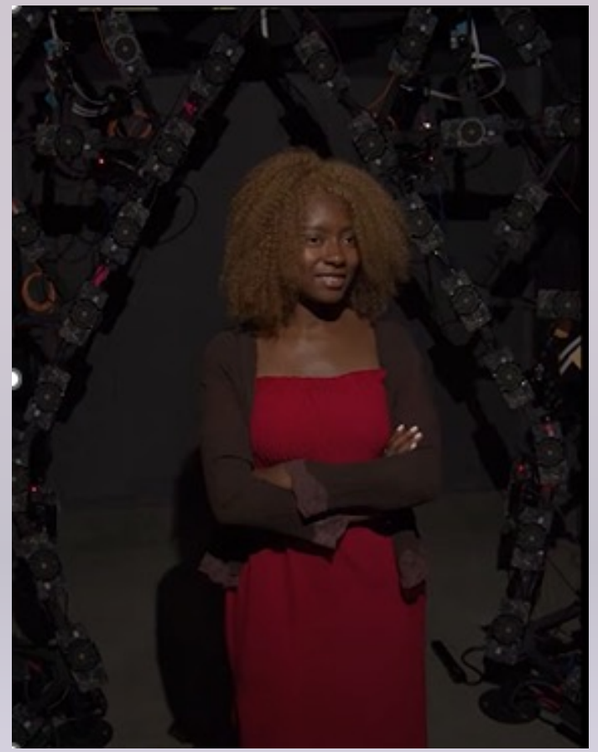
3D Human Digitalization

- Light Stage: Too complicated and expensive

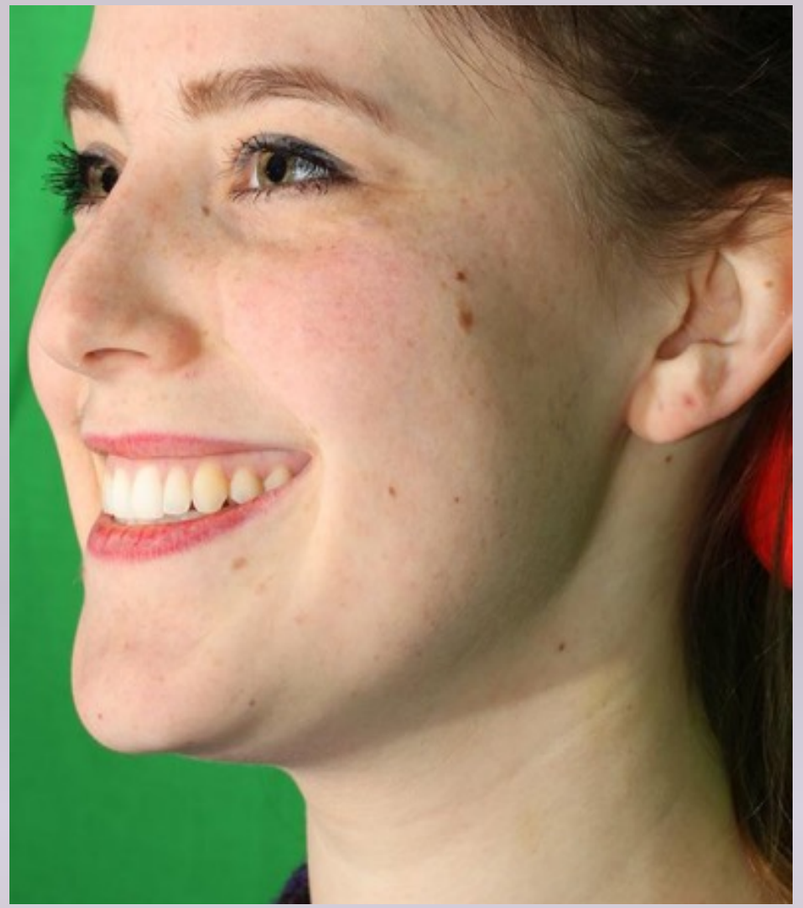
Guo19



Pandey21

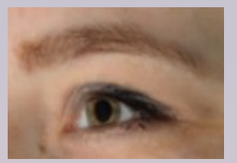
3D Human Digitalization

- Multi-view Capture: Complicated and not user-friendly

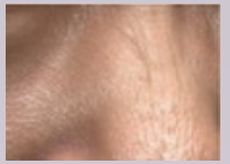


A view of input Images

Beeler11

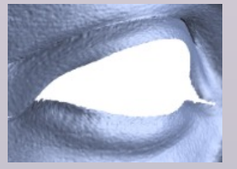


Beeler12



Nagano15

Berard16



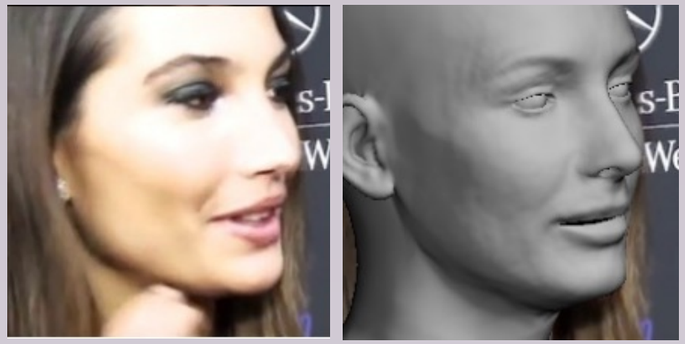
Bermano16

Chai16

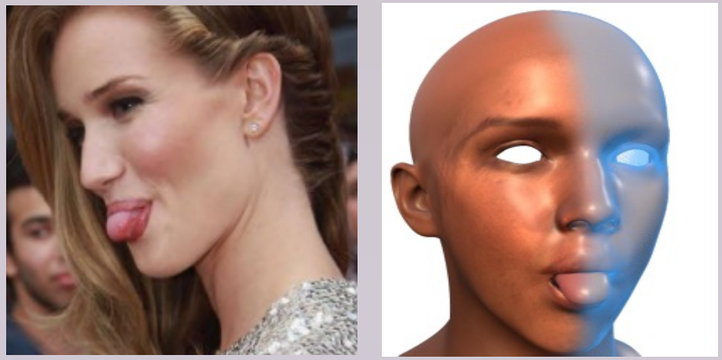
Wu16

What is the easiest way?

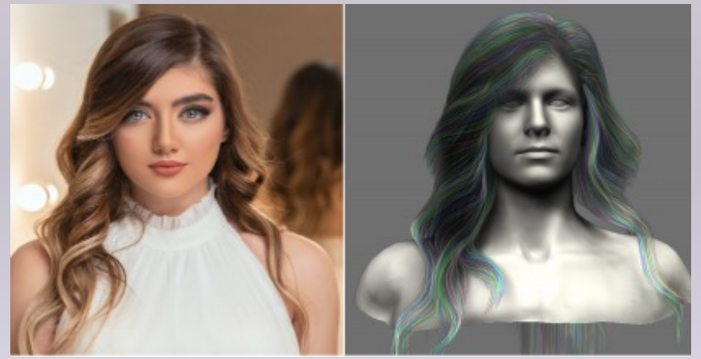
- **From Single Images**



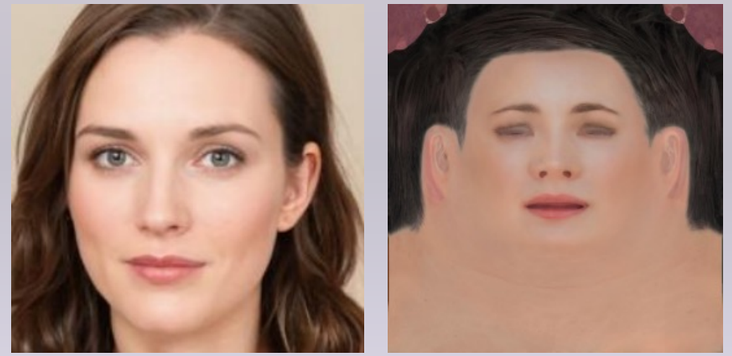
Face (*Feng21*)



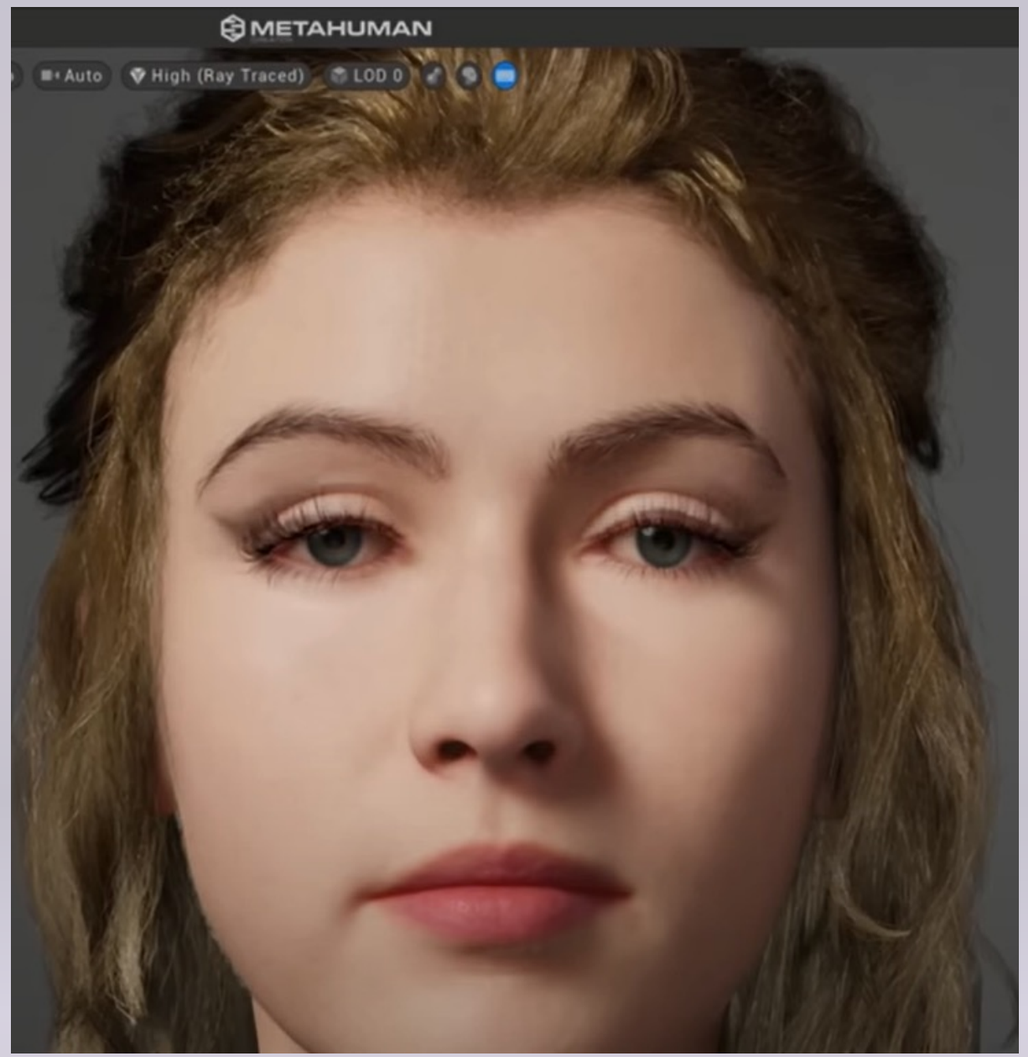
Tongue (*Ploumpis22*)



Hair (*Wu22*)



Texture (*Bai23*)



MetaHuman (*Unreal Engine21*)

✅ Integrate into a 3D digital portrait

❌ Lack of facial hair (e.g. 3D eyebrow)

First issue: Lacking data

- Existing 3D scalp hair dataset:

...

...

Facial hair dataset

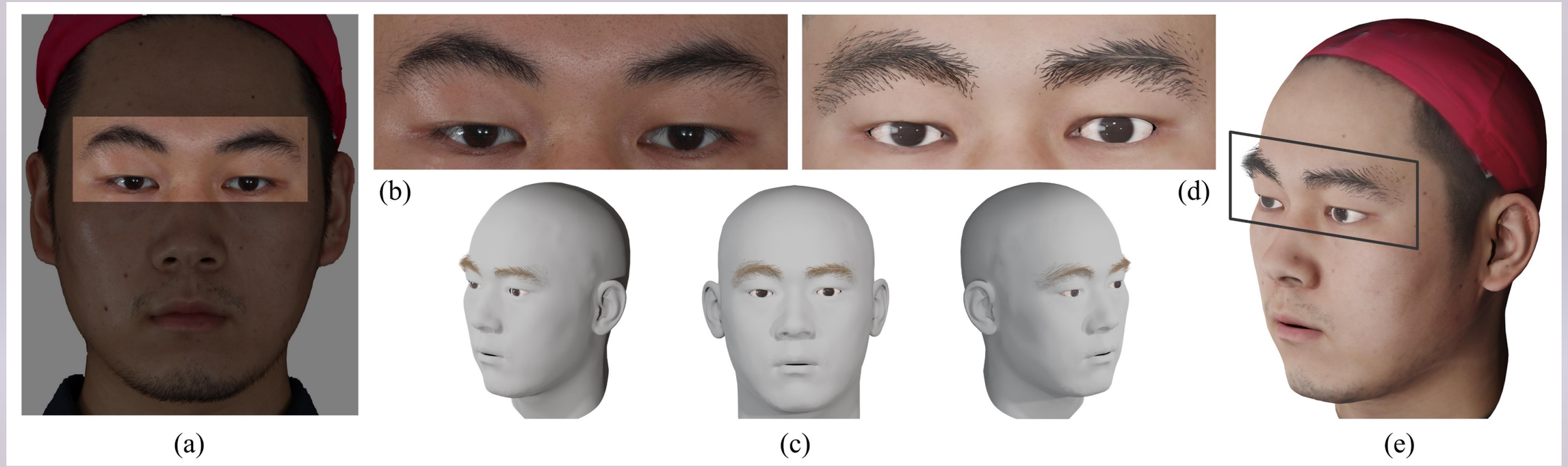
?

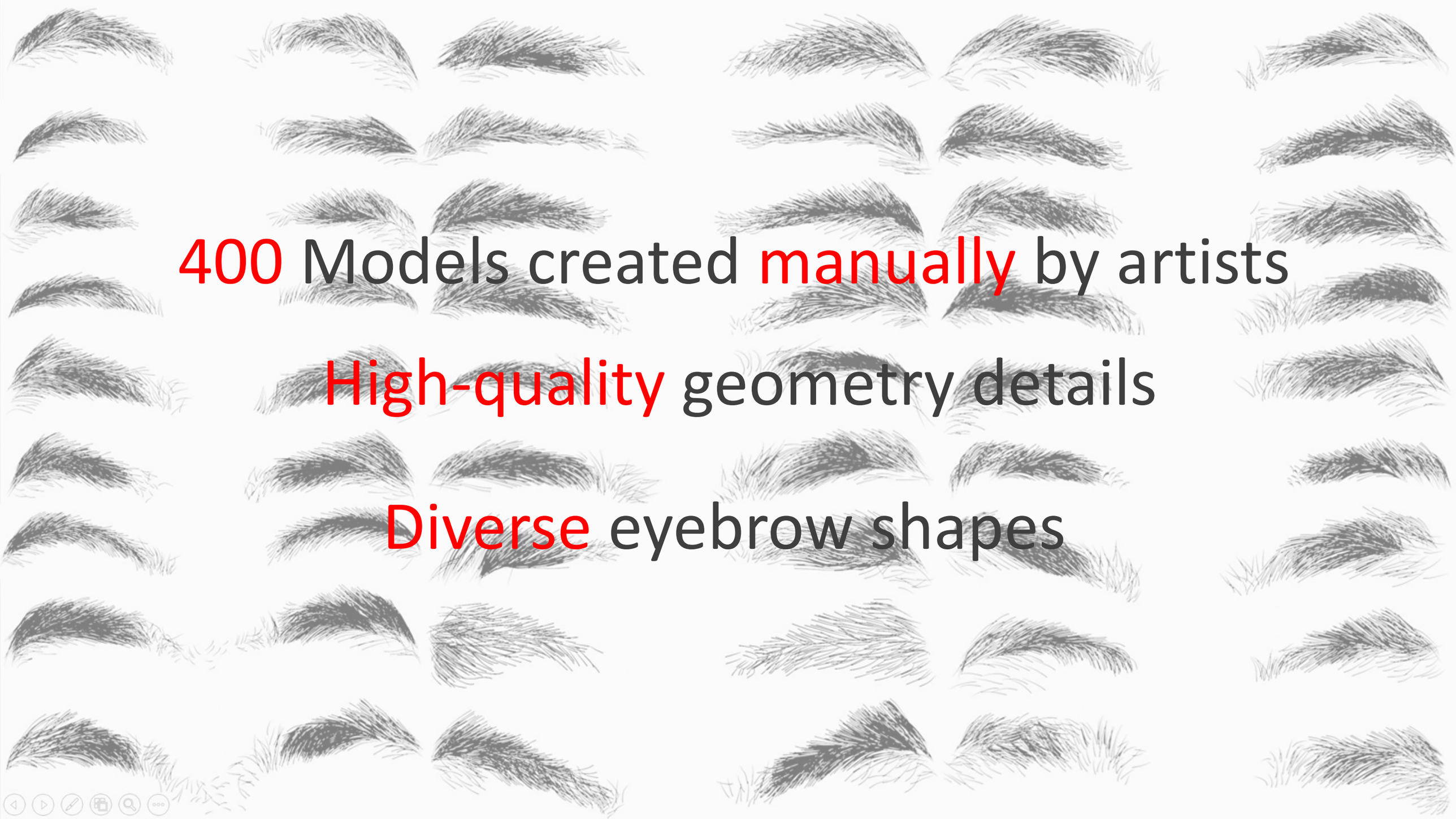
Hu15

Shen23

EMS:

- The first high-quality 3D synthetic eyebrow dataset *EBStore*
  - *based on Facescape Dataset, created by artists in blender (Hair Particle System)*
- A novel system for single-view eyebrow reconstruction
  - *integrated three modules: RootFinder, Oripredictor, FiberEnder*




400 Models created manually by artists
High-quality geometry details
Diverse eyebrow shapes