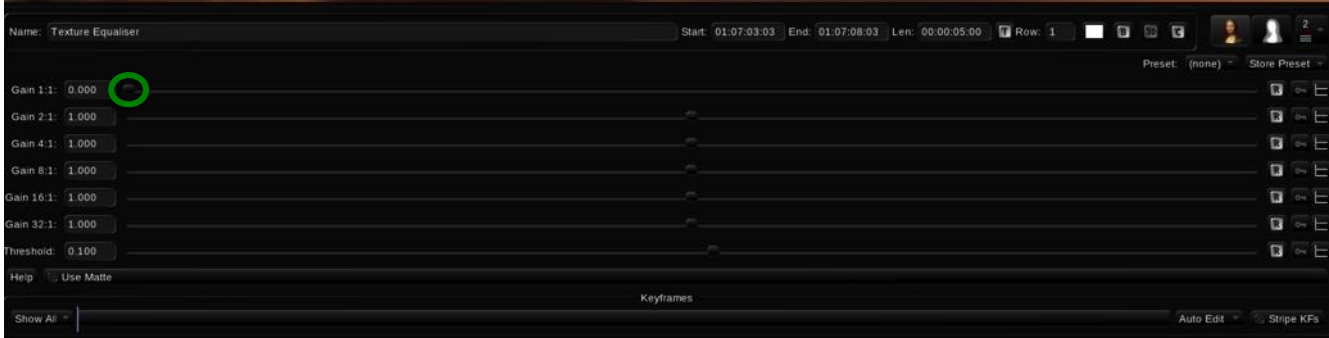
Gain 4:1: 1.000

Gain 8:1: 1.000

Gain 16:1: 1.000

Gain 32:1: 1.000

Threshold: 1.000



9 - TEXTURE CONTROL WHICH TOOLS?

BASELIGHT

IN POST

THE NEW TEXTURE EQUALISER OPERATOR

GAIN 2.1



9 - TEXTURE CONTROL WHICH TOOLS?

BASELIGHT

IN POST

THE NEW TEXTURE EQUALISER OPERATOR

GAIN 2.1



9 - TEXTURE CONTROL WHICH TOOLS?

BASELIGHT

IN POST

THE NEW TEXTURE EQUALISER OPERATOR

GAIN 2.1



9 - TEXTURE CONTROL WHICH TOOLS?

BASELIGHT

IN POST

THE NEW TEXTURE EQUALISER OPERATOR

GAIN 2.1



9 - TEXTURE CONTROL WHICH TOOLS?

BASELIGHT

IN POST

THE NEW TEXTURE EQUALISER OPERATOR

GAIN 4.1

Gain 1:1: 1.000
Gain 2:1: 1.000
Gain 4:1: 1.500
Gain 8:1: 1.000
Gain 16:1: 1.000
Gain 32:1: 1.000
Threshold: 1.000



Name: Texture Equaliser Start: 01:07:03.03 End: 01:07:08.03 Len: 00:00:05.00 Row: 1

Preset: (none) Store Preset

Gain 1:1: 1.000
Gain 2:1: 1.000
Gain 4:1: 1.500
Gain 8:1: 1.000
Gain 16:1: 1.000
Gain 32:1: 1.000
Threshold: 0.100

Help Use Matte

Keyframes

Show All Auto Edit Strip KFs

9 - TEXTURE CONTROL WHICH TOOLS?

BASELIGHT

IN POST

THE NEW TEXTURE EQUALISER OPERATOR

GAIN 4.1



9 - TEXTURE CONTROL WHICH TOOLS?

BASELIGHT

IN POST

THE NEW TEXTURE EQUALISER OPERATOR

GAIN 4.1



9 - TEXTURE CONTROL WHICH TOOLS?

BASELIGHT

IN POST

THE NEW TEXTURE EQUALISER OPERATOR

GAIN 4.1



9 - TEXTURE CONTROL WHICH TOOLS?

BASELIGHT

IN POST

THE NEW TEXTURE EQUALISER OPERATOR

GAIN 8.1

Gain 1:1: 1.000
Gain 2:1: 1.000
Gain 4:1: 1.000
Gain 8:1: 1.500
Gain 16:1: 1.000
Gain 32:1: 1.000
Threshold: 1.000



Name: Texture Equaliser Start: 01:07:03.03 End: 01:07:08.03 Len: 00:00:05.00 Row: 1

Gain 1:1: 1.000
Gain 2:1: 1.000
Gain 4:1: 1.000
Gain 8:1: 1.500
Gain 16:1: 1.000
Gain 32:1: 1.000
Threshold: 0.100

Help Use Matte

Keyframes

Show All

Preset: (none) Store Preset

Auto Edit Strip KFs

9 - TEXTURE CONTROL WHICH TOOLS?

BASELIGHT

IN POST

THE NEW TEXTURE EQUALISER OPERATOR

GAIN 8.1

Gain 1:1: 1.000
Gain 2:1: 1.000
Gain 4:1: 1.000
Gain 8:1: 2.000
Gain 16:1: 1.000
Gain 32:1: 1.000
Threshold: 1.000



Name: Texture Equaliser Start: 01:07:03.03 End: 01:07:08.03 Len: 00:00:05.00 Row: 1

Gain 1:1: 1.000
Gain 2:1: 1.000
Gain 4:1: 1.000
Gain 8:1: 2.000
Gain 16:1: 1.000
Gain 32:1: 1.000
Threshold: 0.100

Use Matte

Keyframes

Show All

Preset: (none) Store Preset

9 - TEXTURE CONTROL WHICH TOOLS?

BASELIGHT

IN POST

THE NEW TEXTURE EQUALISER OPERATOR

GAIN 8.1

Gain 1:1: 1.000
Gain 2:1: 1.000
Gain 4:1: 1.000
Gain 8:1: 0.500
Gain 16:1: 1.000
Gain 32:1: 1.000
Threshold: 1.000



Name: Texture Equaliser Start: 01:07:03.03 End: 01:07:08.03 Len: 00:00:05.00 Row: 1

Gain 1:1: 1.000
Gain 2:1: 1.000
Gain 4:1: 1.000
Gain 8:1: 0.500
Gain 16:1: 1.000
Gain 32:1: 1.000
Threshold: 0.100

Help Use Matte

Keyframes

Show All

Preset: (none) Store Preset

Auto Edit Strip KFs

9 - TEXTURE CONTROL WHICH TOOLS?

BASELIGHT

IN POST

THE NEW TEXTURE EQUALISER OPERATOR

GAIN 8.1



9 - TEXTURE CONTROL WHICH TOOLS?

BASELIGHT

IN POST

THE NEW TEXTURE EQUALISER OPERATOR

GAIN 16.1

Gain 1:1: 1.000

Gain 2:1: 1.000

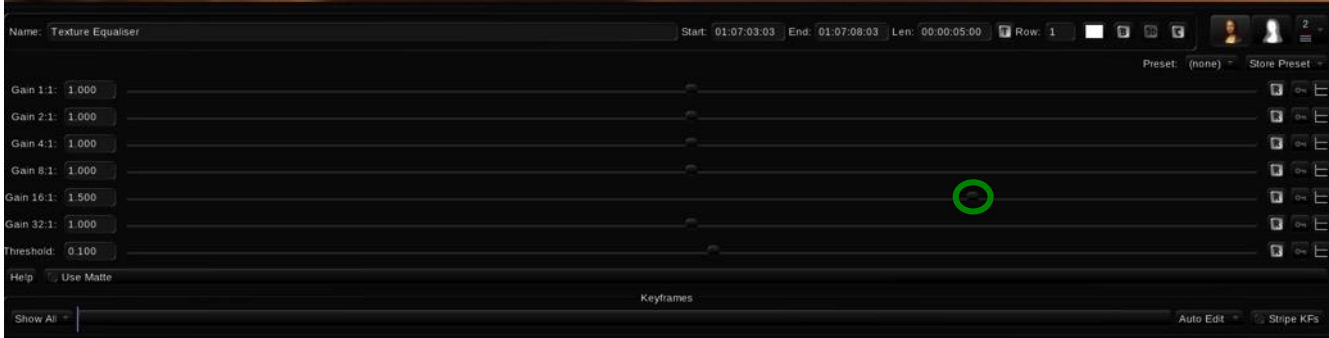
Gain 4:1: 1.000

Gain 8:1: 1.000

Gain 16:1: 1.500

Gain 32:1: 1.000

Threshold: 1.000



9 - TEXTURE CONTROL WHICH TOOLS?

BASELIGHT

IN POST

THE NEW TEXTURE EQUALISER OPERATOR

GAIN 16.1

Gain 1:1: 1.000

Gain 2:1: 1.000

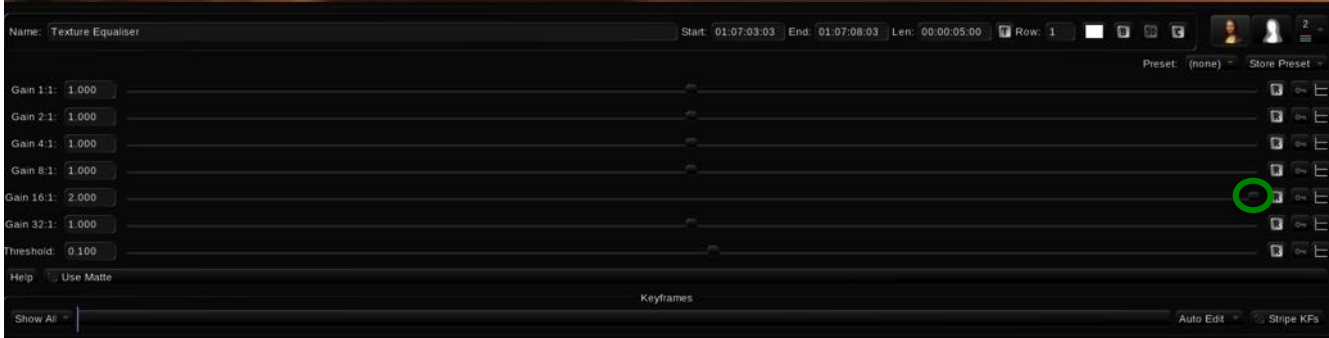
Gain 4:1: 1.000

Gain 8:1: 1.000

Gain 16:1: 2.000

Gain 32:1: 1.000

Threshold: 1.000



9 - TEXTURE CONTROL WHICH TOOLS?

BASELIGHT

IN POST

THE NEW TEXTURE EQUALISER OPERATOR

GAIN 16:1

Gain 1:1: 1.000

Gain 2:1: 1.000

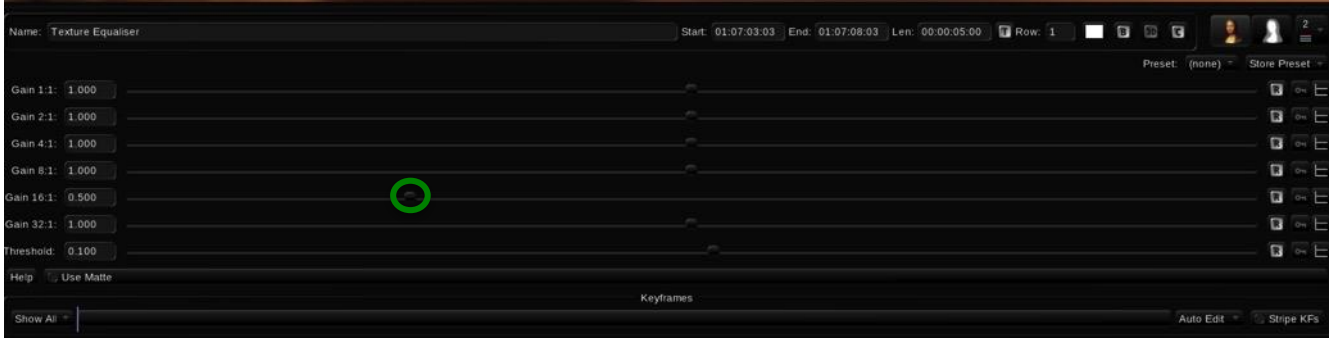
Gain 4:1: 1.000

Gain 8:1: 1.000

Gain 16:1: 0.500

Gain 32:1: 1.000

Threshold: 1.000



9 - TEXTURE CONTROL WHICH TOOLS?

BASELIGHT

IN POST

THE NEW TEXTURE EQUALISER OPERATOR

GAIN 16:1

Gain 1:1: 1.000

Gain 2:1: 1.000

Gain 4:1: 1.000

Gain 8:1: 1.000

Gain 16:1: 0.000

Gain 32:1: 1.000

Threshold: 1.000



9 - TEXTURE CONTROL WHICH TOOLS?

BASELIGHT

IN POST

THE NEW TEXTURE EQUALISER OPERATOR

GAIN 32.1

Gain 1:1: 1.000

Gain 2:1: 1.000

Gain 4:1: 1.000

Gain 8:1: 1.000

Gain 16:1: 1.000

Gain 32:1: 1.500

Threshold: 1.000



Name: Texture Equaliser Start: 01:07:03.03 End: 01:07:08.03 Len: 00:00:05.00 Row: 1

Preset: (none) Store Preset

Gain 1:1: 1.000

Gain 2:1: 1.000

Gain 4:1: 1.000

Gain 8:1: 1.000

Gain 16:1: 1.000

Gain 32:1: 1.500

Threshold: 0.100

Help Use Matte

Keyframes

Show All

Auto Edit Strip KFs

9 - TEXTURE CONTROL WHICH TOOLS?

BASELIGHT

IN POST

THE NEW TEXTURE EQUALISER OPERATOR

GAIN 32.1

Gain 1:1: 1.000
Gain 2:1: 1.000
Gain 4:1: 1.000
Gain 8:1: 1.000
Gain 16:1: 1.000
Gain 32:1: 2.000
Threshold: 1.000



Name: Texture Equaliser Start: 01:07:03.03 End: 01:07:08.03 Len: 00:00:05.00 Row: 1

Gain 1:1: 1.000
Gain 2:1: 1.000
Gain 4:1: 1.000
Gain 8:1: 1.000
Gain 16:1: 1.000
Gain 32:1: 2.000
Threshold: 0.100

Help Use Matte

Keyframes

Show All

Preset: (none) Store Preset

Auto Edit Strip KFs

9 - TEXTURE CONTROL WHICH TOOLS?

BASELIGHT

IN POST

THE NEW TEXTURE EQUALISER OPERATOR

GAIN 32.1

Gain 1:1: 1.000

Gain 2:1: 1.000

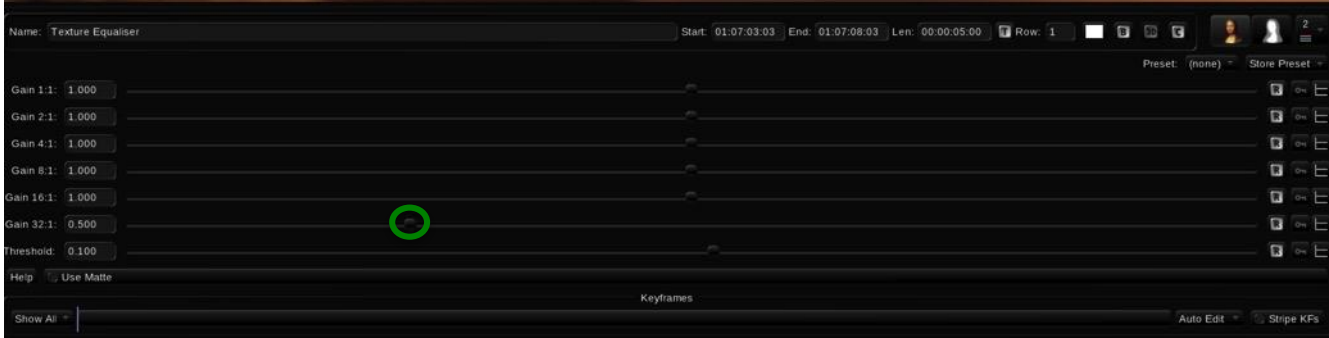
Gain 4:1: 1.000

Gain 8:1: 1.000

Gain 16:1: 1.000

Gain 32:1: 0.500

Threshold: 1.000



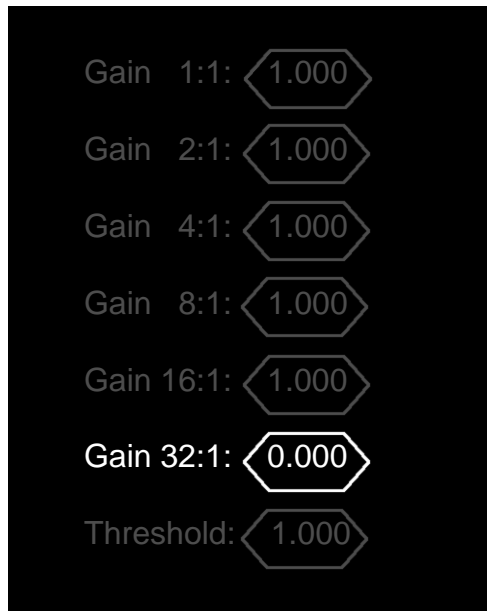
9 - TEXTURE CONTROL WHICH TOOLS?

BASELIGHT

IN POST

THE NEW TEXTURE EQUALISER OPERATOR

GAIN 32.1



9 - TEXTURE CONTROL WHICH TOOLS?

BASELIGHT

IN POST

THE NEW TEXTURE EQUALISER OPERATOR

FINAL SETTINGS

Gain 1:1: 1.258

Gain 2:1: 0.863

Gain 4:1: 0.740

Gain 8:1: 0.650

Gain 16:1: 0.621

Gain 32:1: 1.042

Threshold: 0.027



9 - TEXTURE CONTROL WHICH TOOLS?

BASELIGHT

IN POST

THE NEW TEXTURE EQUALISER OPERATOR

GAIN: ALL RESET

Gain 1:1: 1.000

Gain 2:1: 1.000

Gain 4:1: 1.000

Gain 8:1: 1.000

Gain 16:1: 1.000

Gain 32:1: 1.000

Threshold: 0.100



EXAMPLES: **BASELIGHT**

The new Texture Equaliser operator 2/2

Example: If we reduce the Gain on the 2:1, 4:1 and 8:1 bands, this will smooth skin tones, but preserve the texture of the pores and other fine detail. Increasing the Gain on the 16:1 band may restore some of the shadow modelling. Use a mask to restrict the filter to the face we wish to smooth.

You can download a free version to test it: Prelight, Option Free License.

<https://www.filmlight.ltd.uk/store/>

Creating your project: Please choose FilmLight T-Log as preset to start correctly.

Tutorial on the **Texture Equaliser Operator** :

<https://vimeo.com/232314309>

9 - TEXTURE CONTROL - WHICH TOOLS?

IN POST

EXAMPLES: DAVINCI RESOLVE FX FACE REFINEMENT

With the courtesy of Erwan Le Cloirec
Post-production instructor/Founder of yakyakyak

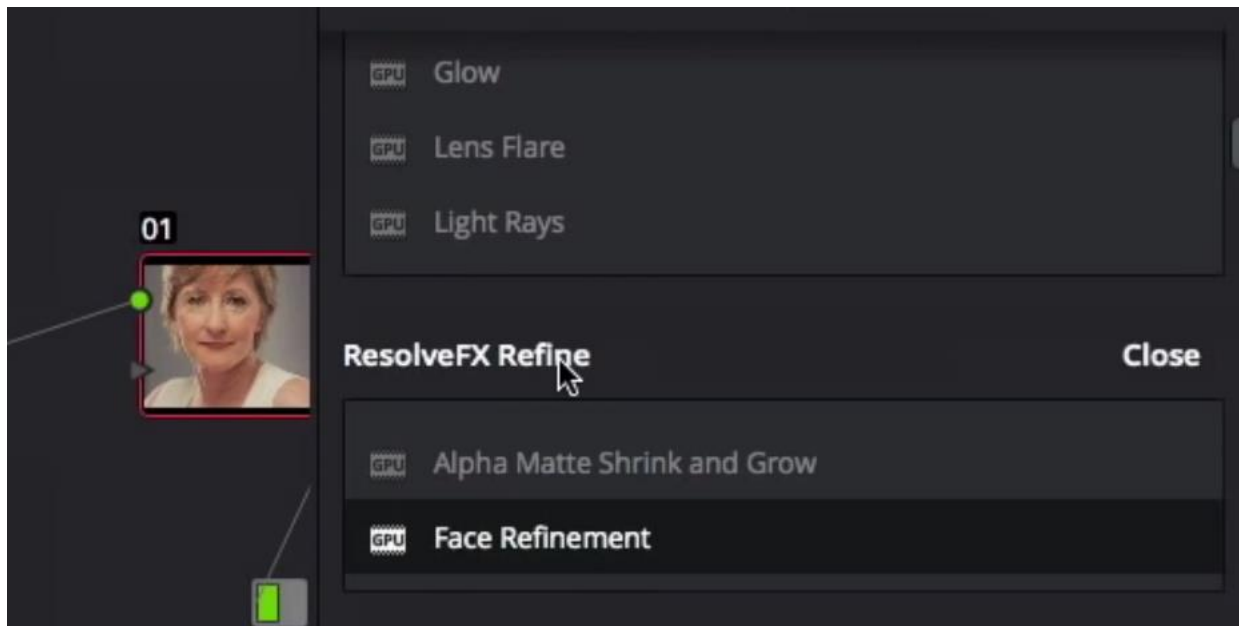
<http://yakyakyak.fr/>

<https://www.youtube.com/watch?v=2YUHLRYHR50>

9 - TEXTURE CONTROL - WHICH TOOLS?

IN POST

EXAMPLES: **DAVINCI** RESOLVE FX FACE REFINEMENT

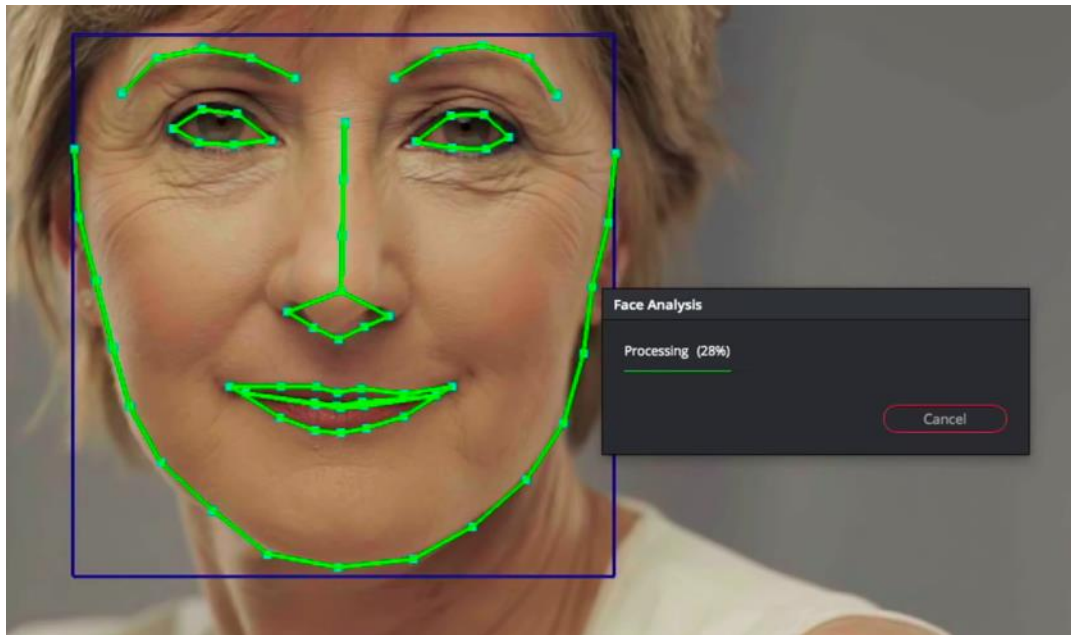


AUTOMATIC DETECTION

9 - TEXTURE CONTROL - WHICH TOOLS?

IN POST

EXAMPLES: **DAVINCI** RESOLVE FX FACE REFINEMENT

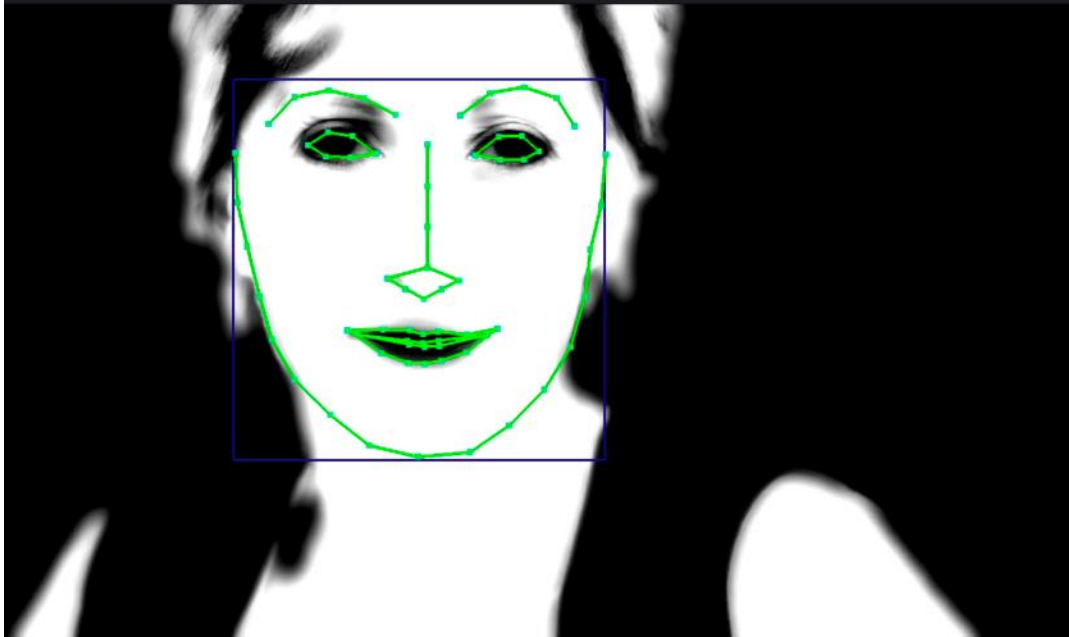


9 - TEXTURE CONTROL - WHICH TOOLS?

IN POST

CC

EXAMPLES: **DAVINCI** RESOLVE FX FACE REFINEMENT

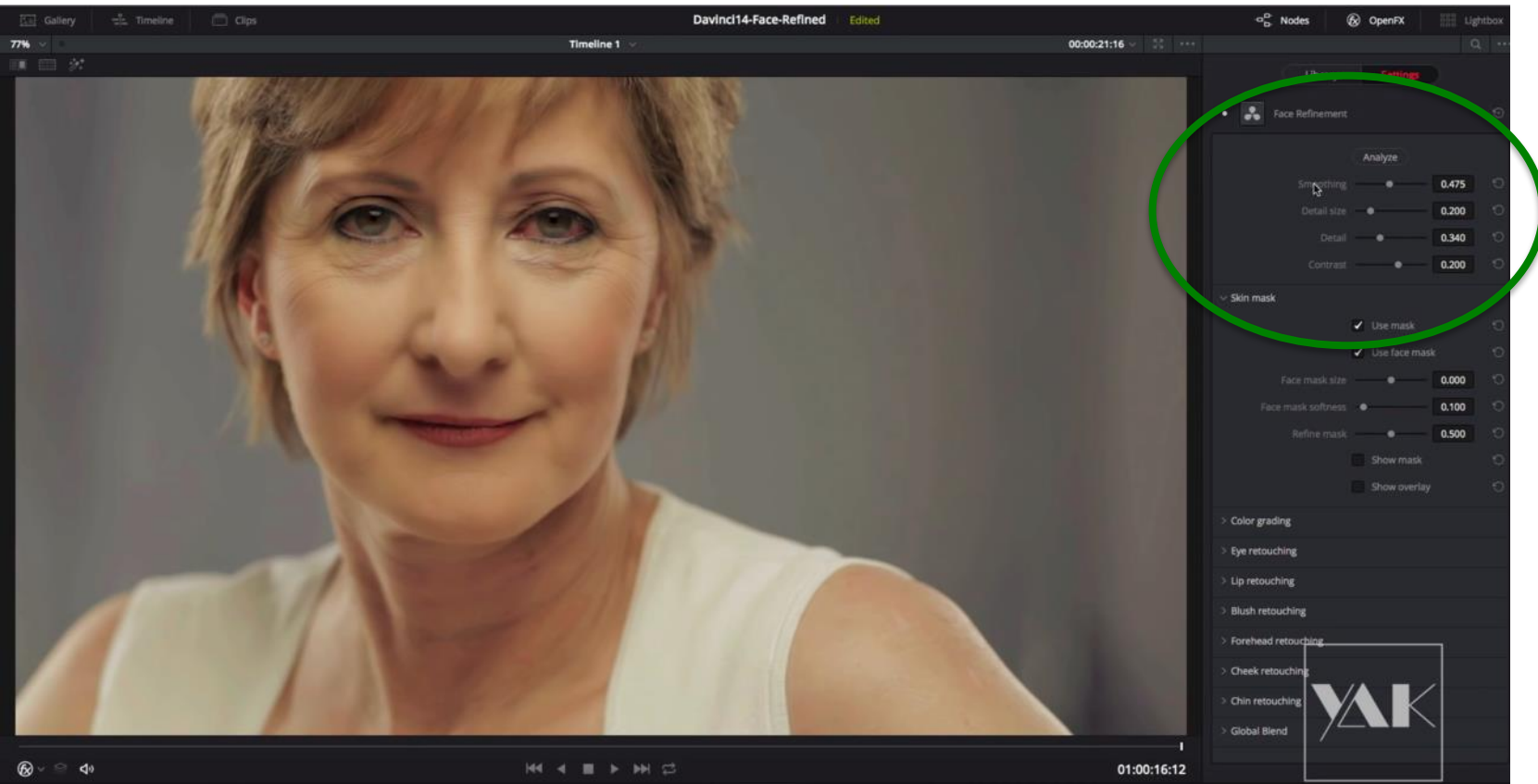


9 - TEXTURE CONTROL - WHICH TOOLS?

IN POST

CC

EXAMPLES: **DAVINCI** RESOLVE FX FACE REFINEMENT



9 - TEXTURE CONTROL - WHICH TOOLS?

IN POST

EXAMPLES: **DAVINCI** RESOLVE FX FACE REFINEMENT

The screenshot displays the DaVinci Resolve software interface. The main window shows a video clip of a woman's face. On the right side, the 'Face Refinement' tool settings are visible, highlighted with a green circle. The settings include:

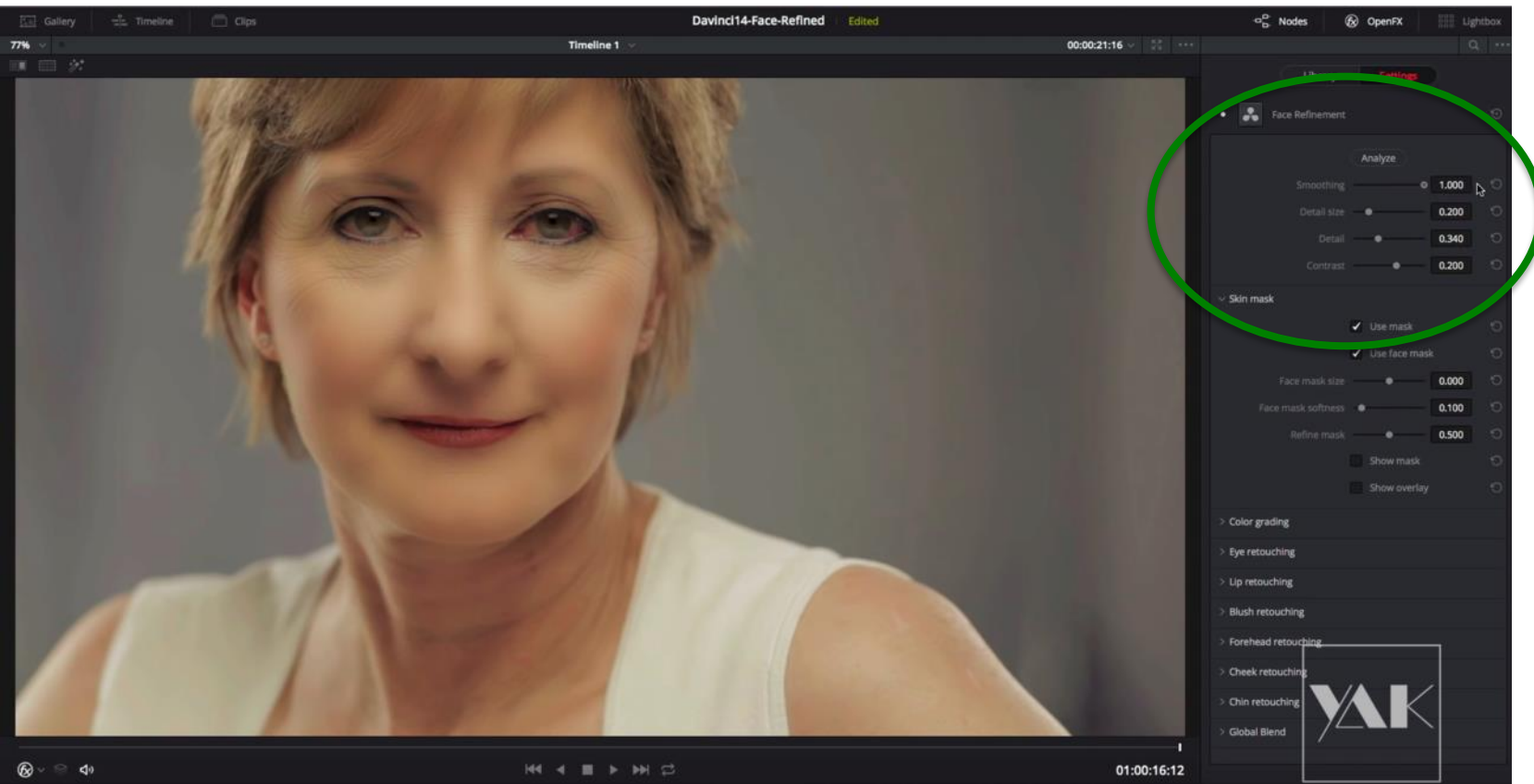
- Analyze**
 - Smoothing: 0.000
 - Detail size: 0.200
 - Detail: 0.340
 - Contrast: 0.200
- Skin mask**
 - Use mask
 - Use face mask
 - Face mask size: 0.000
 - Face mask softness: 0.100
 - Refine mask: 0.500
 - Show mask
 - Show overlay

Below the 'Face Refinement' settings, there are expandable sections for 'Color grading', 'Eye retouching', 'Lip retouching', 'Blush retouching', 'Forehead retouching', 'Cheek retouching', 'Chin retouching', and 'Global Blend'. A 'YAK' logo is visible in the bottom right corner of the interface.

9 - TEXTURE CONTROL - WHICH TOOLS?

IN POST

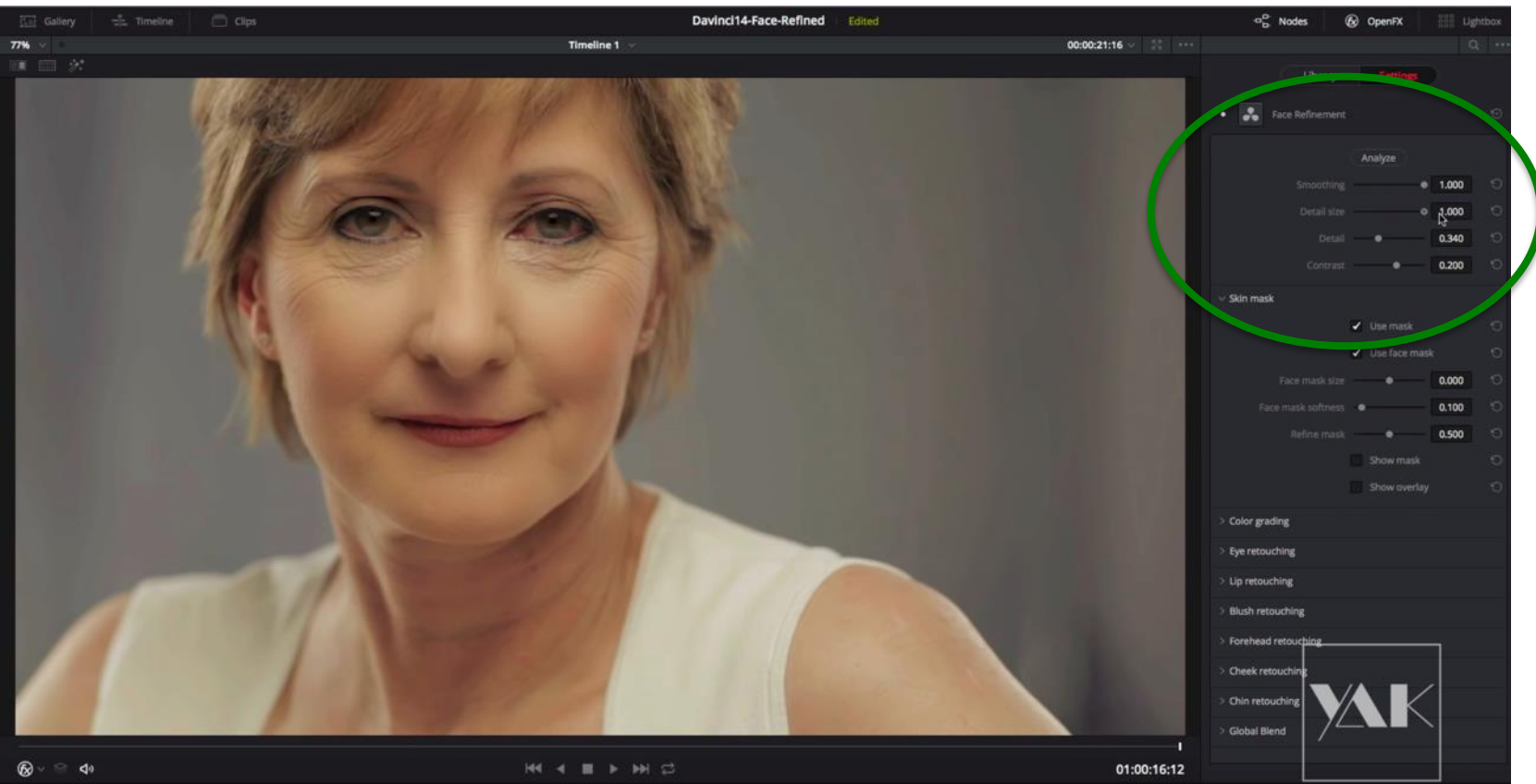
EXAMPLES: **DAVINCI** RESOLVE FX FACE REFINEMENT



9 - TEXTURE CONTROL - WHICH TOOLS?

IN POST

EXAMPLES: **DAVINCI** RESOLVE FX FACE REFINEMENT



9 - TEXTURE CONTROL - WHICH TOOLS?

IN POST

EXAMPLES: **DAVINCI** RESOLVE FX FACE REFINEMENT

The screenshot displays the DaVinci Resolve software interface, specifically the Face Refinement tool. The main preview window shows a close-up of a woman's face. The settings panel on the right is highlighted with a green circle and includes the following controls:

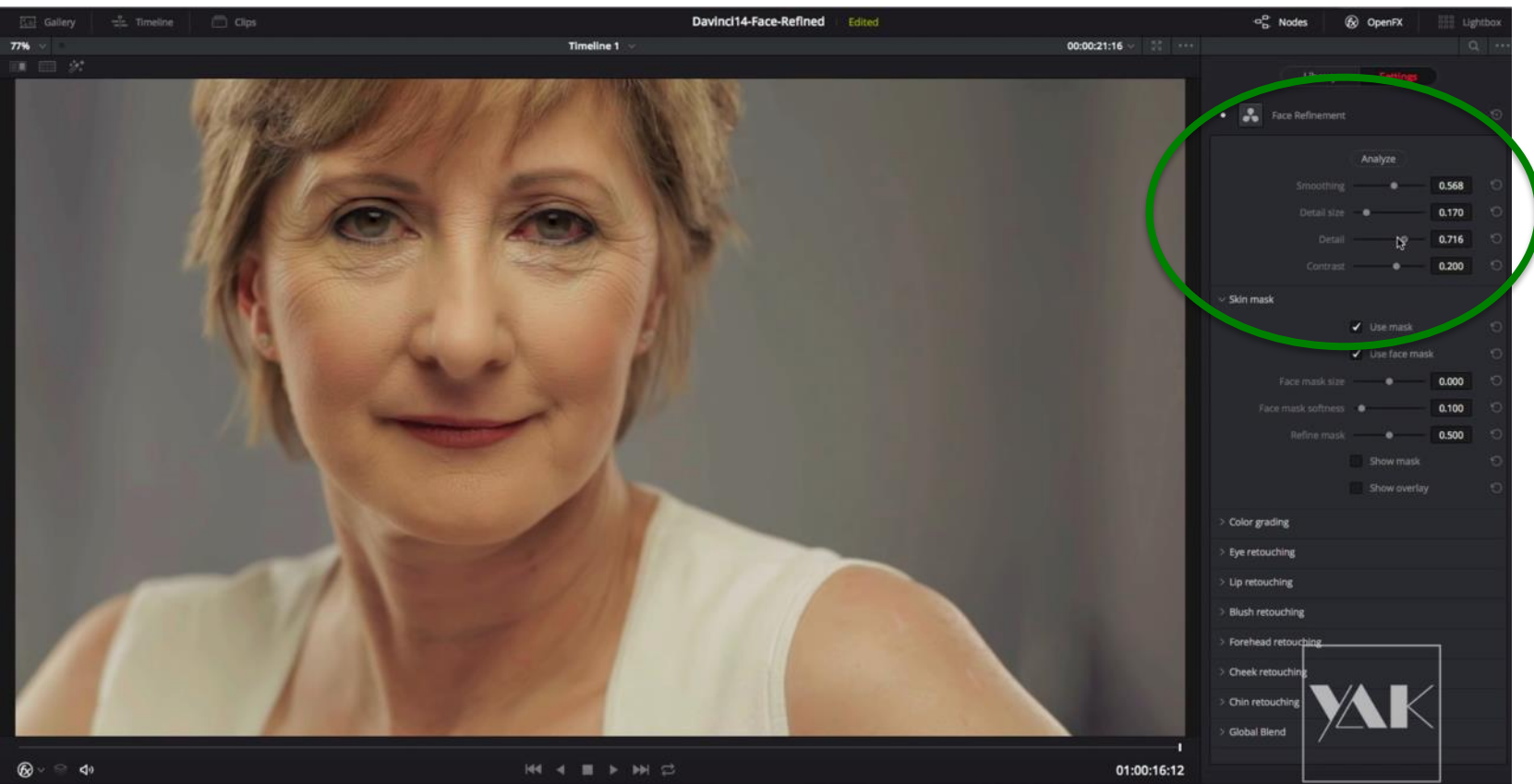
- Analyze**
 - Smoothing: 0.568
 - Detail size: 0.762
 - Detail: 0.340
 - Contrast: 0.200
- Skin mask**
 - Use mask
 - Use face mask
 - Face mask size: 0.000
 - Face mask softness: 0.100
 - Refine mask: 0.500
 - Show mask
 - Show overlay
- Color grading**
- Eye retouching**
- Lip retouching**
- Blush retouching**
- Forehead retouching**
- Cheek retouching**
- Chin retouching**
- Global Blend**

The 'YAK' logo is visible in the bottom right corner of the interface.

9 - TEXTURE CONTROL - WHICH TOOLS?

IN POST

EXAMPLES: **DAVINCI** RESOLVE FX FACE REFINEMENT



9 - TEXTURE CONTROL - WHICH TOOLS?

IN POST

EXAMPLES: **DAVINCI** RESOLVE FX FACE REFINEMENT

The screenshot displays the DaVinci Resolve software interface. The main window shows a video clip of a woman's face. On the right side, the 'Face Refinement' tool settings are visible, highlighted with a green circle. The settings include:

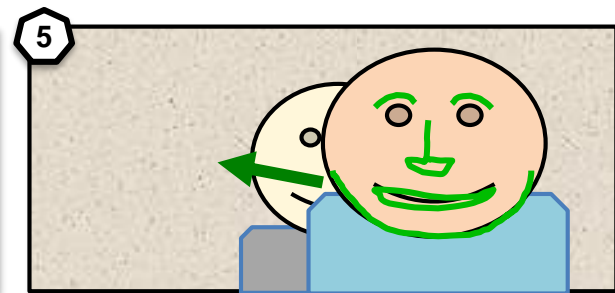
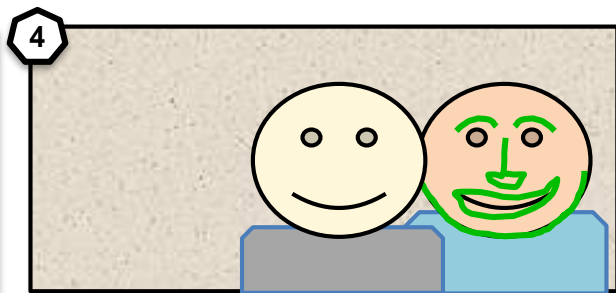
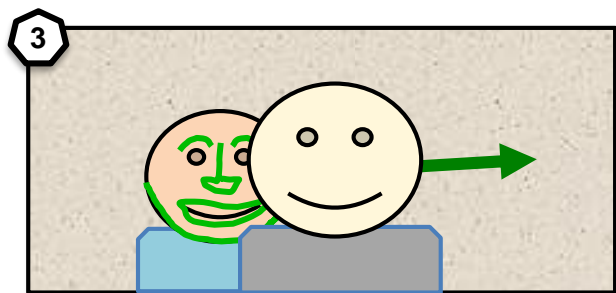
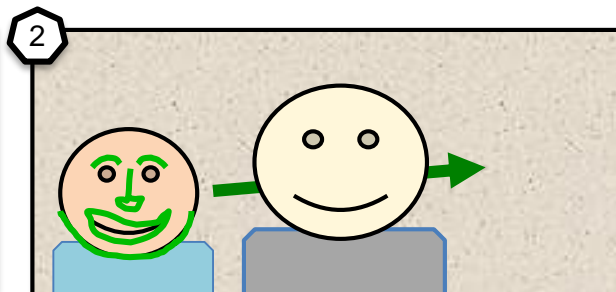
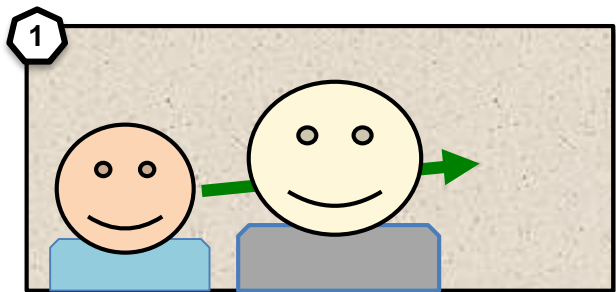
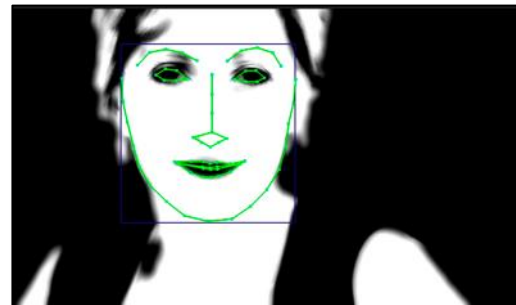
- Analyze section:
 - Smoothing: 0.568
 - Detail size: 0.170
 - Detail: 0.238
 - Contrast: -0.591
- Skin mask section:
 - Use mask
 - Use face mask
 - Face mask size: 0.000
 - Face mask softness: 0.100
 - Refine mask: 0.500
 - Show mask
 - Show overlay

Below the settings panel, there are expandable sections for Color grading, Eye retouching, Lip retouching, Blush retouching, Forehead retouching, Cheek retouching, Chin retouching, and Global Blend. A 'YAK' logo is visible in the bottom right corner of the interface.

9 - TEXTURE CONTROL - WHICH TOOLS?

IN POST

EXAMPLES: DAVINCI RESOLVE FX FACE REFINEMENT



The facial recognition works pretty well even when the subject passes behind another actor or an object.

THE SHARPNESS AND THE 4K WORKFLOW

10 - EXAMPLE OF CONFUSION

NETFLIX






















Requirements

10 - EXAMPLE OF CONFUSION

NETFLIX

Requirements

<https://partnerhelp.netflixstudios.com/hc/en-us/articles/360000579527-Cameras-and-Image-Capture>

NETFLIX PARTNER HELP CENTER			
GETTING STARTED SPECIFICATIONS & GUIDES TECHNOLOGY RESOURCES			
Approved Cameras			
The cameras listed below meet the minimum resolution and recording requirements listed above. This list is not exhaustive; additional approved cameras may be available.			
Camera		Effective Pixels	Recording Format
ARRI Alexa LF		4.5K: 4448x3096	- ARRIRAW - Profiles: 422 HQ (or higher)
ARRI Alexa 65		6K: 6560x3100	- ARRIRAW
Canon C300 Mk II		4K: 4096x2160	- Canon RAW - XF-AVC (4K)
Canon C50		4K: 4096x2160	- Canon RAW - XF-AVC (4K)
Canon C70		4K: 4096x2160 4.5K: 4512x2376	- Canon RAW - XF-AVC (4K) - ProRes HQ (4K)
Panasonic VariCam 35		4K: 4096x2160	- V-RAW - AVC-Intra4K
Panasonic VariCam LT		4K: 4096x2160	- V-RAW - AVC-Intra4K
Panasonic VariCam Pure		4K: 4096x2160	- V-RAW
RED Dragon		6K: 6144x3160	- REDCODE RAW (up to 6:1)
RED Helium		8K: 8192x4320	- REDCODE RAW (up to 8:1)
RED Monstro		8K: 8192x4320	- REDCODE RAW (up to 8:1)
Panasonic DRL		8K: 8192x4320	- REDCODE RAW (up to 6:1)
Sony Venice		6K: 6048x4032	- RAW (up to 4096x2160) - X-OCN - XAVC-I
Sony F55		4K: 4096x2160	- F55RAW - X-OCN - XAVC-I (4K)
Sony F65		4K: 4096x2160	- F65RAW - F65RAW-LITE - XAVC-I (4K)
Sony F57		4K: 4096x2160	- XAVC-I (4K)
Sony F5		4K: 4096x2160	- XAVC-I (4K)* *4K upgrade license required
Sony HDC-4300		4K: 4096x2160	- 4K Baseband Video
Sony PWH-2450		UHD: 3840x2160	- XAVC-I QFHD 300 mode
Blackmagic Design URSA Mini 4.6K		4.6K: 4608x2592	- CinemaDNG RAW (up to 4:1)
Blackmagic Design URSA Mini Pro 4.6K		4.6K: 4608x2592	- CinemaDNG RAW (up to 4:1)

10 - EXAMPLE OF CONFUSION

NETFLIX

Requirements

- Confusion between photosites and pixels
- Cameras like RED Weapon or Sony F65 are at the same level of a C300 MKII or an URSA
- Alexa (Open gate) is not mentioned
- Lenses aren't mentioned

THE SHARPNESS AND THE 4K WORKFLOW

11 - CONCLUSIONS

11 - CONCLUSIONS

REMINDER: PARAMETERS - DETAILING SYSTEM - LENSES

- All these parameters, previously described - quite complex - gave cinematographers a control of the texture of the image.
- Many filmmakers and cinematographers are fighting against a feeling of over sharpness when they use a 4K workflow
- The combination of camera and lenses is a key parameter to control the texture
- The combination of “sharp” cameras and soft lenses or vintage ones often gives interesting results but without a controllable approach.

11 - CONCLUSIONS

REMINDER: PARAMETERS - DETAILING SYSTEM - LENSES

- Due to the OLPF (among other parameters), there is an important need to increase the sharpening/detailing setting, internally for a codec or in post for raw materials. This is the role of the detailing system”
- Do we know what level of detail is used in a camera or in post?
- Who is deciding about this level?
- Engineers, colorists or/and cinematographers?
- Do we need similar controls available in the former HD cameras?

11 - CONCLUSIONS

REMINDER: PARAMETERS - DETAILING SYSTEM - LENSES

- Or could new algorithms create other ways to deal with the static pattern of the digital image (Similar to Arri detailing parameters or Filmlight texture equaliser)?
- Some manufacturers have opened these controls in their cameras, like Arri in the Alexa Mini & the Amira. Arri gives its factory level of sharpness and a way to compare the different values to increase or reduce the detailing parameters. See slides 163 to 168: ARRI TEXTURE TOOLS
- The choice of the lighting fixtures is important in the general process of texture

11 - CONCLUSIONS

REMINDER: PARAMETERS - DETAILING SYSTEM - POST

- When shooting in RAW the detailing control is not always available in post after the deBayer process
- It can lead to expensive and time consuming texture control during the grading session

CONCLUSIONS 1/2

- The role of sharpness through the detailing system is a key point in the control of the texture
- Choosing a lens without access of detailing control on the camera or in post is leading to some important limitations or confusions
- If cinematographers don't have these parameters reachable, they often have to fight against the machine.

CONCLUSIONS 2/2

- Cinematographers/colorists always find strategies to deal with oversharppness, but at what price?
- Theorically, we have all the means to improve the creative aspects of the cinematographers craft
- We just need to have, from manufacturers, some more open doors, including the detailing parameters

THE SHARPNESS AND THE 4K WORKFLOW

12 - ARRI TEXTURE TOOLS

EXAMPLE: ARRI

ANOTHER IMPORTANT STEP GIVEN BY ARRI

- A real access to control of sharpness on ProRes (Alexa Mini, Amira)
- Comparison tests allowing to judge the quality of a camera regarding sharpness

EXAMPLE: ARRI

An important meeting at Arri in 2015

Following slides

WORKSHOP AT ARRI MUNICH:

HOW TO CONTROL THE TEXTURE OF THE DIGITAL IMAGE

Special Thanks to Harald Brendel (Arri - Principal Engineer Image Science), and his team of engineers

EXAMPLE: ARRI

An important meeting at Arri in 2015

Following slides

WORKSHOP AT ARRI MUNICH:

Imago website:

<https://www.imago.org/index.php/technical/item/410-workshop-at-arri-munich-how-to-control-the-texture-of-the-digital-image.html>

12 - ARRI TEXTURE TOOLS

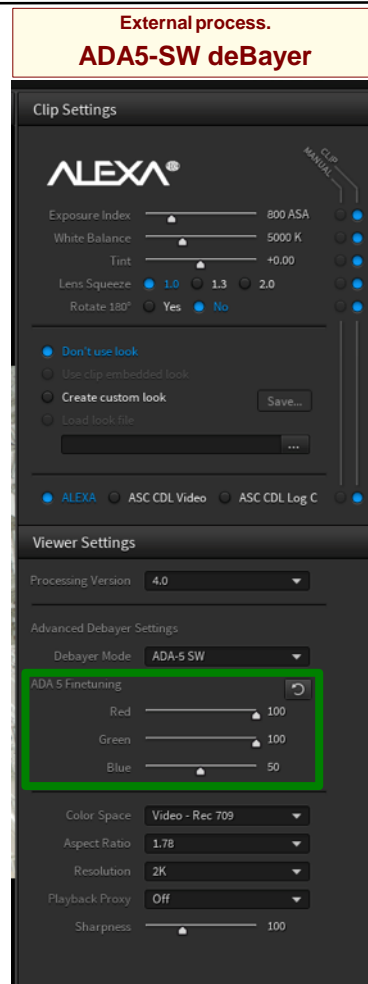
EXAMPLE: ARRI

IN POST

CONTROL OF SHARPNESS

In post for 4K Raw

by channel R, G, B



12 - ARRI TEXTURE TOOLS: SHARPNESS

ALEXA MINI & AMIRA

EXAMPLE: ARRI

IN CAMERA

Only when setting the Recording/Sensor format to: **S16, 3.2K, 4K UHD or 4:3 2.8K**, not 1080p or 2K.

CONTROL OF SHARPNESS

2 parameters: image sharpness & image detail

ALEXA MINI



AMIRA



AMIRA



Sharpness controls the amplification of micro contrast in the image, **Detail** controls the smallest detail that is reproduced by the filter.

ARRI SCALER PARAMETER FEMALE FACE

With the minimum of Detail

The noise is due to the zoom in the image, but we can see the difference on the structure of the sharpness.

———— Sharpness —————>

The photos below come from zoom in screen captures

1



F000 - S000

2



F000 - S100

3



F000 - S200

ARRI SCALER PARAMETER FEMALE FACE

Medium settings of Detail

The picture number 5 is the default in the camera,

this is the level we are accustomed to find on an Alexa camera. Settings in the ARC (ARRIRAW Converter) are F=100 S=100

Sharpness →

4

5

6



F100 - S000



F100 - S100



F100 - S200

ARRI SCALER PARAMETER FEMALE FACE

With the maximum of Detail

Sharpness →

7



F200 - S000

8



F200 - S100

9



F200 - S200

From the minimum of Sharpness and Detail to the maximum



The picture number 5 is the default in the camera,



F000 - S000



F100 - S100



F200 - S200

12 - ARRI TEXTURE TOOLS: NOISE REDUCTION

EXAMPLE: ARRI

IN CAMERA

ALEXA LF, ALEXA SXT,
ALEXA MINI & AMIRA

CONTROL OF NOISE REDUCTION

In camera for ProRes - The noise reduction parameter plays also a role

ALEXA LF



OFF/ON

ALEXA SXT



OFF/ON

ALEXA MINI

AMIRA



OFF/ON/STRONG

12 - ARRI TEXTURE TOOLS: NOISE REDUCTION

FOR ALEXA MINI & AMIRA

The photos below come from zoom in screen captures

Noise reduction: OFF



Noise reduction: ON



Noise reduction: STRONG



12 - ARRI TEXTURE TOOLS: NOISE REDUCTION

ARRI TEXTURE TOOLS

On the Alexa SXT and LF for ProRes recording you get Noise reduction on/off, and no sharpness/details controls.



DIGITAL PRODUCTION
CHALLENGE II

THE SHARPNESS AND THE 4K WORKFLOW

13 - EXAMPLE: FILM 'CARTAS DA GUERRA'

FOCAL

resource

13 - EXAMPLE: FILM 'CARTAS DA GUERRA'

Focal website - Imago Website

Technical and artistic references from Focal about DPC II seminar

<https://www.imago.org/index.php/technical/item/608-focal-digital-production-seminar-in-lisbon.html>

Courtesy of Pierre Aghte director of the Focal Foundation

13 - EXAMPLE: FILM 'CARTAS DA GUERRA'

Imago Website with the courtesy of FOCAL

Example: Cinematographers Strategies to deal with oversharpness

FILM

“CARTAS DA GUERRA”

13 - EXAMPLE: FILM 'CARTAS DA GUERRA'

Film

“CARTAS DA GUERRA”

Director: Ivo M. Ferreira

Producer/Editor/Workflow designer: Sandro Aguilar

Cinematographer: João Ribeiro (AIP)

Colorist/Post-production adviser: Paulo Americo da Silva











Camera: SONY ALPHA 7S customized by **João Ribeiro** - Cinematographer & **Ricardo Simões** - First AC



Advantage:

- Weight
- Sensitivity



João Ribeiro:

"Camera: Sony A7s, (imposed by the production) it was the first time I film with a "photo camera".

I was really scare, so what I pass to my crew was:

"we have to do a film where nobody can say we use this type camera"

"The fact that is not heavy, you have to be very educated with that, and tend not to put it everywhere, but just in the correct place for each shot"



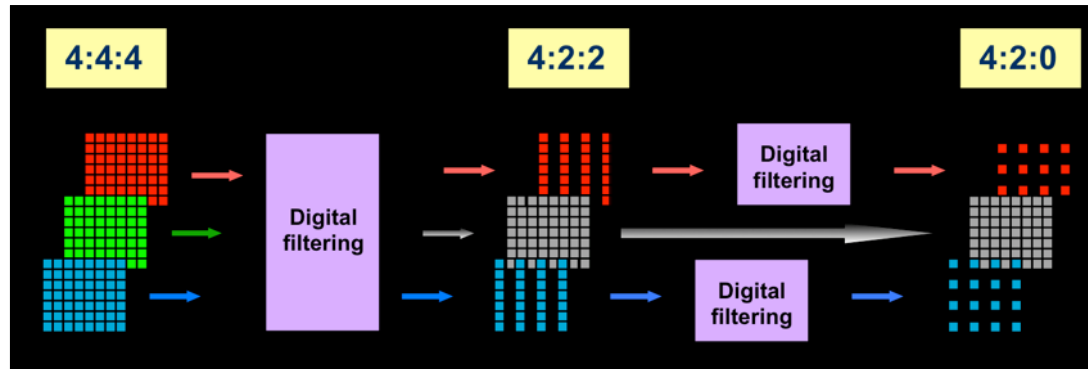
Post-production customized by Producer/Editor/Workflow designer: **Sandro Aguilari**

& Colorist/Post-production adviser: **Paulo Americo da Silva**

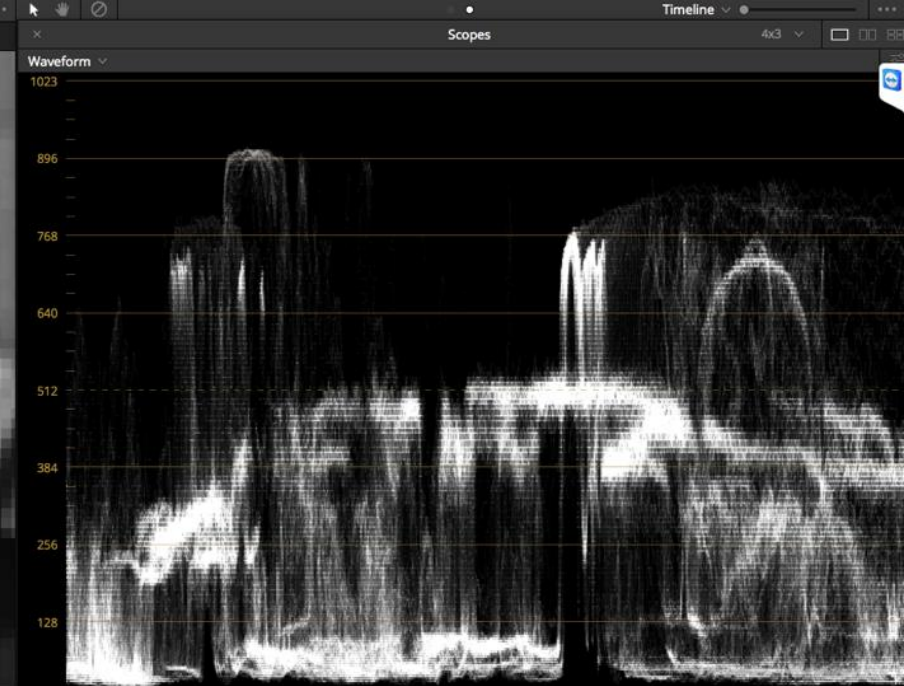
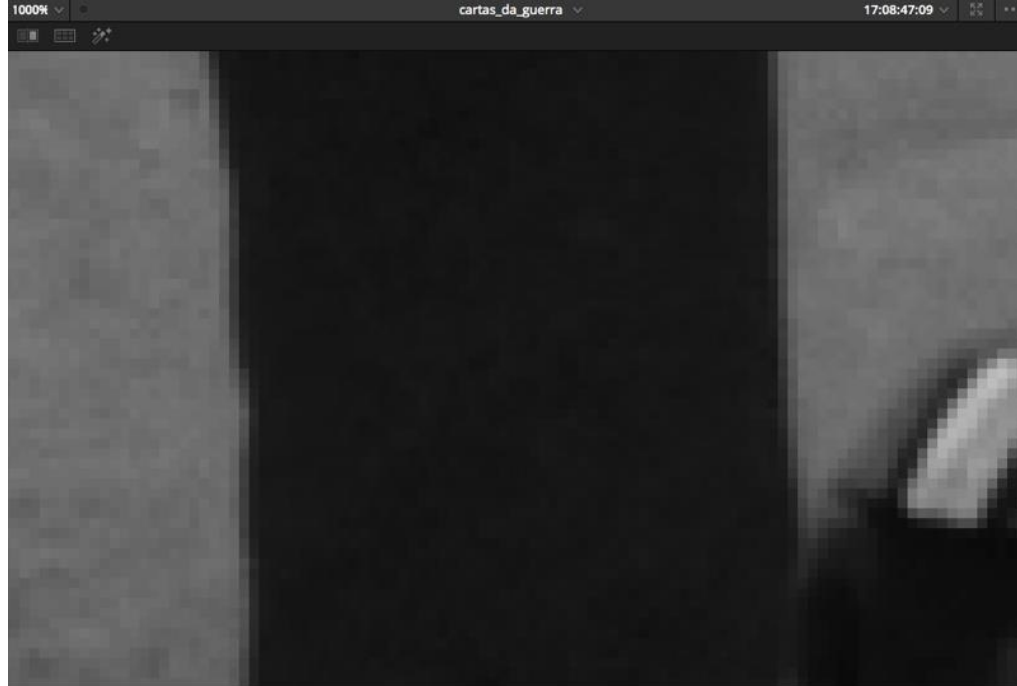
Disadvantage:

- The 8-bit 4:2:0 h264 recording format is certainly not the best format to deal with the highest aesthetic demands

However **Paulo Americo** used the lack of color information as an asset for this black and white film.







Color Wheels

Log

Shadow Midtone Highlight Offset

0.00 0.00 0.00 25.00 25.00 25.00

R G B R G B R G B R G B

Cont 1.000 Pivot 0.500 LR 0.333 HR 0.667 Sat 50.00 Hue 50.00

Curves

Zoom into the image in black and white without film grain

Custom

Edit

100 100 100 100

Soft Clip

Low 50.0 High 50.0

L.S. 0.0 H.S. 0.0

Info

Clip

File Name C0002 (fcp45 ...)

Reel Name BOB#048

Start T/C 17:08:13:04

End T/C 17:09:35:06

Duration 00:01:22:02

Frames 2052

Version Version 1

Frame Rate 25.000 fps

Source Res 1920x1080 8bit

Codec H.264

System

Clips 641

Proxy Off

Clip Cache Off

Ref Transform Off

Ref Mode Gallery

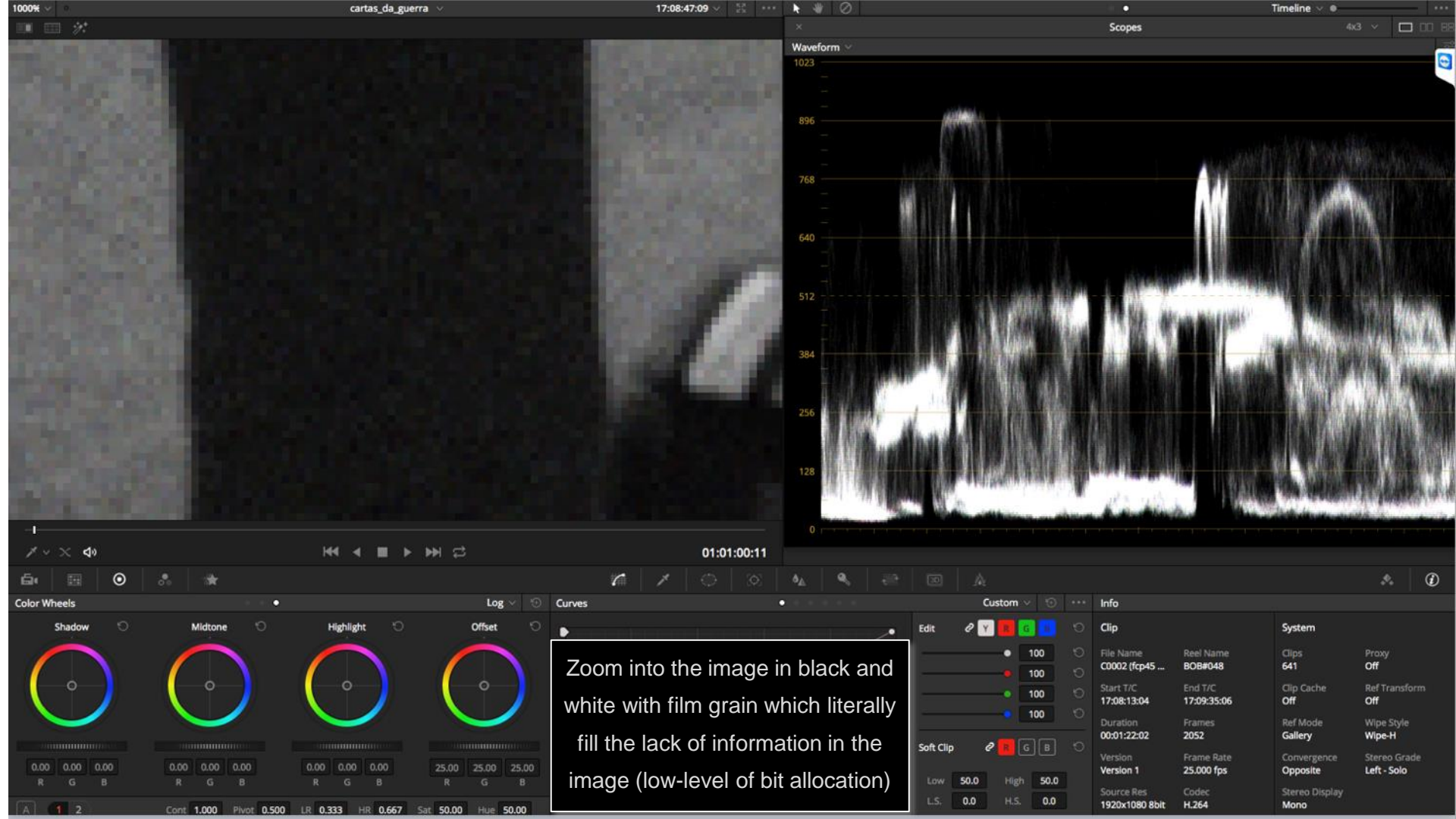
Wipe Style Wipe-H

Convergence Opposite

Stereo Grade Left - Solo

Stereo Display Mono





Zoom into the image in black and white with film grain which literally fill the lack of information in the image (low-level of bit allocation)

Color Wheels Log

Shadow Midtone Highlight Offset

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 25.00 25.00 25.00

R G B R G B R G B R G B

Cont: 1.000 Pivot: 0.500 LR: 0.333 HR: 0.667 Sat: 50.00 Hue: 50.00

Custom

Edit Y R G B

100 100 100 100

Soft Clip R G B

Low 50.0 High 50.0 L.S. 0.0 H.S. 0.0

Info

Clip		System	
File Name	C0002 (fcp45 ...)	Clips	641
Reel Name	BOB#048	Proxy	Off
Start T/C	17:08:13:04	Clip Cache	Off
End T/C	17:09:35:06	Ref Transform	Off
Duration	00:01:22:02	Ref Mode	Gallery
Frames	2052	Wipe Style	Wipe-H
Frame Rate	25.000 fps	Convergence	Opposite
Version	Version 1	Stereo Grade	Left - Solo
Source Res	1920x1080 8bit	Stereo Display	Mono
Codec	H.264		



Without film grain



With film grain



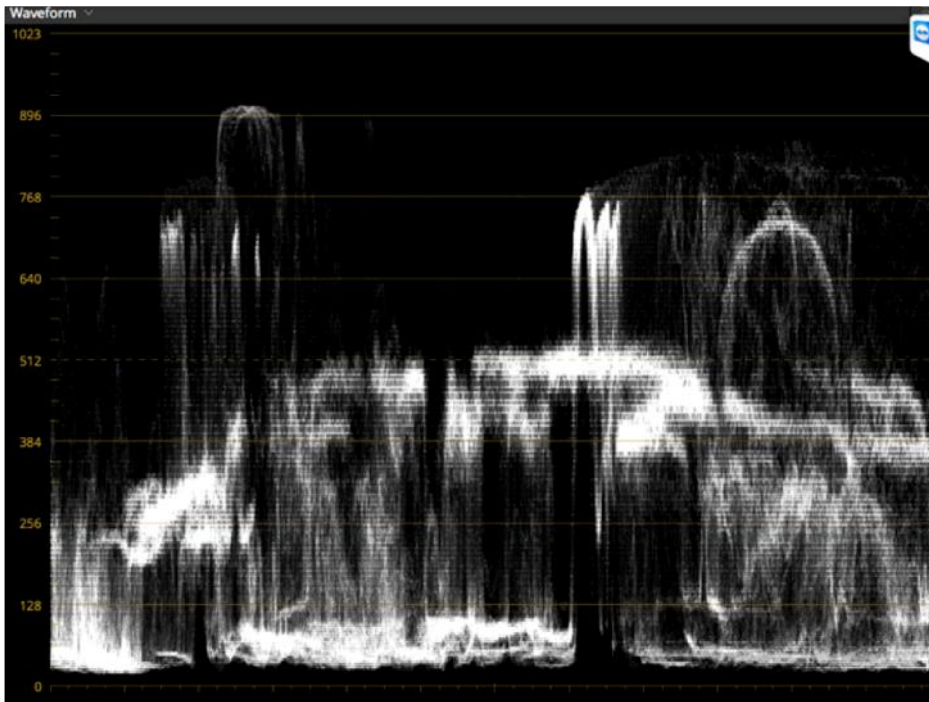
Without film grain

Zoom

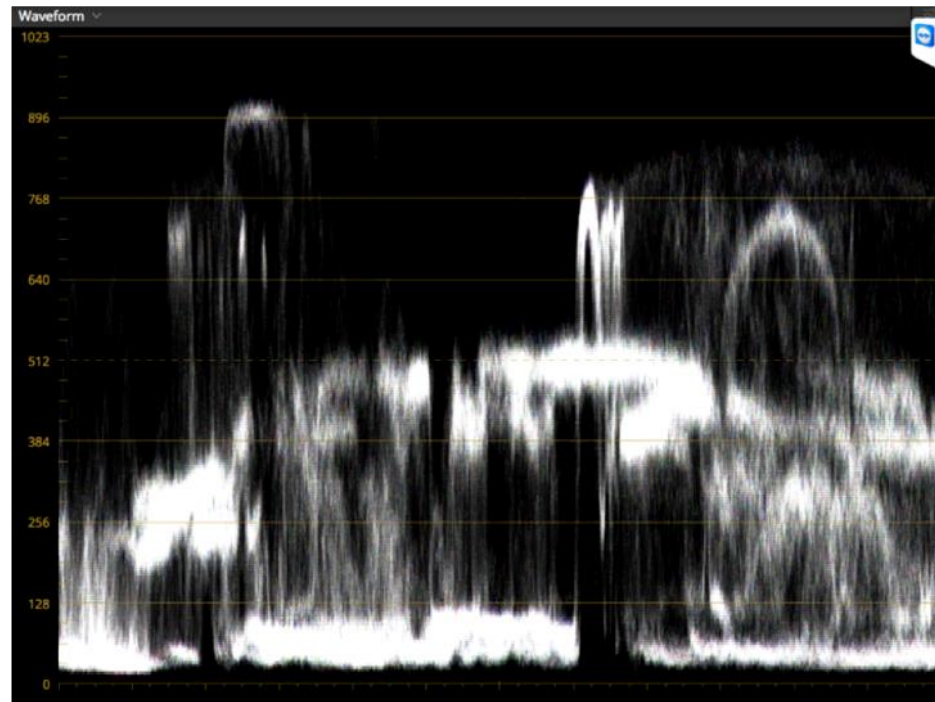


With film grainC

Zoom



Without film grain



With film grain

Special thanks to:

Lars Beyer - Cinematographer DFF

Louis Philippe Capelle - Cinematographer SBC

Rolf Coulanges - Cinematographer BVK

Joe Dunton - Cinematographer MBE, BSC

Anders Holck - Cinematographer DFF

Ron Johanson - Cinematographer OAM ACS

Kommer Kleijn - Cinematographer SBC

Alex Linden - Cinematographer FSF

Jannicke Mikkelsen - FNF Vr Film Director/ Cinematographer MA

João Ribeiro - Cinematographer AIP

John Christian Rosenlund - Cinematographer FNF

Mick van Rossum - Cinematographer NSC

Roberto Schaefer - Cinematographer ASC AIC

Dave Stump - Cinematographer ASC

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