Low Cost Facial Scanning Using Photogrammetry in 'State of Decay 2'

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GAME DEVELOPERS CONFERENCE
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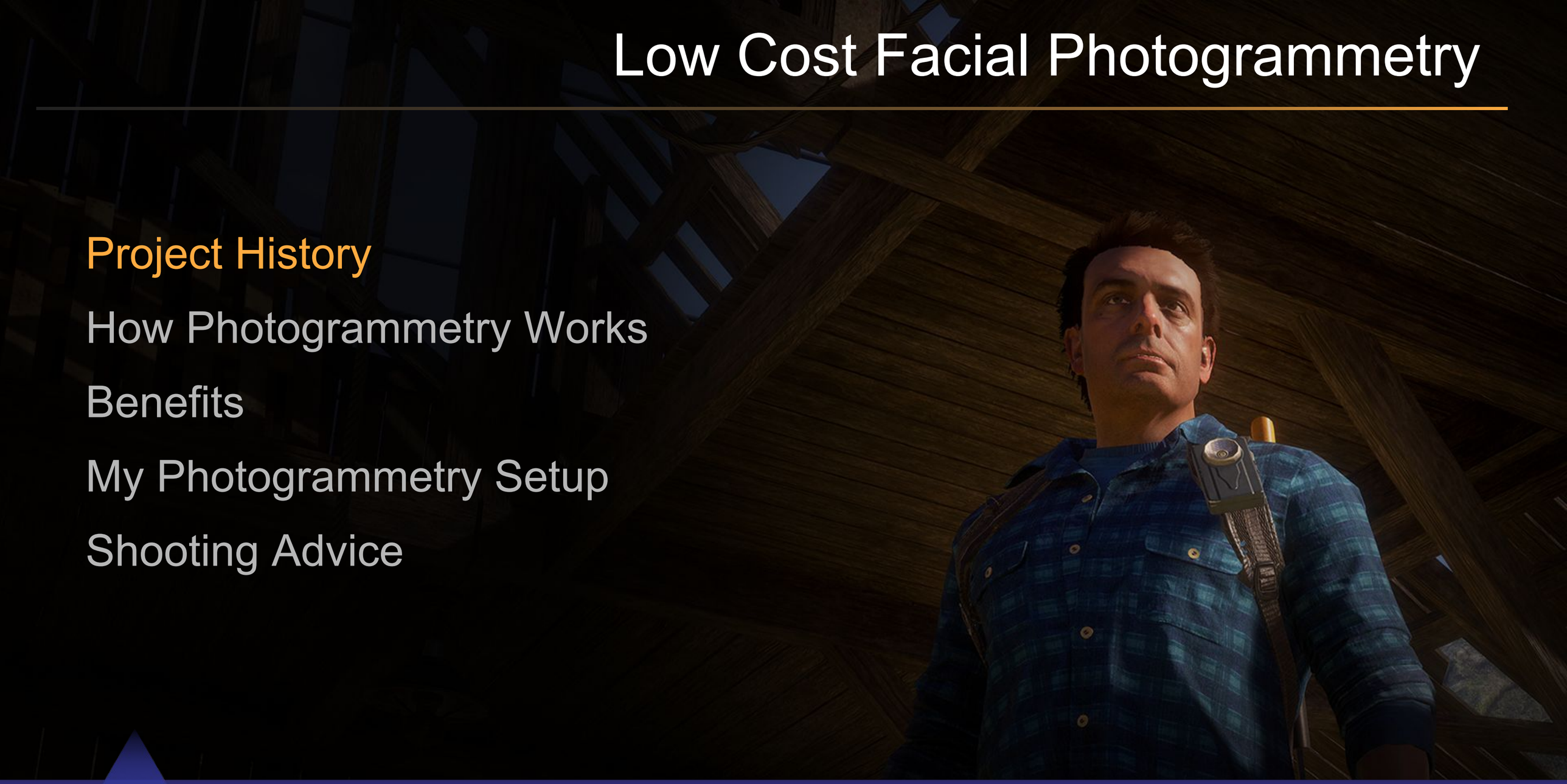
Low Cost Facial Photogrammetry

- Project History
- How Photogrammetry Works
- Benefits
- My Photogrammetry Setup
- Shooting Advice



STAR WARS
BATTLEFRONT
EA

THE
T·A·L·O·S
PRINCIPLE

The Vanishing of Ethan Carter

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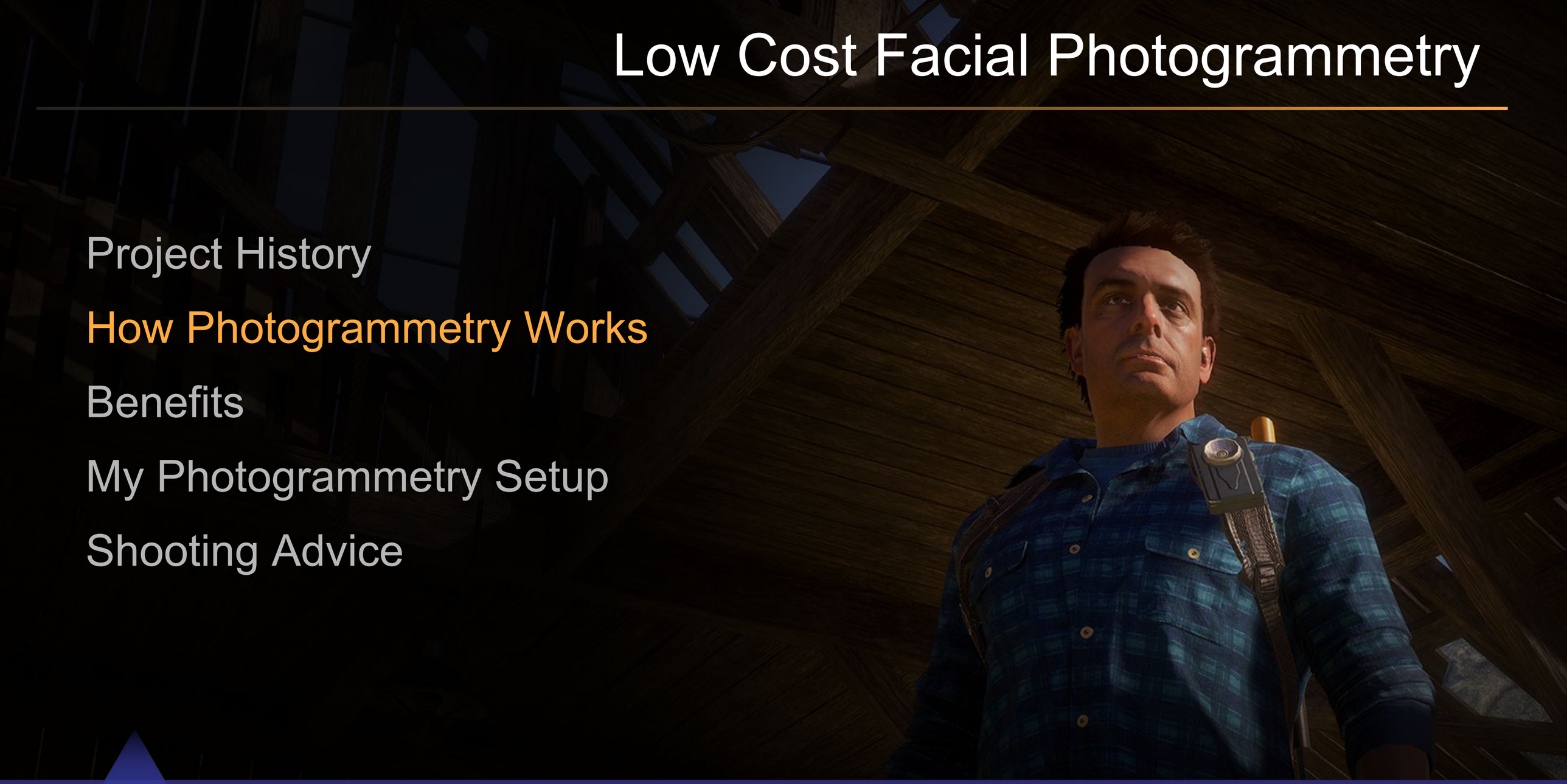
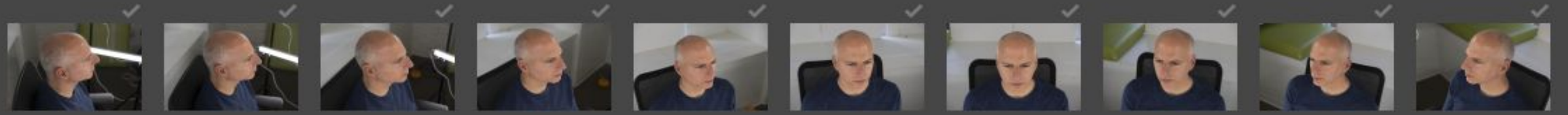


How photogrammetry works

Photogrammetry uses a series of photos to reconstruct a 3D model of a physical object.



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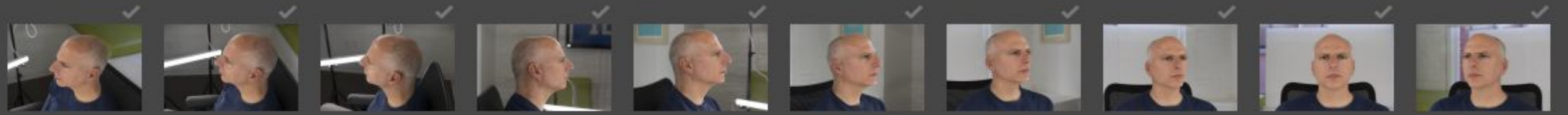

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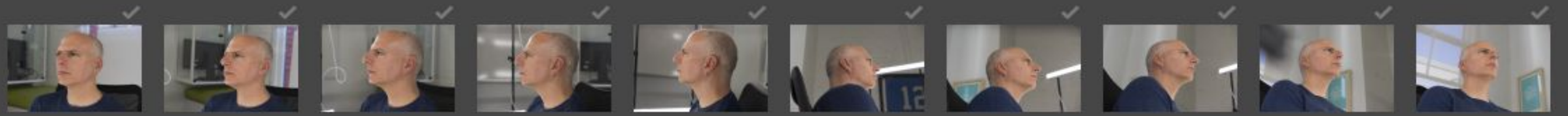

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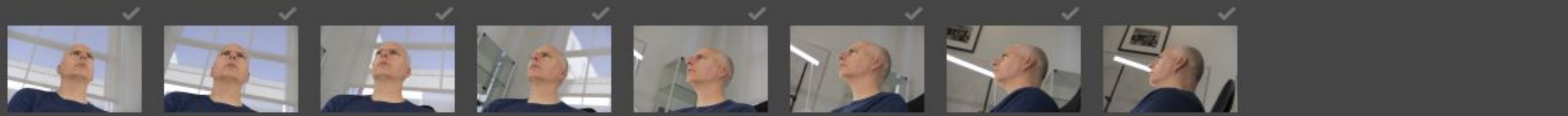
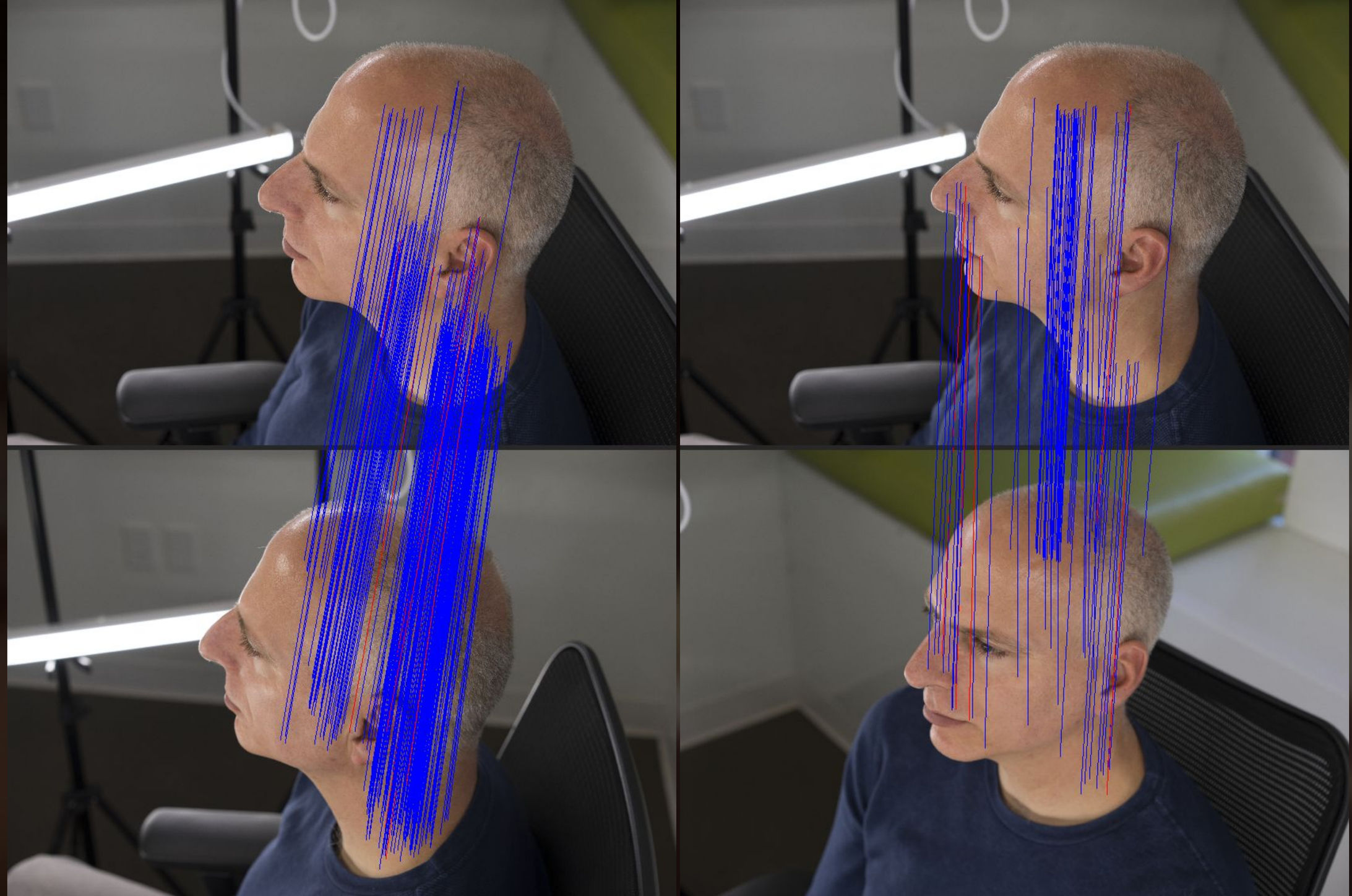
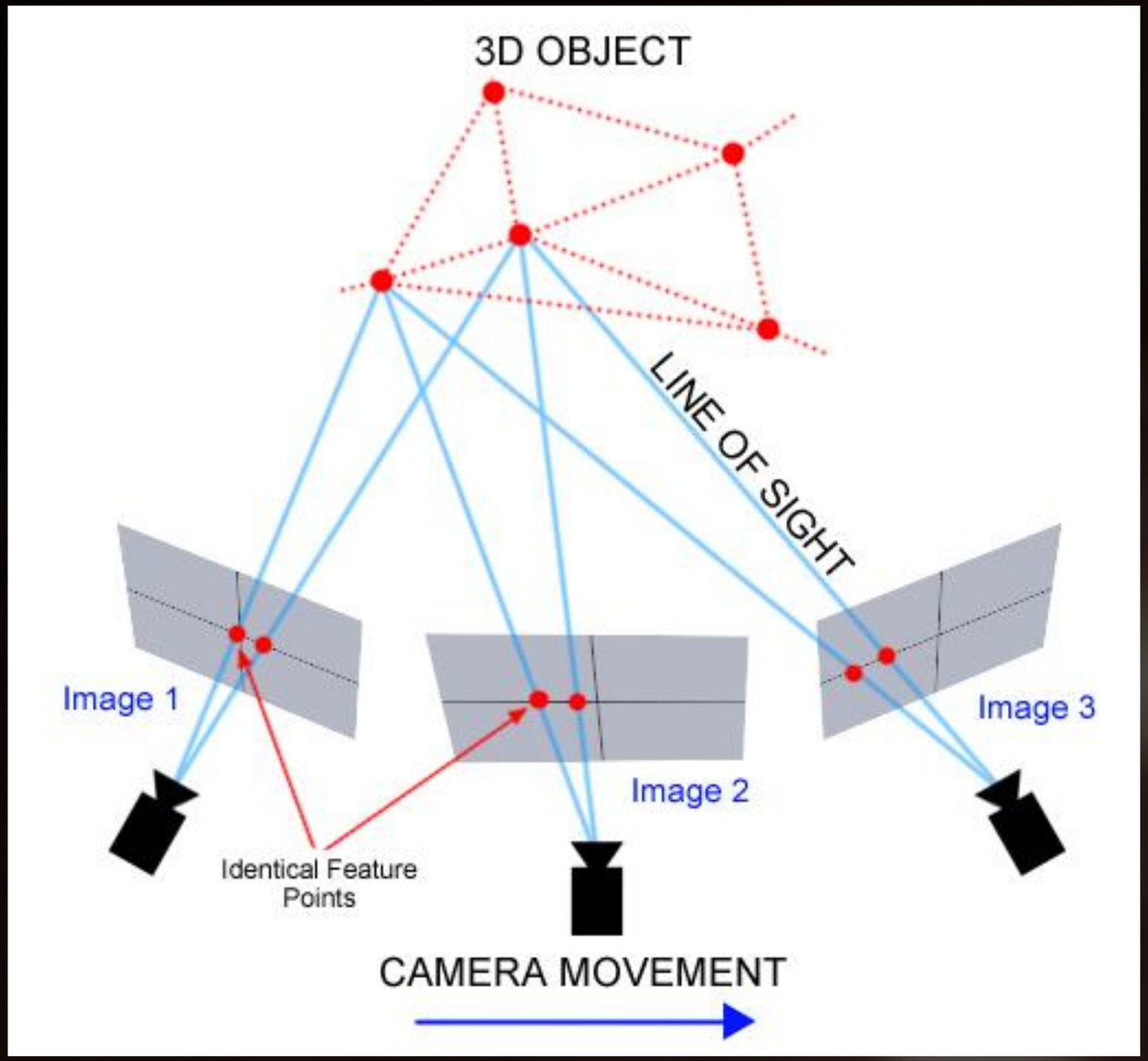


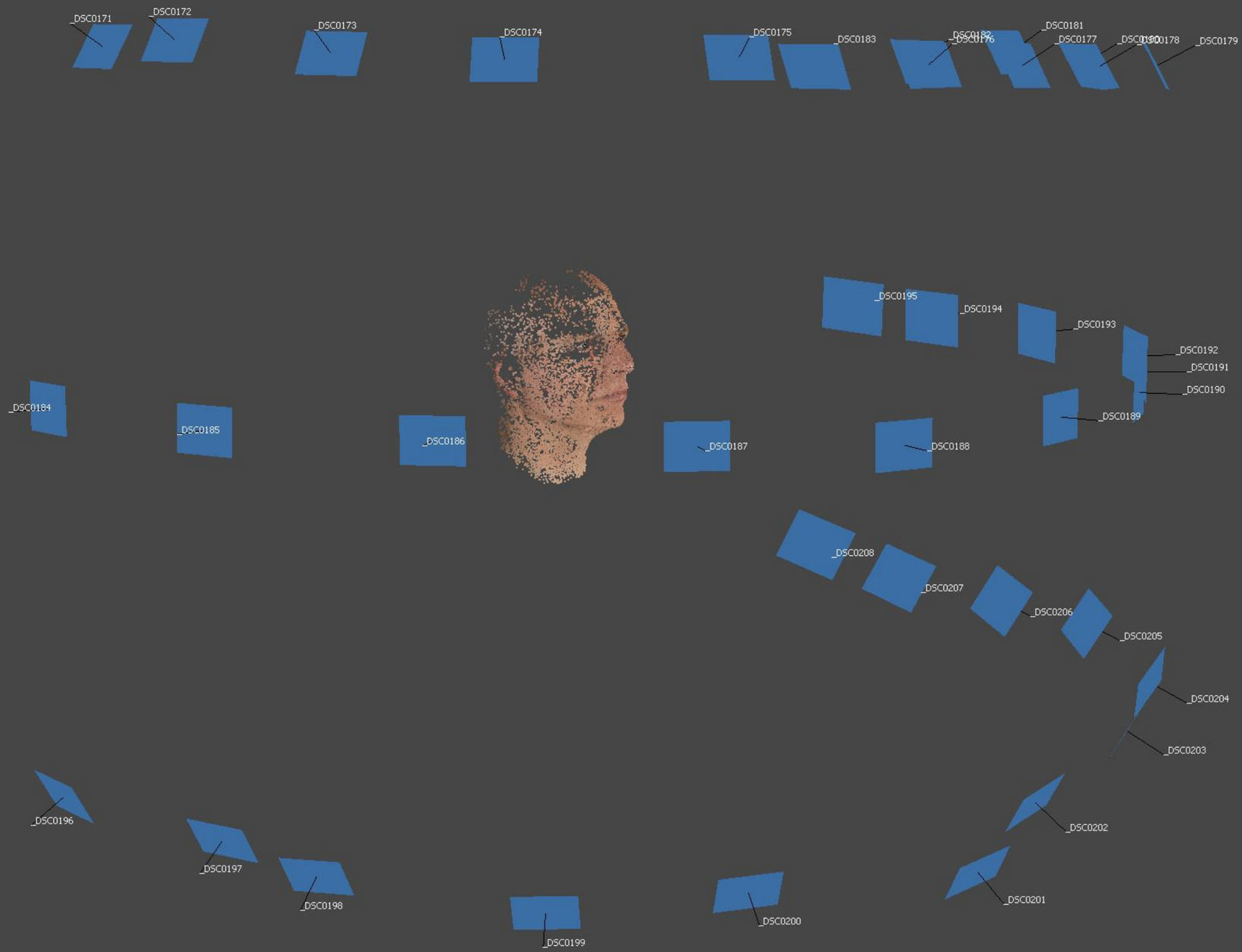
_DSC0201 _DSC0202 _DSC0203 _DSC0204 _DSC0205 _DSC0206 _DSC0207 _DSC0208

Agisoft Metashape
(formerly PhotoScan)

RealityCapture




3D OBJECT
LINE OF SIGHT
Image 1
Image 2
Image 3
Identical Feature Points
CAMERA MOVEMENT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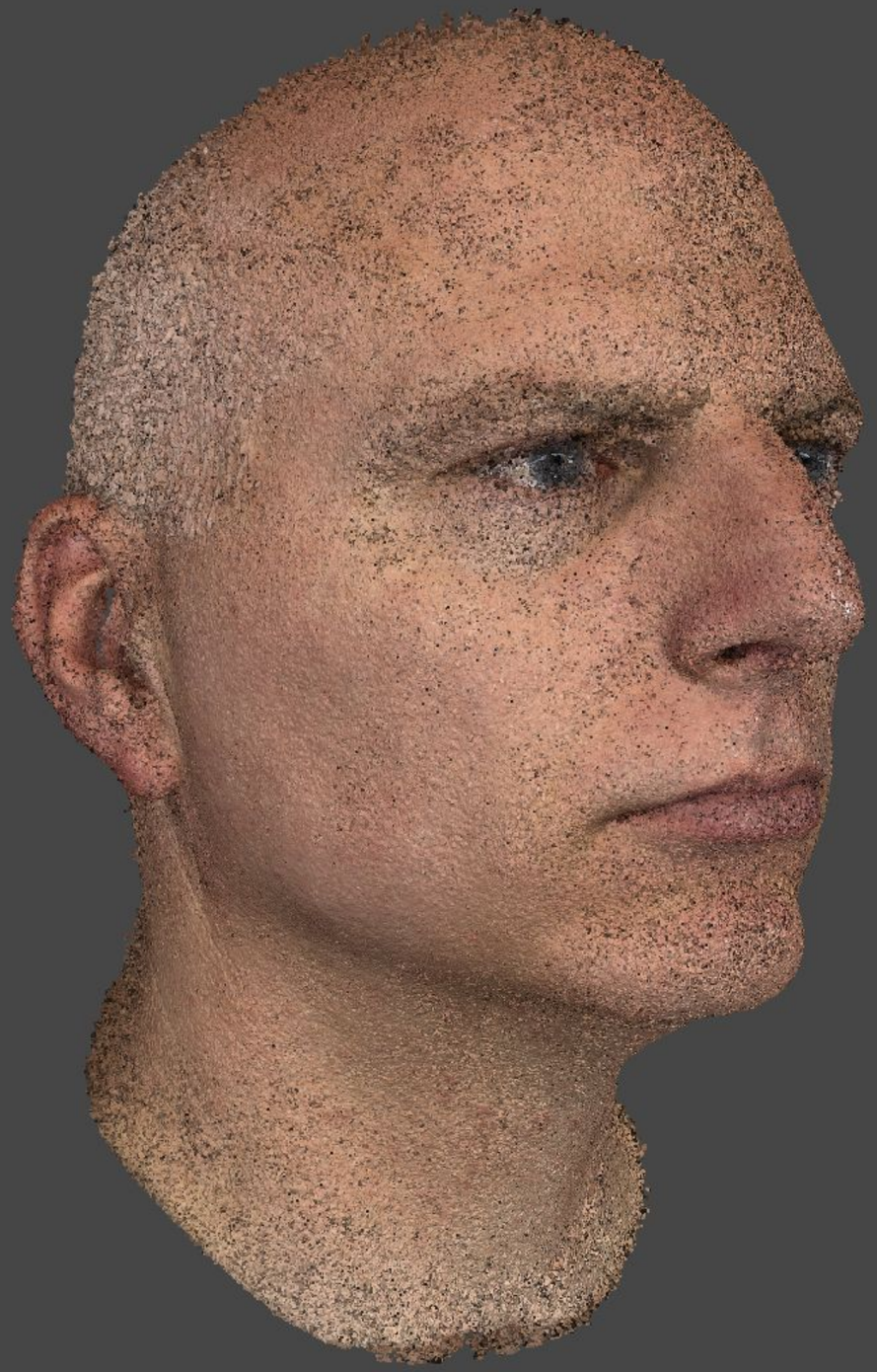
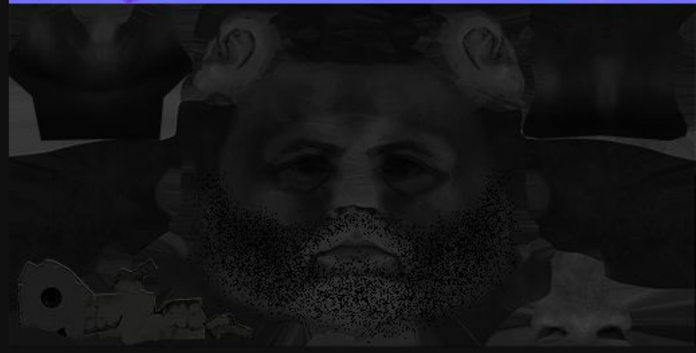




Low Cost Facial Photogrammetry

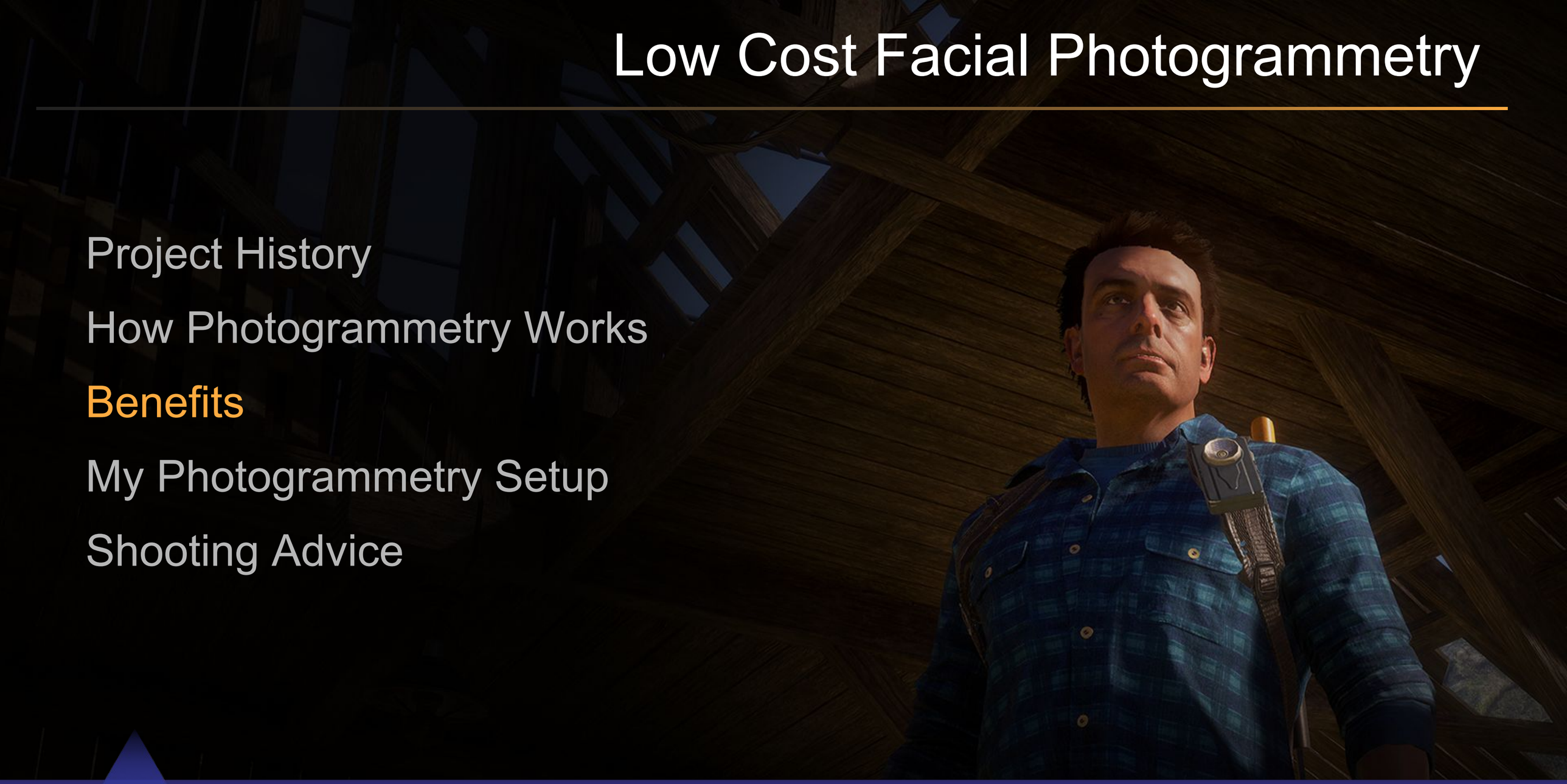
Project History

How Photogrammetry Works

Benefits

My Photogrammetry Setup

Shooting Advice



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- No specialized gear
- Faster than modeling from scratch
- Speeds up models that are the most time consuming
- Allows us to exaggerate facial features

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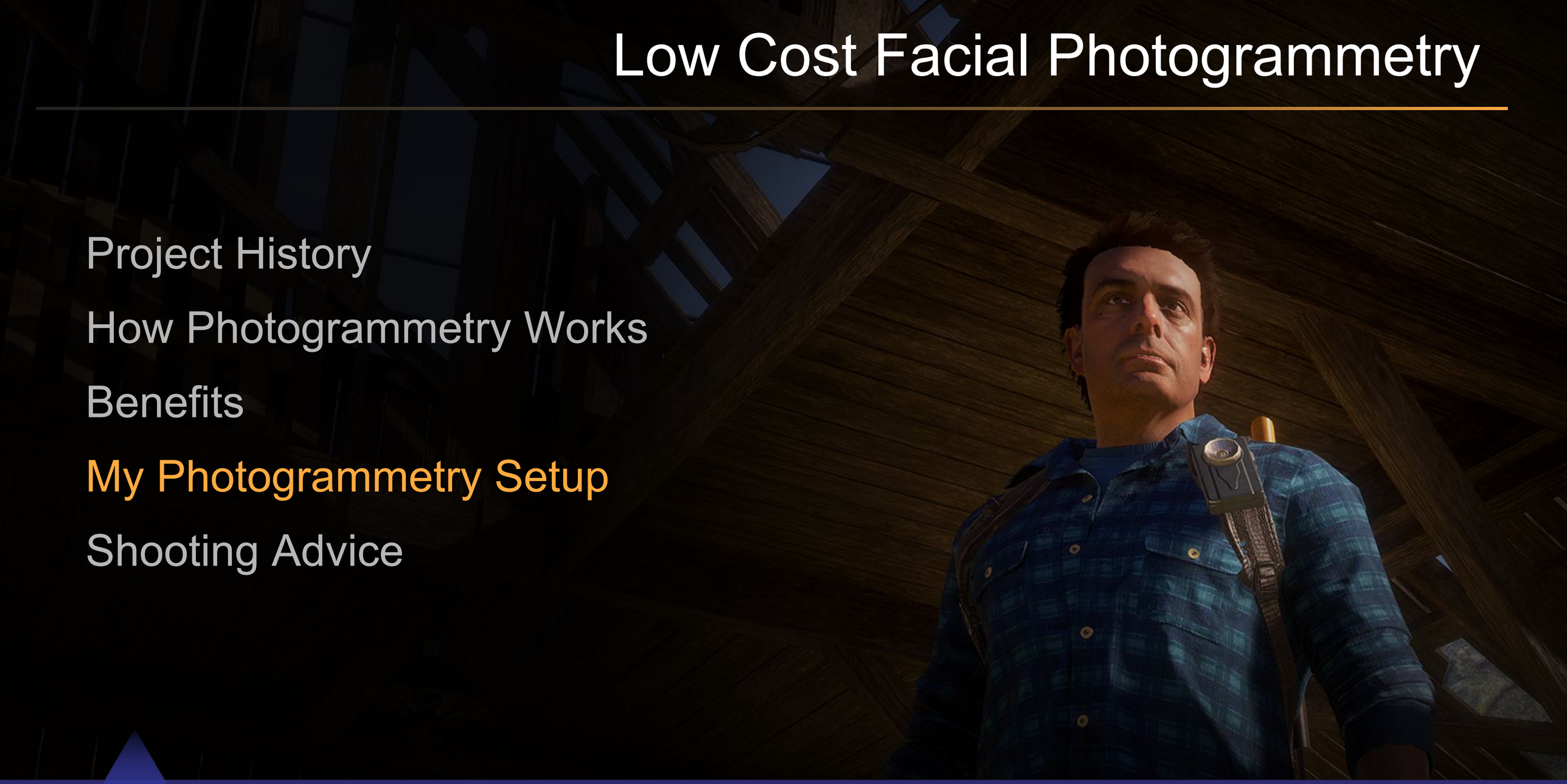
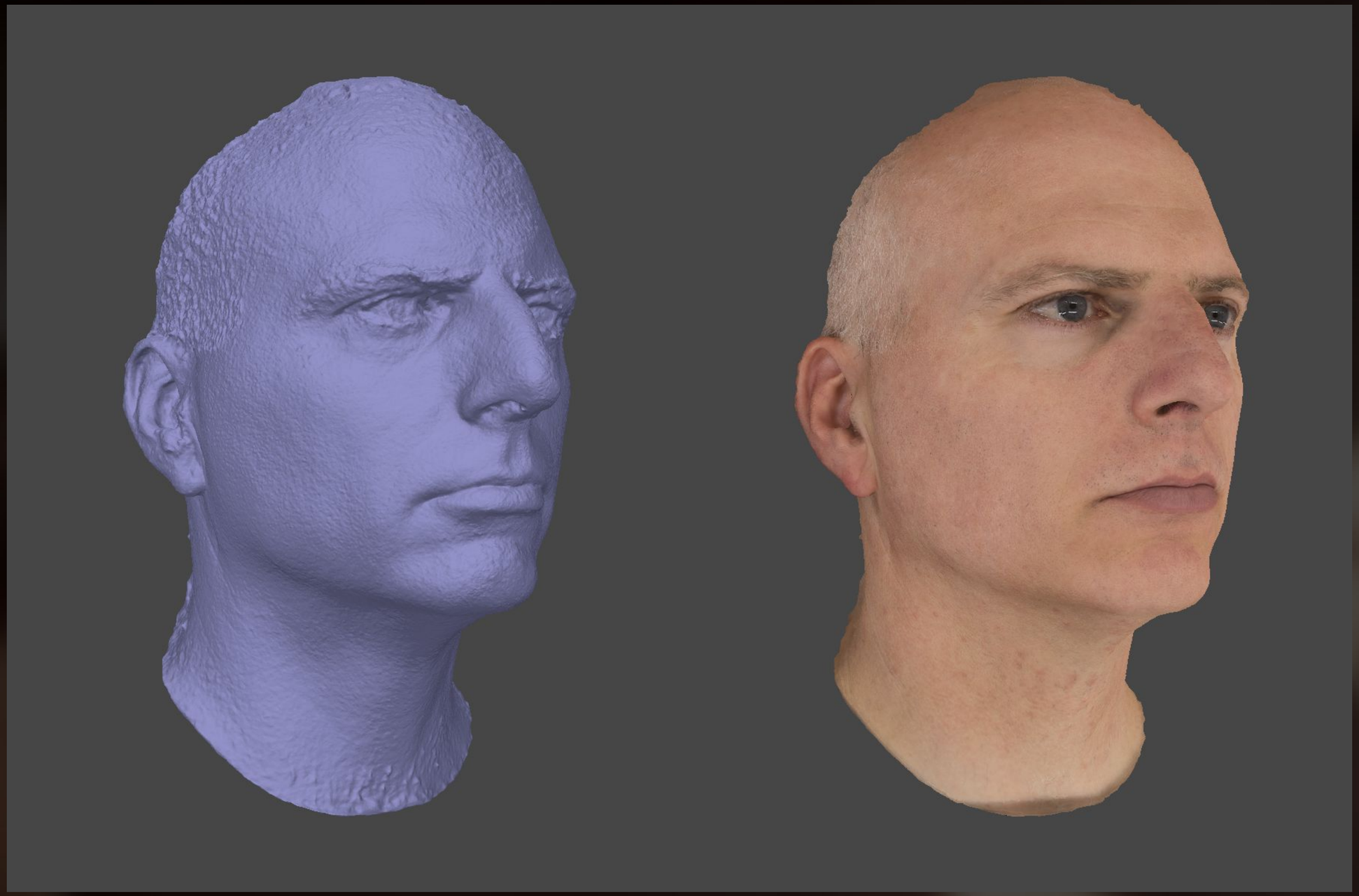


Photogrammetry rig by Pixel Light Effects

IR
MARMOSET
TOOLBAG 3

Finding the middle ground



Advantages of my setup

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- Inexpensive
  - Lights: $120
  - Stands: $240
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NEEWER
SONY
SONY

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- “Good Enough”

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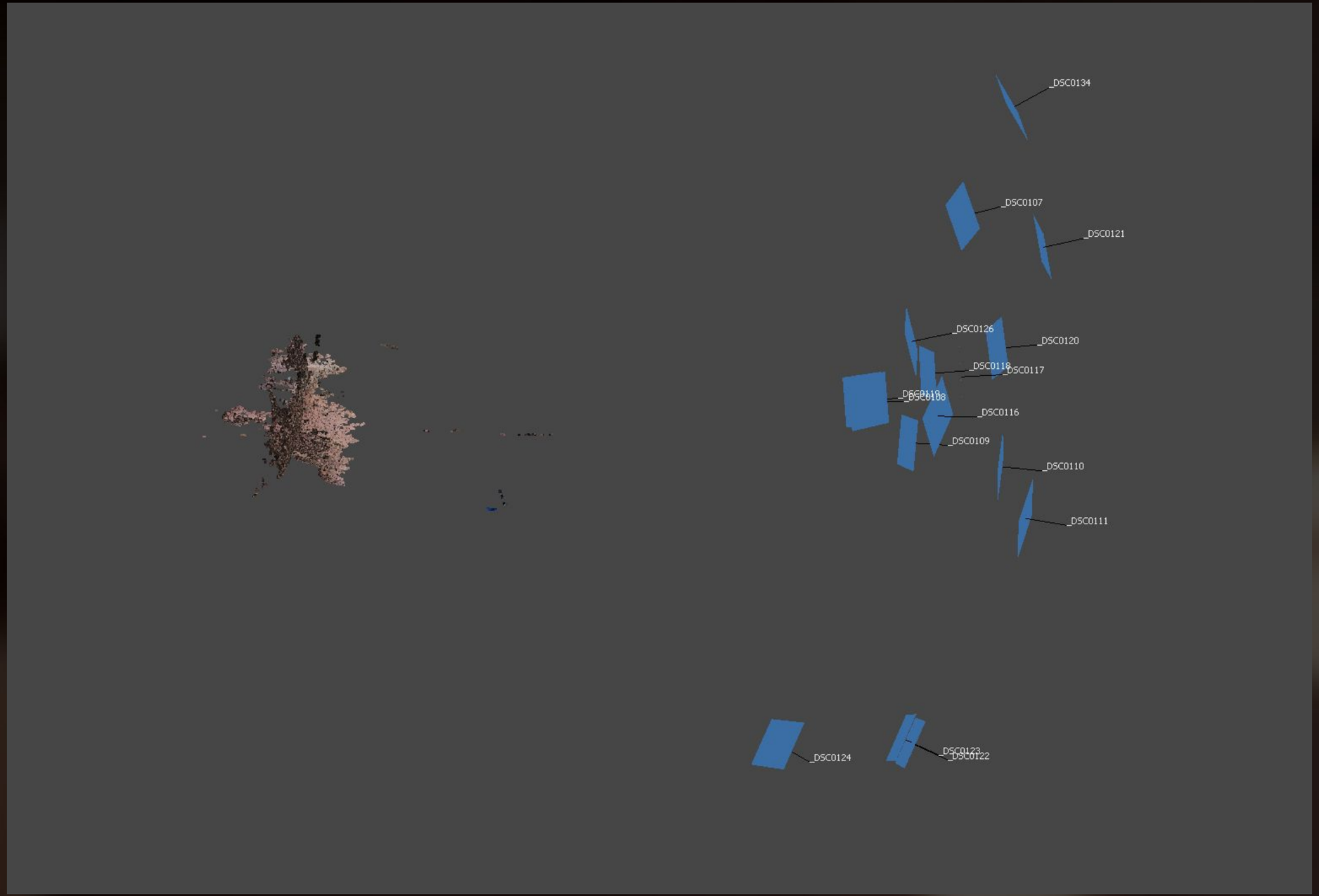
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_DSC0110
_DSC0111
_DSC0124
_DSC0123
_DSC0122

Get Your Head In The Game, Part 2

AUG 23 2016

by Sanya

Are you going to be in Seattle for PAX West, or are you close enough to Seattle to make a day trip out of it on September 2, 2016?

Are you at least 18?

Are you a member of the human race?

If you can answer yes to all three of those things, YOU are hereby invited to enter the Get Your Head in the Game Contest!

We aren't making a game with superheroes and supermodels saving the world. We're making a world where ordinary people are just trying to get by. If you saw Matt's brilliant article last week, you already know how we're getting characters into State of Decay 2 five times faster than ever before. And Matt himself volunteered to scan a few lucky members of our community, to make them into survivors.

Disadvantages of my setup

- Model clean-up time
- Some scans just don’t work
- Subject movement

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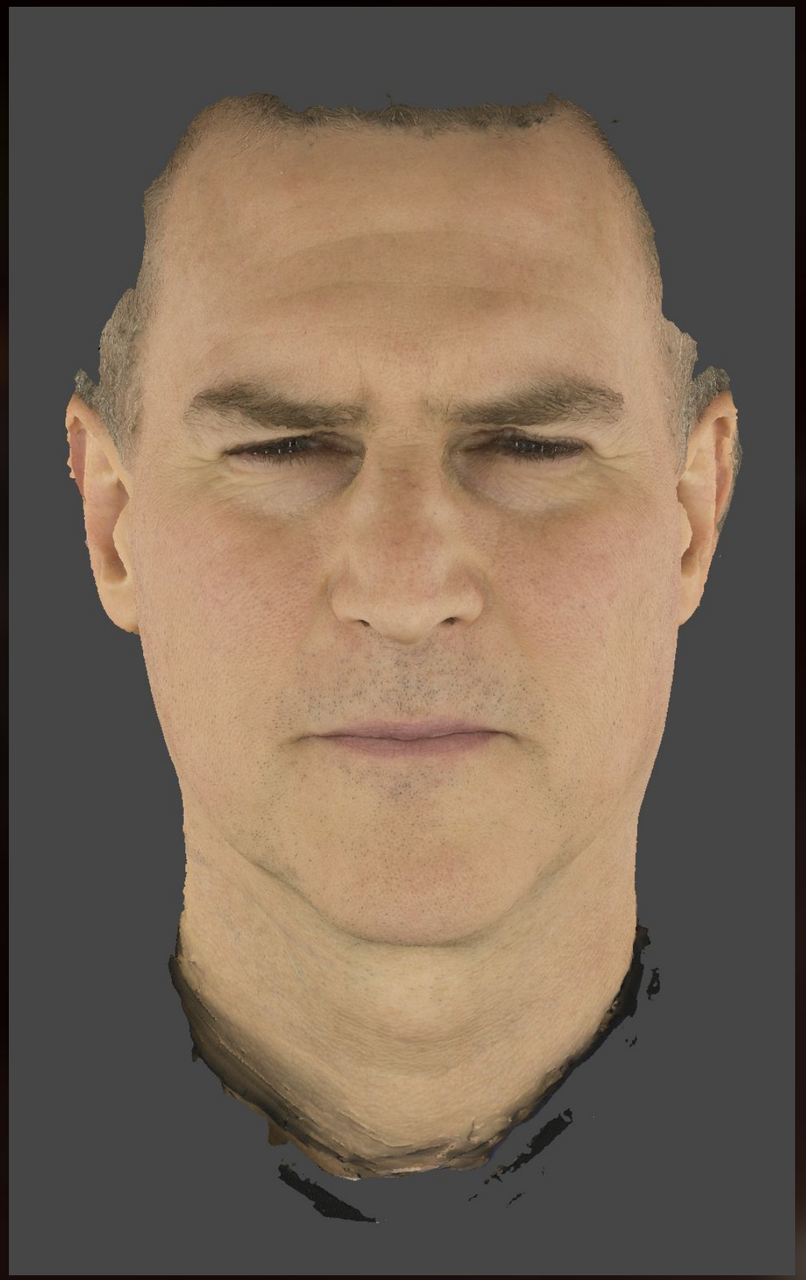
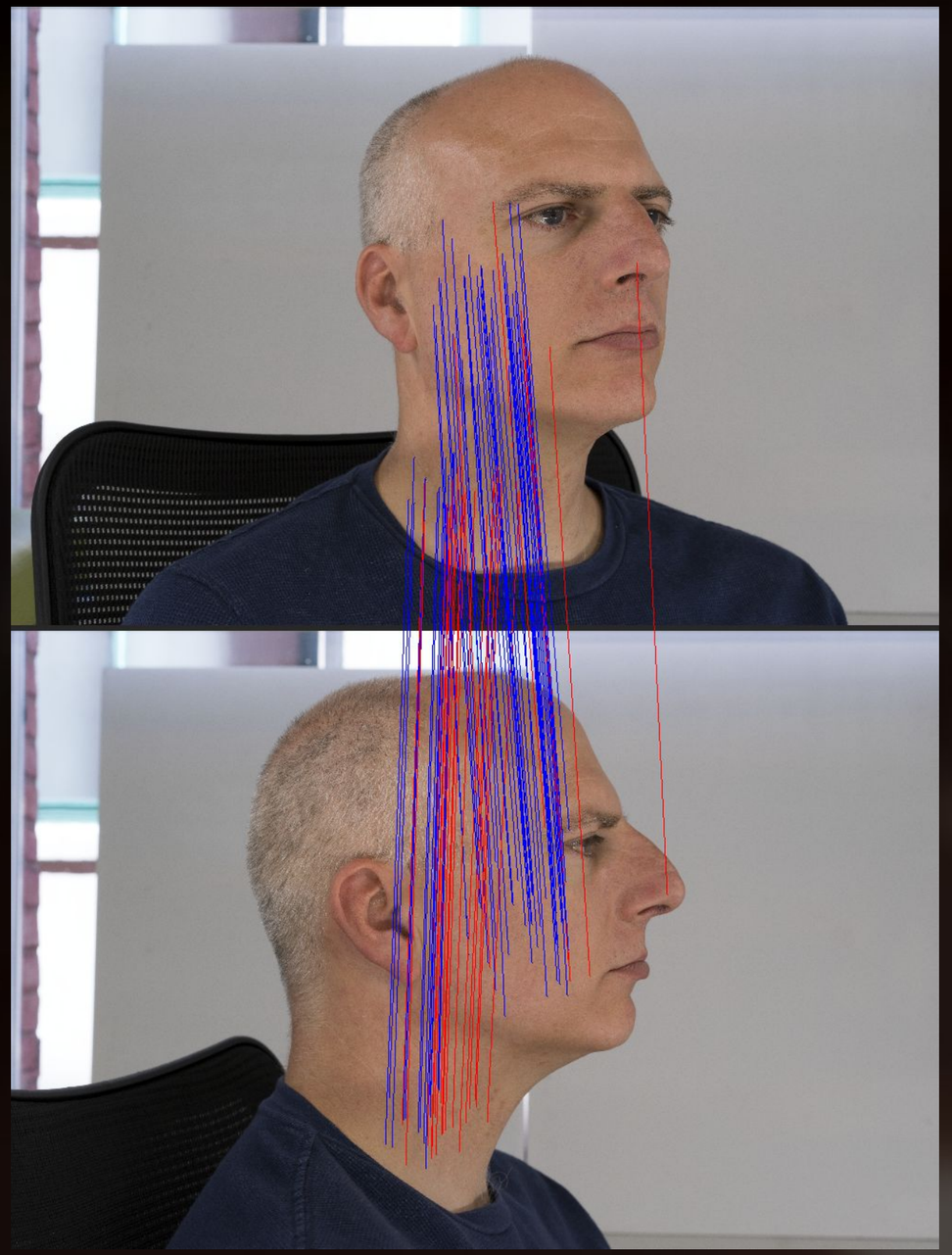
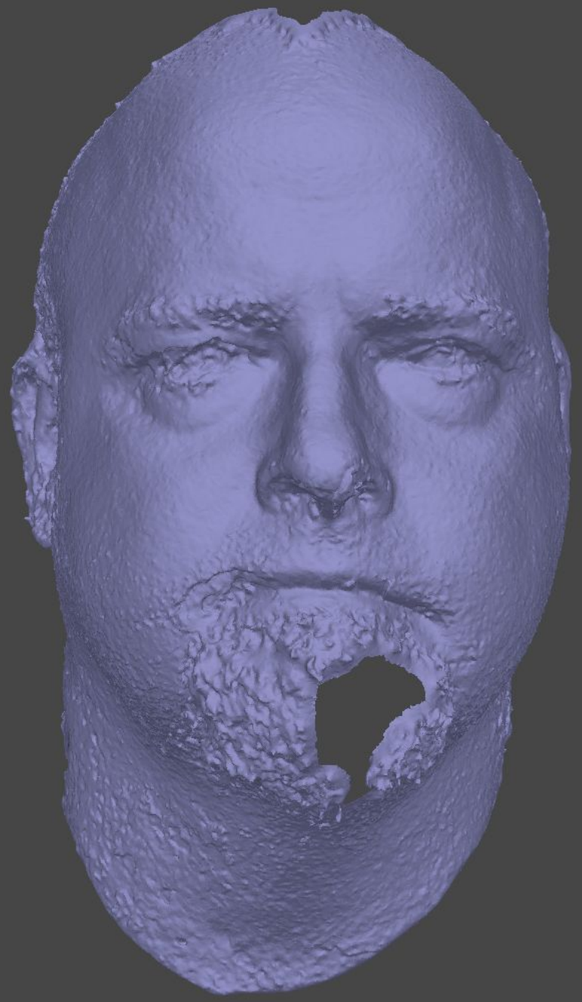
- Subject movement
- Comfort of the subject



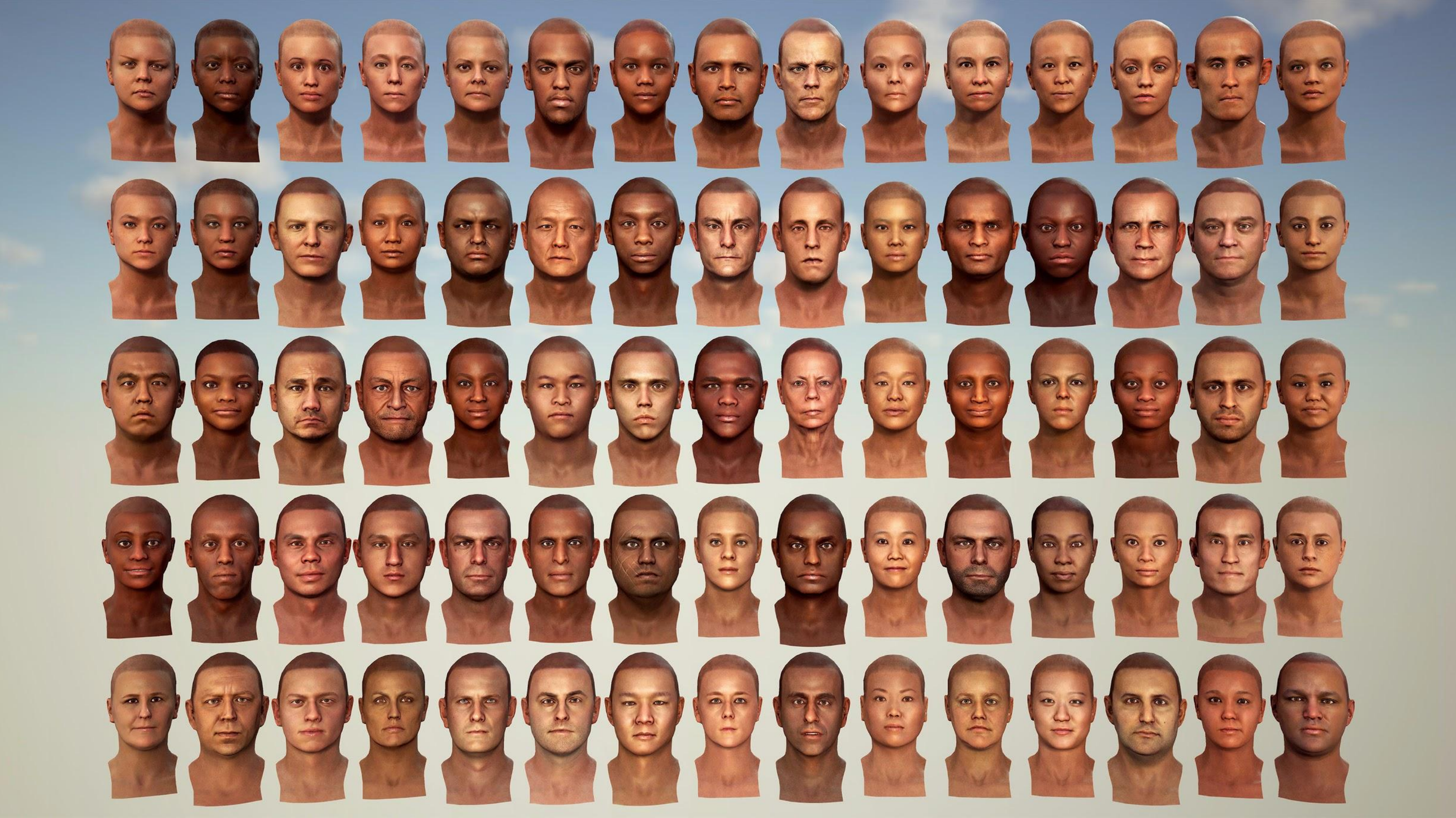
Disadvantages of my setup

- Clean-up time
- Some scans just don’t work
- Subject movement
- Comfort of the subject
- Can’t scan facial hair





Final Results



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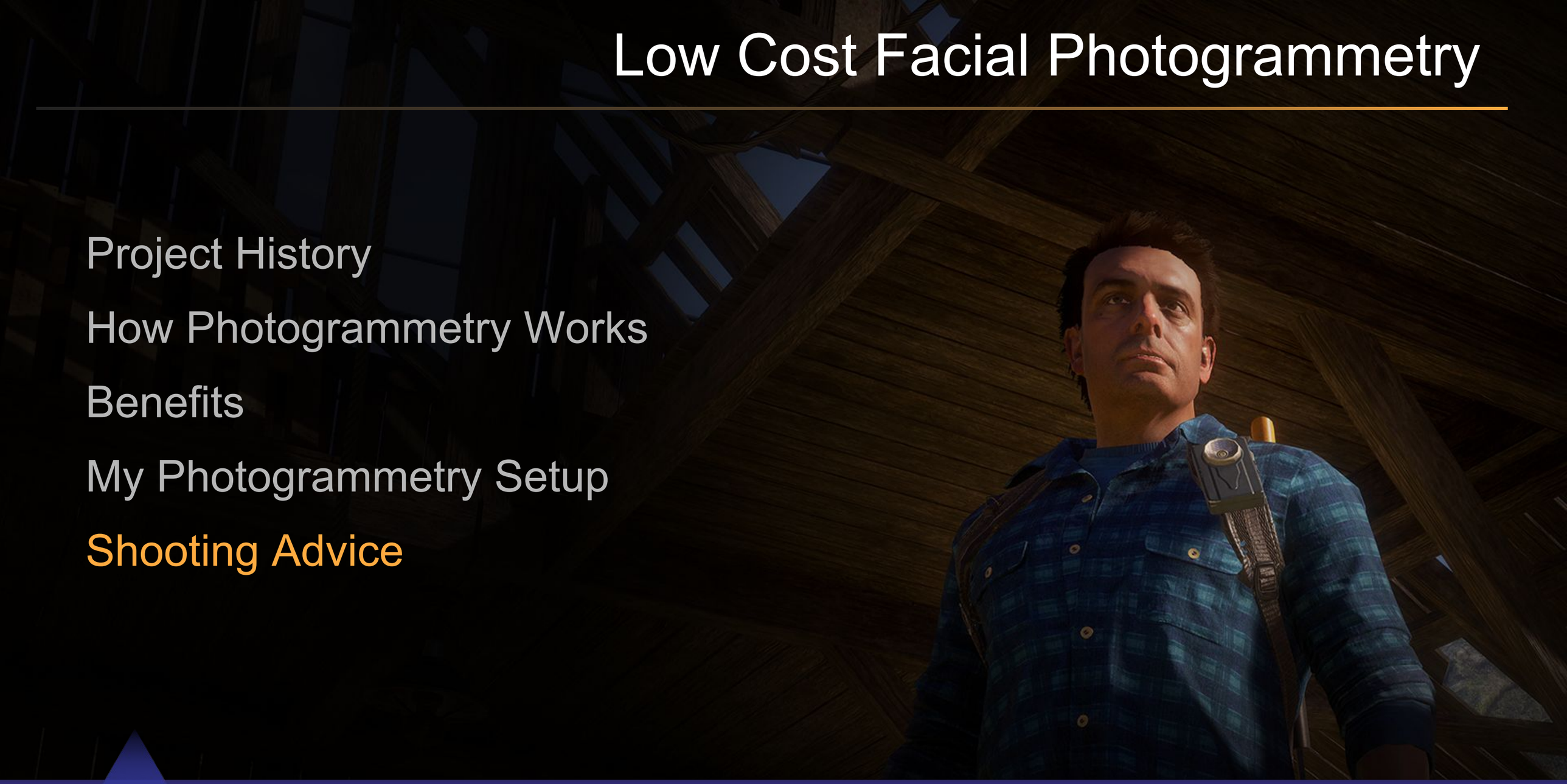


Shoot in manual

- Avoids auto adjusting exposure between shots.

Shoot in RAW

- Allows lossless global exposure adjustment
- Avoids compression artifacts

Sharpness > Resolution

- Too many pixels is wasted disk space
- Sharpness is key

Don’t adjust photos in post

- Can result in differences from one image to another.
- Occasionally had to adjust exposure, but used as a last resort.

Oily skin

- Shiny surfaces don’t scan well.
  - Specular highlights move across the surface
  - Confuses the software.

laura mercier

Natural colors

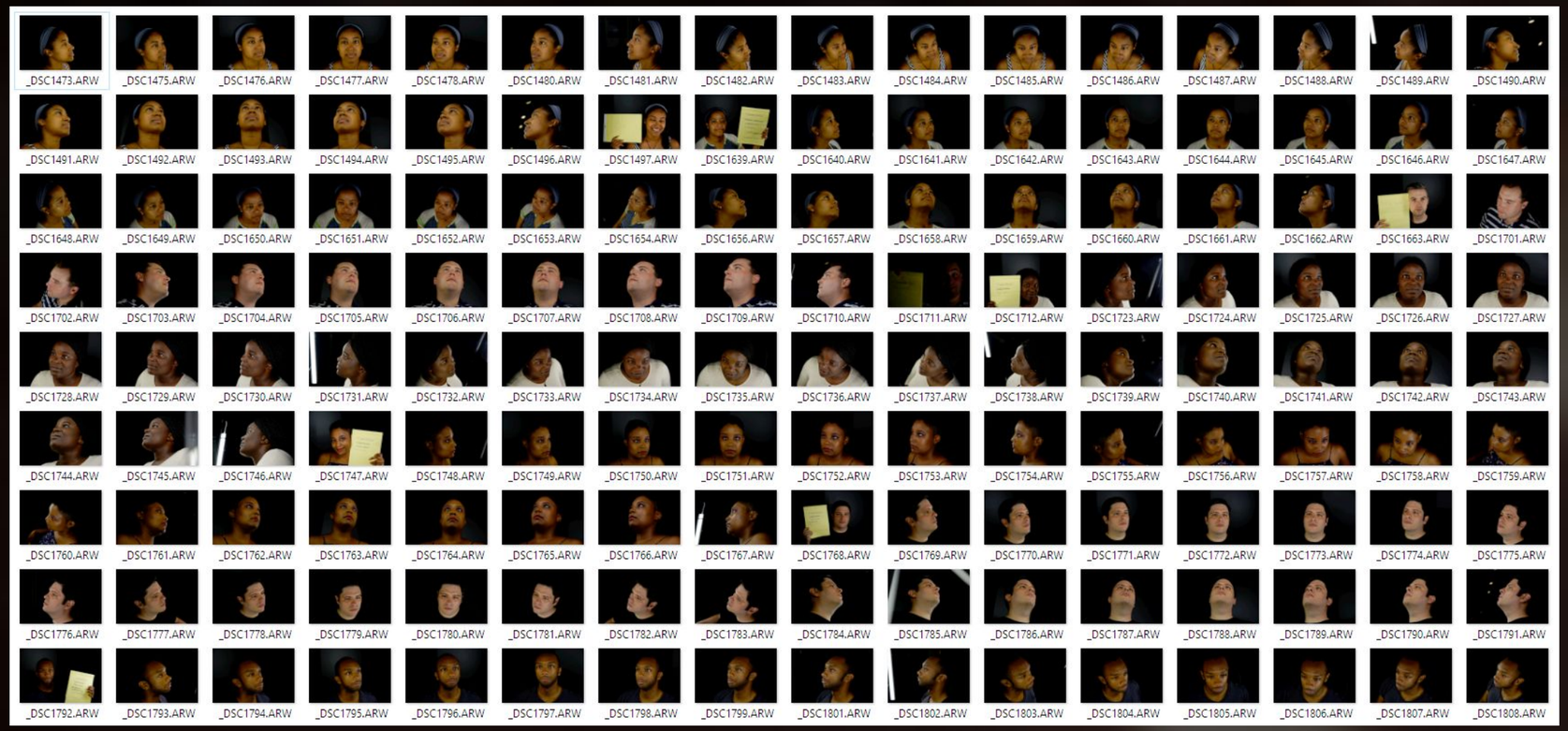
- We wanted post-apocalyptic faces
- Asking for “No Makeup” dissuaded volunteers

Photograph subject with their name

- Prevents decoupling of name/face pairs.

Photograph Subject With Their Name

- Prevents decoupling of name/face pairs.
- Helps with delimiting photo batches



Rotate model or move camera?

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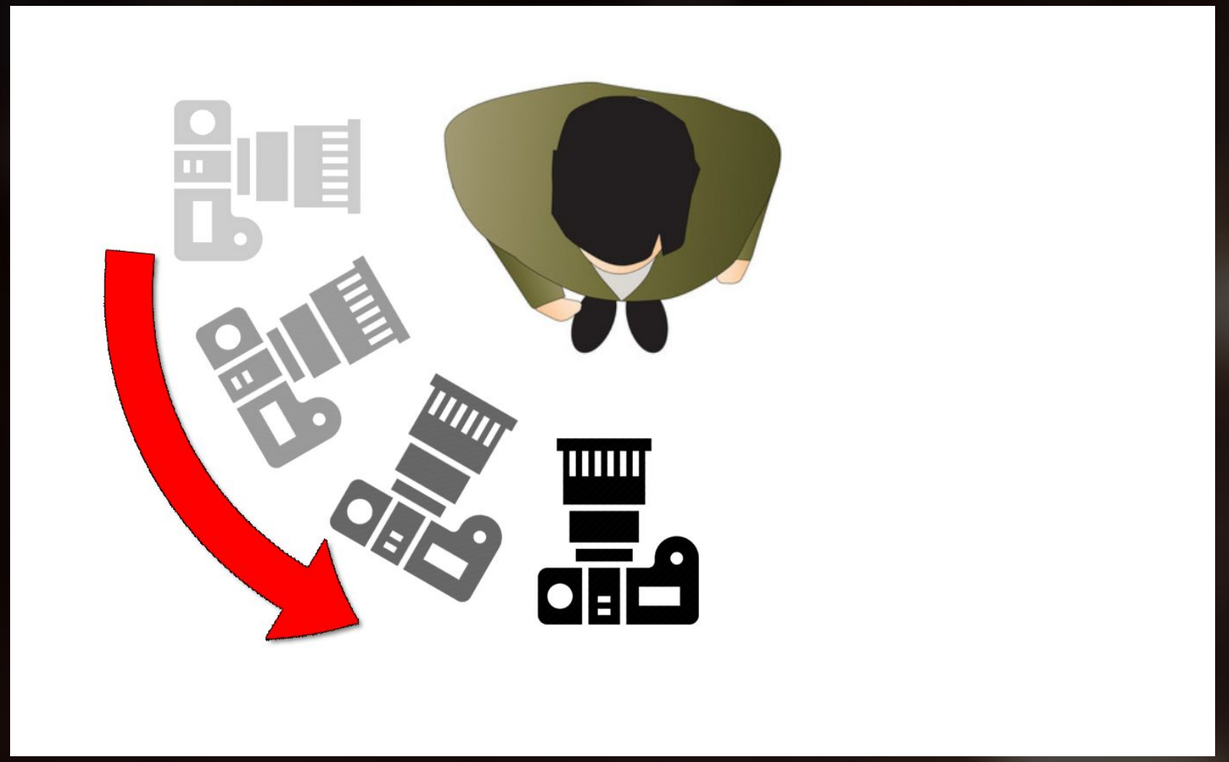
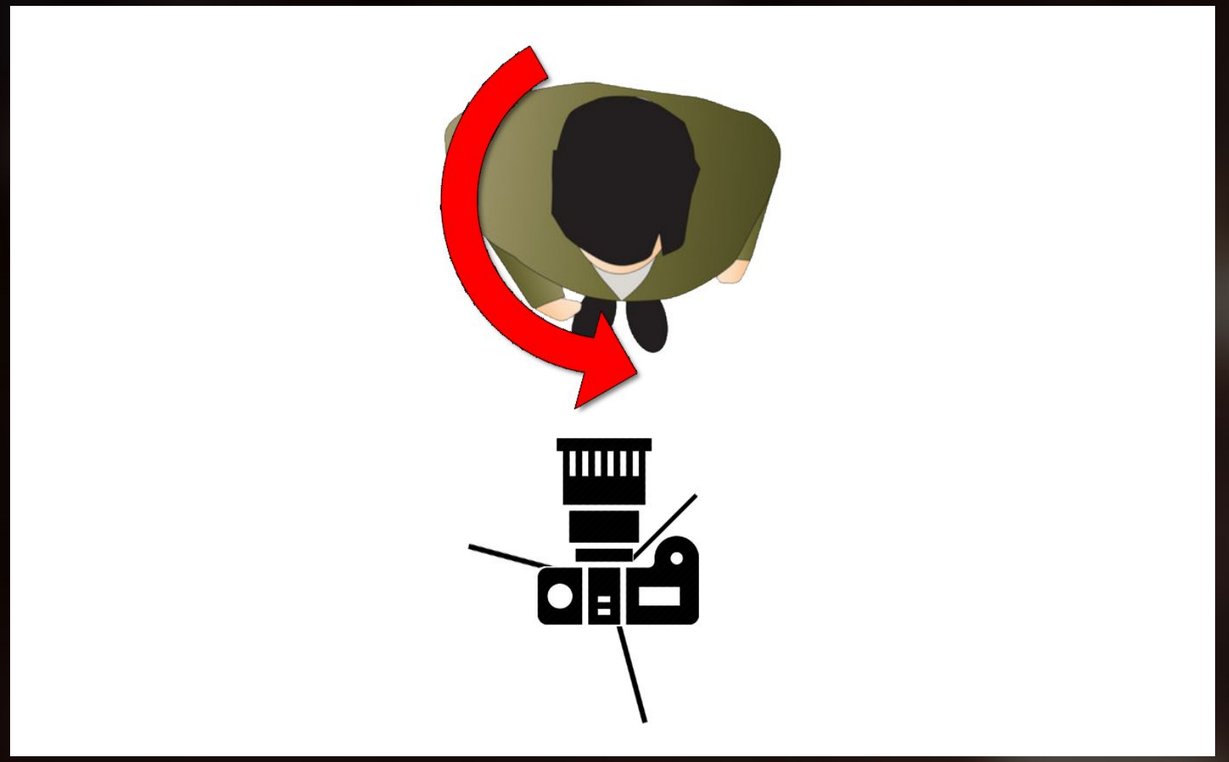
- Moving the camera = less movement in your subject
- Problems with handheld camera blur.



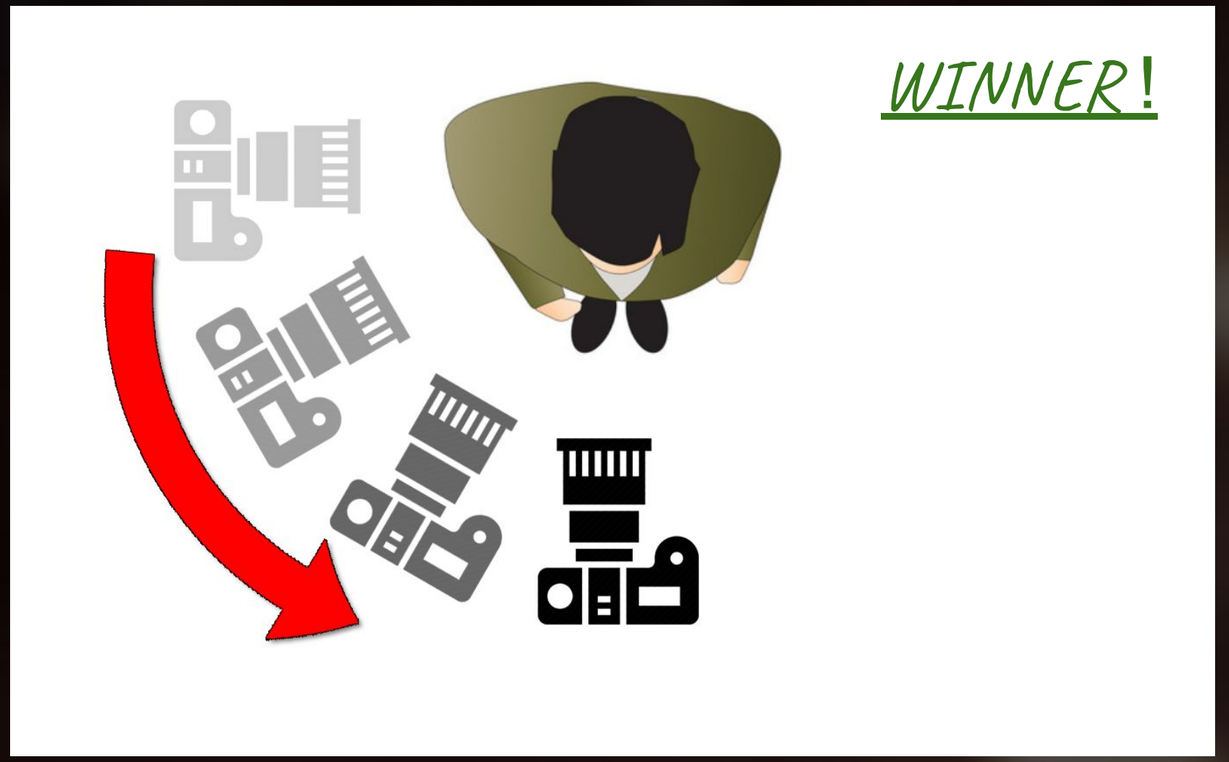
Rotate model or move camera?

- Rotating the model = more even lighting
- Higher probability of subject movement.



Rotate model or move camera?

- Ultimately decided on stationary subject, moving camera.
  - Lower quality, higher consistency



Wrapping up

Photogrammetry can be a great tool to boost your production, regardless of your budget.

Thanks!

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