Widescreen Test Pattern (16:9)

Aspect Ratio Test

(Should appear circular)
BUILDING AN EMPIRE
ASSET PRODUCTION IN
RYSE: SON OF ROME
MARIUS ON XBOX ONE

- ~85k Triangles
- > 815 Joints
  - ~585 deforming (260 facial)
  - 250 Corrective Facial Blendshapes
  - Culled by priority and distance

BLEND IN / OUT
Physicalized Joints [~70]
- Hinge, cone, prismatic, plane
  - Cloth, Leather, Armor, Muscle, Fat

Cloth
- Sim mesh drives render mesh
  - Runtime ‘wrap’ deformer
- Targets animation [evade]
- [Examples] [Editor]
FACES

- FACS-based rigs
  - Scan reliant
    - art can deviate ~20%
FACIAL TECH

- 8 Skinning Influences
- Tangent update
FACIAL TECH

- 8 Skinning Influences
- Tangent update
- Granular LOD Tech
  - Cull meshes
  - Unique distances
  - Change skinning/shaders

UNLIT WIP
FACES: TO RIG OR NOT TO RIG?

Why not use 4D scanning?
- Seated capture
- Not editable
- Inconsistent
- Doesn’t support LOD / doesn’t scale
- No dynamic playback
- Lips and eyes
- Low resolution
- Memory intensive

Drive 4D Data with Puppets
- [HABLE14] - Next-Gen Characters: From Facial Scans to Facial Animation
- Researched but not used on in final Ryse pipeline
FACES

- FACS-based rigs
  - Scan reliant
    - art can deviate ~20%
- 260 Joints
- ~250 driven blendshapes
  - Keeps rig ‘on model’
  - ~85 firing at any given time
  - Up to 200,000 vtx deltas/frame computed
WAIT

260 joints and 250 shapes

CRYTEK, explain this shit

WHAT
Think ‘Multi-resolution’
- Facial ‘rig’ per hardware spec, not just distance
- Shared hierarchy differentiates ‘rig’ resolution

One rig to rule them all?
- Used nested hierarchies in layers
- All animations shared across characters
- Rig logic must drive all resolutions at once.
  - One anim set stores all resolutions
**LEVEL OF DETAIL (LOD)**

<table>
<thead>
<tr>
<th>Distance</th>
<th>Assets / Technologies</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 4m</td>
<td>CPU skinning, 8 inf, 260 joints, 230 blendshapes, tangent update, 5k tris across multiple meshes</td>
</tr>
<tr>
<td>4 - 7m</td>
<td>CPU skinning, 8 inf, 3 - 5k across multiple meshes with small face parts culled</td>
</tr>
<tr>
<td>7 - 10m</td>
<td>GPU skinning, 4 inf, 70 joints, 2k mesh with integrated eyes</td>
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<tr>
<td>10m+</td>
<td>GPU skinning, 4 inf, &lt;10 joints, &lt;1k mesh</td>
</tr>
<tr>
<td>Distance</td>
<td>Face parts</td>
</tr>
<tr>
<td>----------</td>
<td>-----------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>4m</td>
<td>Eyebrow meshes replaced, baked into facial texture</td>
</tr>
<tr>
<td>3m</td>
<td>Eyelash geometry culled</td>
</tr>
<tr>
<td>3m</td>
<td>Eye AO ‘overlay’ layer culled</td>
</tr>
<tr>
<td>4m</td>
<td>Eye balls removed, replaced with baked in eyes in head mesh</td>
</tr>
<tr>
<td>2m</td>
<td>Eye ‘water’ miniscus culled</td>
</tr>
<tr>
<td>3m</td>
<td>Eye tearduct culled</td>
</tr>
<tr>
<td>3m</td>
<td>Teeth swapped for built-in mesh</td>
</tr>
<tr>
<td>3m</td>
<td>Tongue swapped for built-in mesh</td>
</tr>
</tbody>
</table>
JOINTS

*UNLIT TEST ASSET*
CORRECTIVES
TANGENT UPDATE
FACIAL PERFORMANCES
EMOTIONAL INTENSITY [ORAC]
ORAC BTS
DON’T FORGET THE GAME

[MS COMBAT VIDEO]
THANK YOU.
THANK YOU.
SPECIAL THANKS!

TECHNICAL ART
Riham Toulan
Sascha Herfort
Harald Zlattinger
Alex Raab
Franco Bresciani

PROGRAMMING
Nicolas Schulz
Axel Gneiting
Bogdan Coroi
Ivo Herzeg
Andy Rayson

CHARACTER ART
Frederic Lierman
Lars Martinsson
Hanno Hagedorn
Florian Reschenhofer
Rock Lee Wang
Hyejin Moon
Chris Goodswin