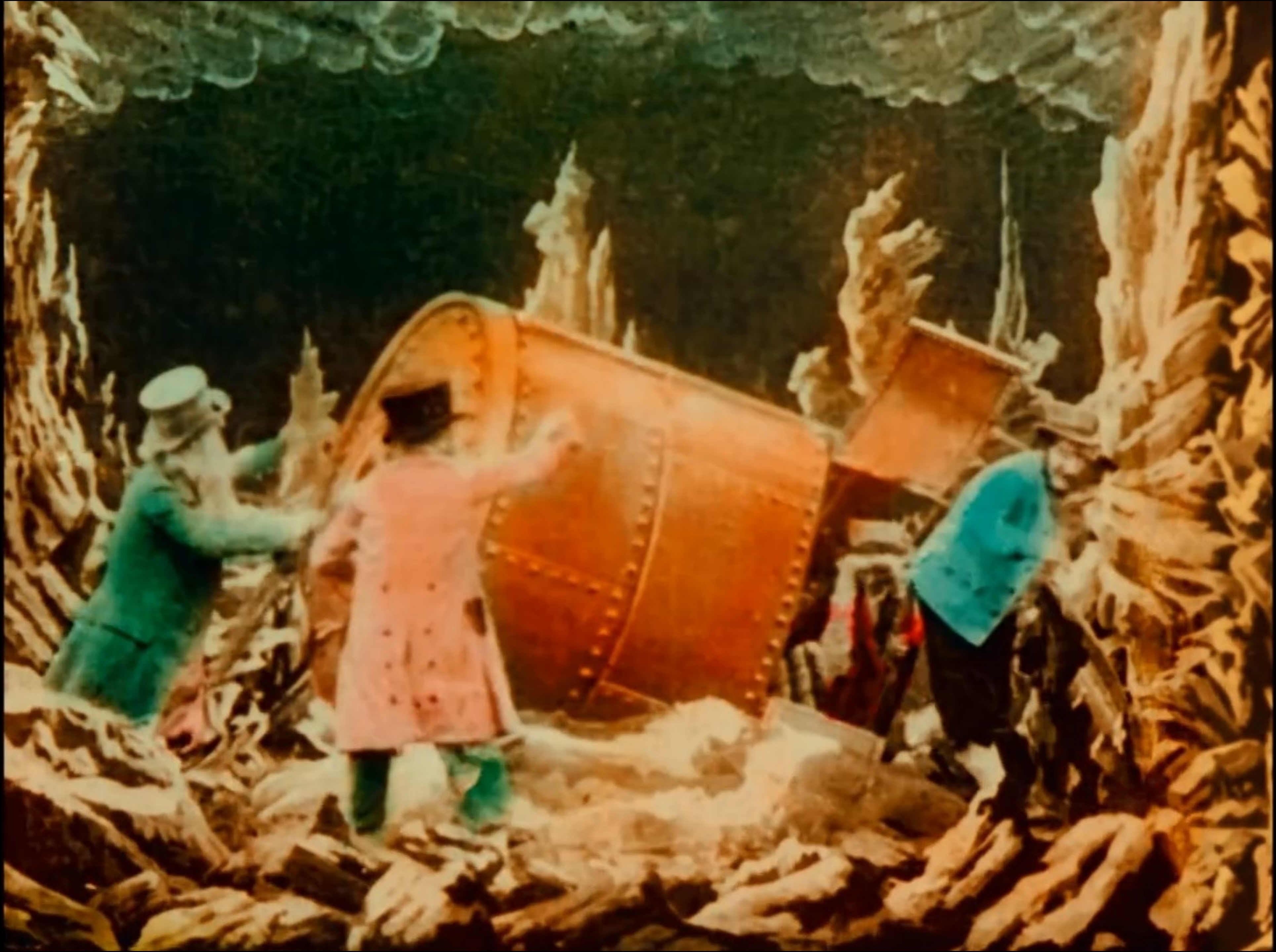
Art & Science of colorization

Martin Matulík



A Trip to the Moon

History of Color

Annabelle Serpentine dance (1895)

First hand-tinted film

The Cat and the Fiddle(1934)

3-strip Technicolor

History of Color

B & W (30's & 40')

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Kodak EastManColor (1952)

Cheap 1-strip „monopack"

History of Color

Digital Revolution (1999)
Film & Digital

Digital color grading (2000)
Digital intermediate

History of Color

DIGITAL CINEMATOGRAPHY

Why adjusting Color?

1) Portraying reality authentically

Color Correction

2) Enhancing Storytelling

Color Grading

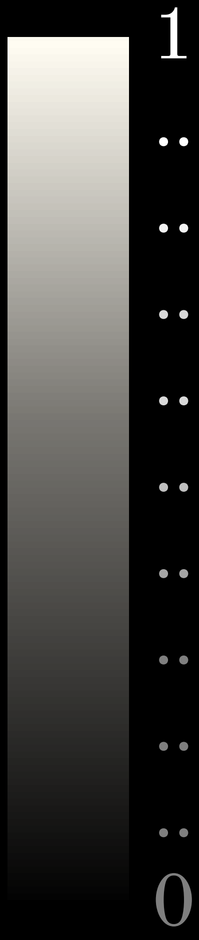
Color image

LUMA

CHROMA

Color image

LUMA



0.75	0.55	0.75
0.75	0.83	0.32
0.75	0.87	0.60
0.75	0.79	0.57
0.75	0.54	0.97
0.75	0.80	0.42
0.75	0.69	0.37

Color image

CHROMA

1
..
0
1
..
0
1
..
0

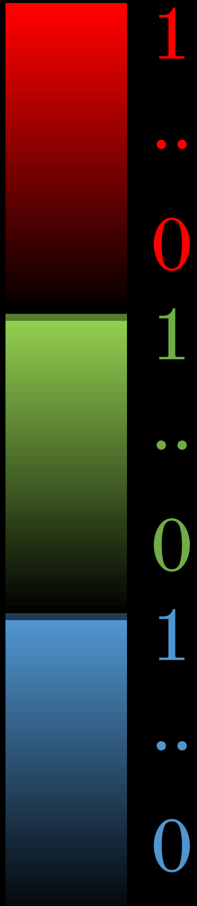
0.35	0.10
0.25	0.20

0.25	0.08
0.30	0.15

0.15	0.12
0.25	0.07

Color image

CHROMA



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Why adjusting Color?

1) Portraying reality authentically

Color Correction

Color Correction

a) Setting Blacks & Whites (Luma)

Color Correction

a) Setting Blacks & Whites (Luma)

Color Correction

a) Setting Blacks & Whites (Luma)


Color Correction

b) Removing color casts (Chroma)

Color Correction

b) Removing color casts (Chroma)

Color Correction

b) Removing color casts (Chroma)

Color Correction

c) Correcting & enhancing colors (Luma + Chroma)

Color Correction

c) Correcting & enhancing colors (Luma + Chroma)

Color Correction

c) Correcting & enhancing colors (Luma + Chroma)

Color Correction

c) Correcting & enhancing colors (Luma + Chroma)

Color Correction

c) Correcting & enhancing colors (Luma + Chroma)

Color Correction

c) Correcting & enhancing colors (Luma + Chroma)

Color Correction

1) Portraying reality authentically

Color Correction

1.0
Individual Shot

1.5
Shot to Shot

Color Correction

1.5) Shot to Shot

Matching adjacent shots

1. Choosing master shot

Color Correction

1.5) Shot to Shot

Matching adjacent shots

2. Correcting master shot

Color Correction

1.5) Shot to Shot

Matching adjacent shots

3. Comparing to adjacent shots

Color Correction

1.5) Shot to Shot

Matching adjacent shots

4a. Adjusting primaries

Color Correction

1.5) Shot to Shot

Matching adjacent shots

4b. Adjusting secondaries

Why adjusting Color?

2) Enhancing Storytelling

Color Grading

Color Grading

2) Enhancing Storytelling

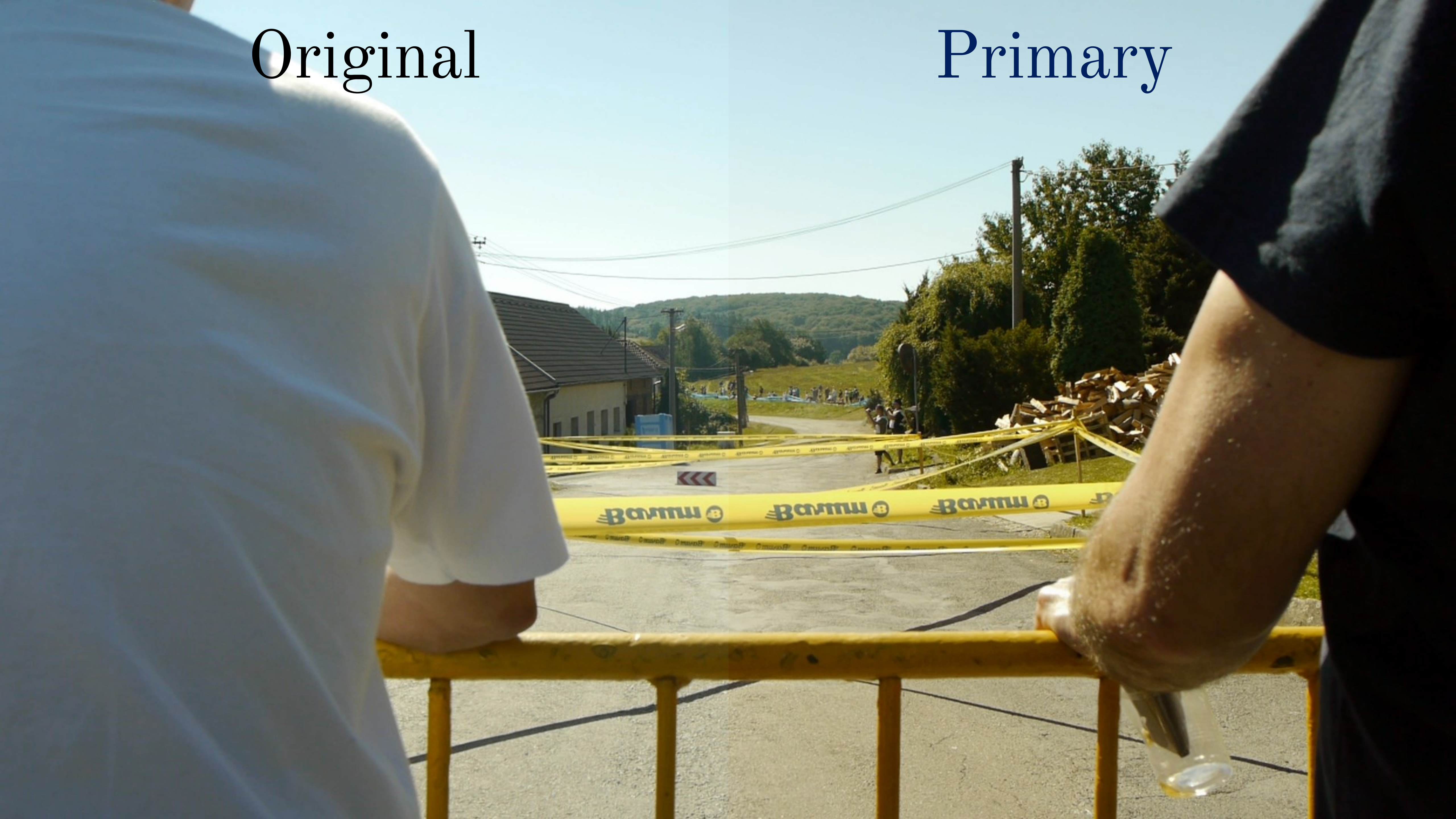
Color Grading

2) Enhancing Storytelling

Color Grading

2) Enhancing Storytelling

Case study


Original
Primary

1. Secondary corrections

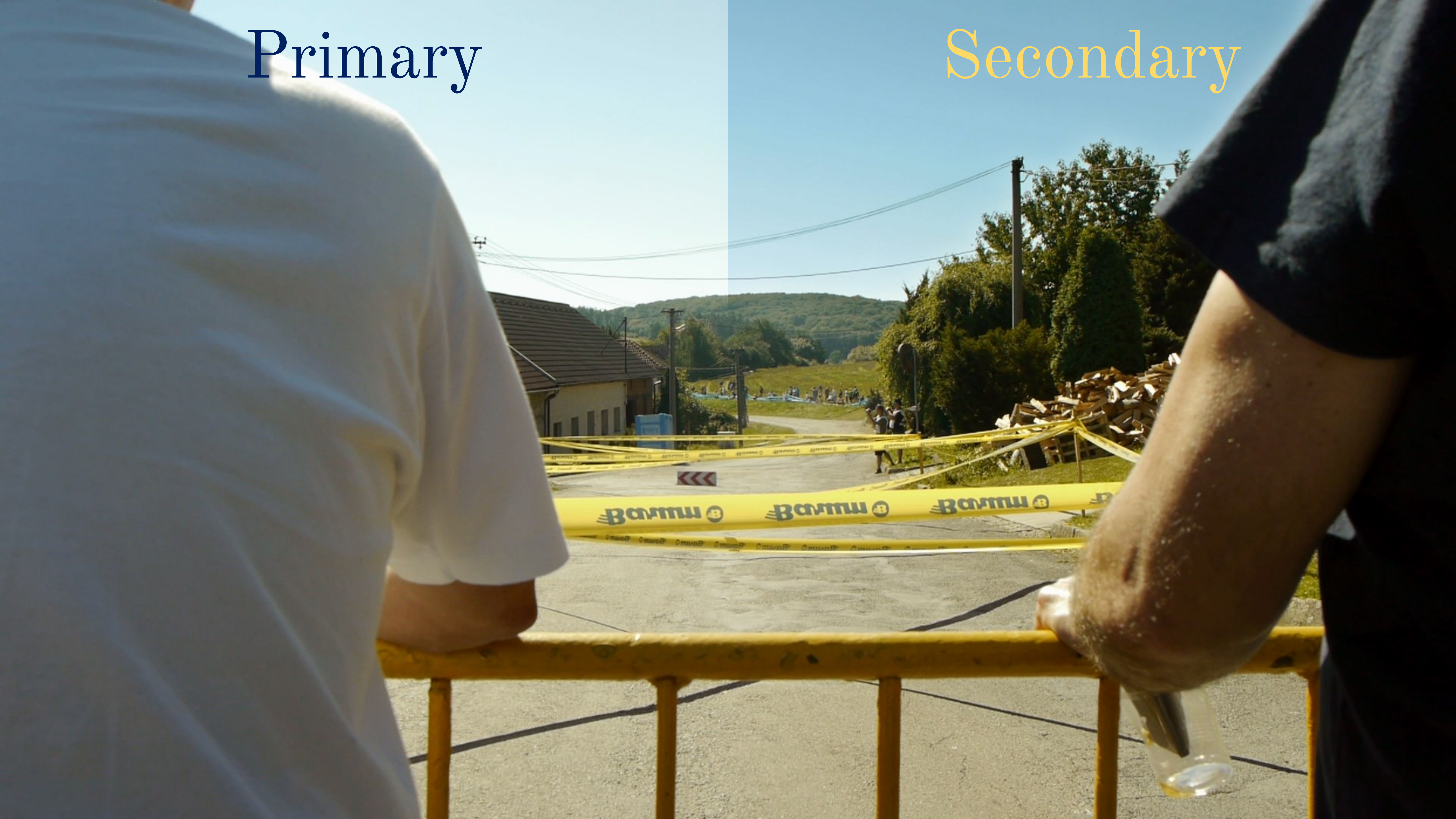
Default tonal range

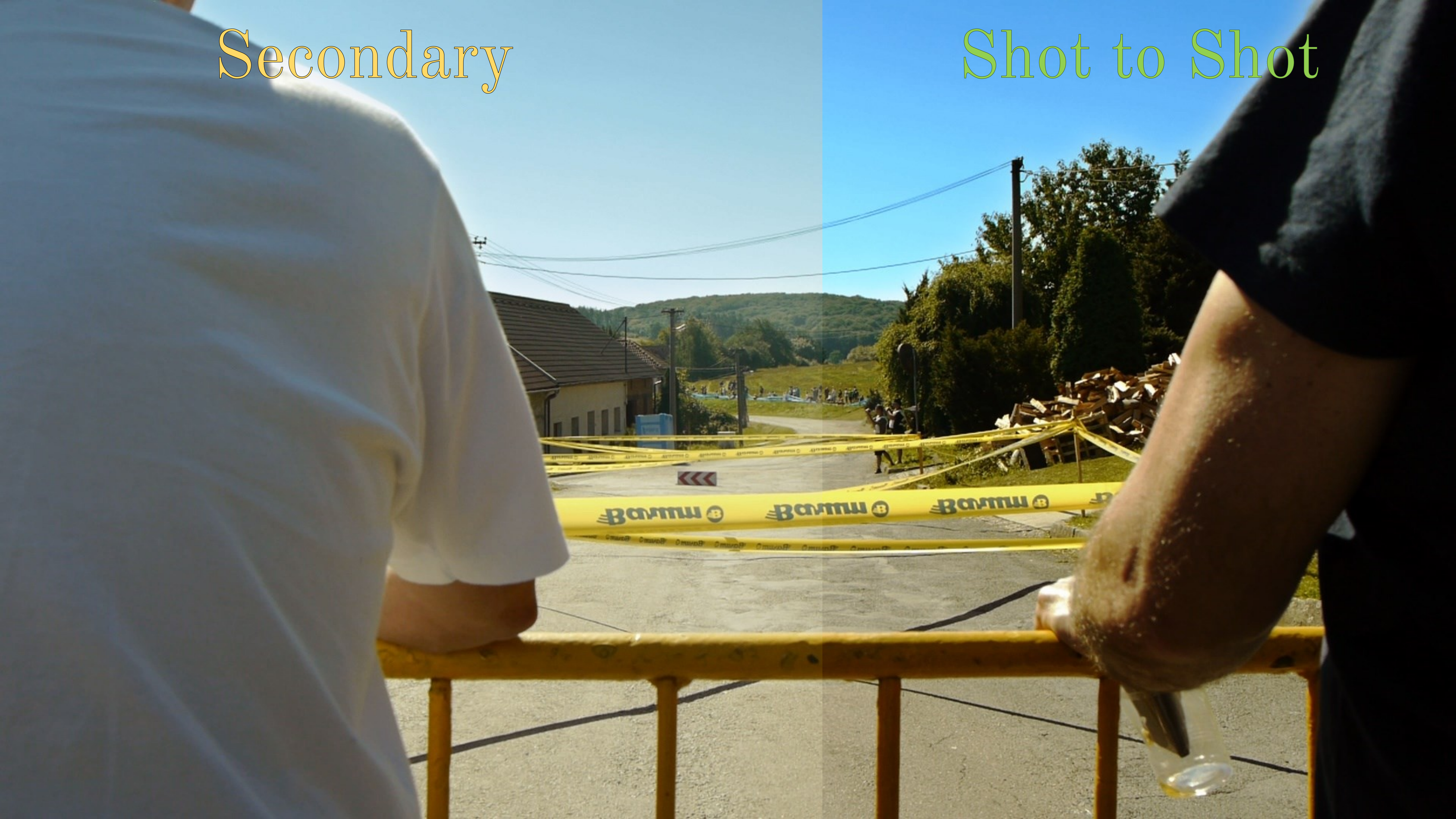
Adjusted tonal range

1. Secondary corrections

Sky segmented

Mask softened


Primary
Secondary


Secondary
Shot to Shot

1.5 Shot to Shot

Previous shot

Current shot

1.5 Shot to Shot

Previous shot

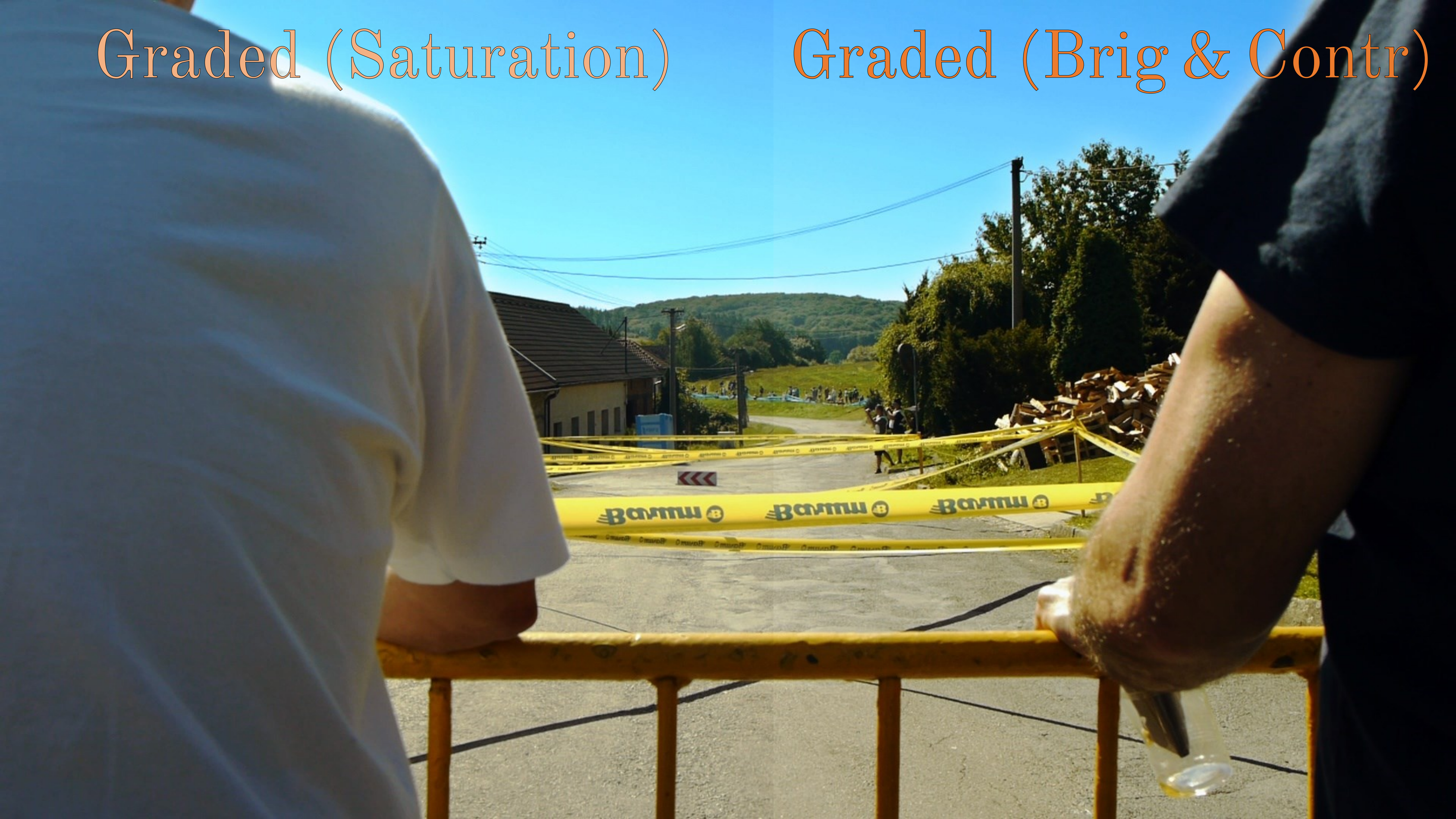
Current shot

1.5 Shot to Shot

Current shot

Next shot


Corrected
Graded (Saturation)


Graded (Saturation)
Graded (Brig & Contr)


Graded (Brig & Contr)
Graded (RGB)


Corrected
Graded (RGB)

Color treatment workflow

Color treatment workflow

1) Color Correction	-	Setting Blacks & Whites	(Luma)
	-	Removing color casts	(Chroma)
	-	Correcting & enhancing col.	$(Y + C)$

Color treatment workflow

1) Color Correction	-	Setting Blacks & Whites	(Luma)
	-	Removing color casts	(Chroma)
	-	Correcting & enhancing col.	(Y + C)
		* Globally	(Saturation)
		* Locally	(Segments)

Color treatment workflow

1) Color Correction	-	Setting Blacks & Whites	(Luma)
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Color treatment workflow

1) Color Correction	- Setting Blacks & Whites	(Luma)
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	- Correcting & enhancing col.	(Y + C)
	* Globally	(Saturation)
	* Locally	(Segments)
1.5) Shot to Shot	- Matching adjacent shots	(primaries)
	- Matching adjacent shots	(secondaries)
2) Color Grading	- Enhancing Color	(Saturation)
	- Enhancing Brightness & Contrast	
	- Enhancing Color	(RGB)

Color treatment workflow

1) Color Correction	-	Setting Blacks & Whites	(Luma)
	-	Removing color casts	(Chroma)
	-	Correcting & enhancing col.	(Y + C)
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1.5) Shot to Shot	-	Matching adjacent shots	(primaries)
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2) Color Grading	-	Enhancing Color	(Saturation)
	-	Enhancing Brightness & Contrast	
	-	Enhancing Color	(RGB)

Grading study

Grading study

☹☺ Setting mood

Grading study

☹☺ Setting mood

» Modulating overall pace

Grading study

☹☺ Setting mood

» Modulating overall pace

Estabilishing character’s POV

Grading study

Brightness Contrast Saturation

Color FX

Mood

Grading study

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Awaken & Anticipating

Grading study

blue

cooling down

Calmness

Grading study

complementary colors

Driver's discordance


RADEGAST
RADEGAST
RADEGAST
RADEGAST
RADEGAST
RADEGAST
RADEGAST
RADEGAST
SUPERIOR
SUPERIOR


SUPERIOR
RADEGAST
RADEGAST
RADEGAST
RADEGAST
RADEGAST
RADEGAST
RADEGAST

Grading study

- - -

blue yellow split toning

Joy & Ease

Grading study

-

-

-

blue yellow

split toning

☹☺

Madness & Inhibition

American civil war


ŠKODA Motorsport


158
ŠKODA Motorsport

Grading study

- ↑ ↑

Turmeric Warming

Enjoying the action!

Grading study

Red tint

Counterpoint

Argument

Viral emotions

Grading study



Grading study

Warm treatment

Color discordance

Micro-story

Grading study

↑ ↓ -

cyan Dulling

Relaxing

Grading study

↑ ↓ -

cyan Dulling

Frivolity

Grading study

-

↑↑↑

↑↑↑

Red & Black

Punch!

Aggression!


12


12

Grading study

Brown

Sepia

Bleach bypass

Redneck vision

Grading study

↑ ↑ ⇊

Brown Sepia

Bleach bypass

☹☺

Shit happens


Barum


Barum

Grading study

Blue

Cooling up

Clear mind

Easy driving

Conclusion

Conclusion

- Color is HU(G)E

Conclusion

	Color	is	**HU(G)E**
	Theory	<=	DIP, Psychology, Aesthetics, Storytelling

Conclusion

Color	is	**HU(G)E**
Theory	<=	DIP, Psychology, Aesthetics, Storytelling
Tools	–	work & comfort

Conclusion

Color	is	HU(G)E
Theory	$<=$	DIP, Psychology, Aesthetics, Storytelling
Tools	–	work & comfort
Workflow	$=$	safe road

Conclusion

Color	is	HU(G)E
Theory	<=	DIP, Psychology, Aesthetics, Storytelling
Tools	–	work & comfort
Workflow	=	safe road
Grading	=>	Fulfilling desired artistic intentions

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Thank you!