Melton and Mustaches:
The Character Art and Shot Lighting Pipelines of The Order: 1886

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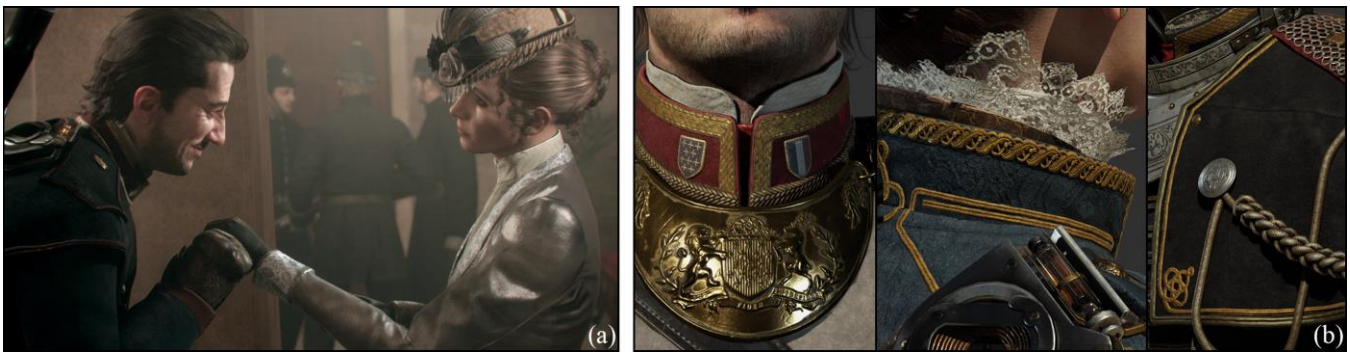

Figure 1: (a) Scene from The Order: 1886, (b) costume detailing and materials.

Abstract

The character art pipeline on The Order: 1886 was built to maximize the reuse of as much high quality, meticulously crafted content across as diverse a cast of characters as possible. Some of the methods put in place to achieve these goals included a hybrid head scanning and conceptual characterization process, textile 3d scanning a library of detailed, tiling materials to rapidly surface period accurate costumes, and efficient workflow techniques for styling, shading, and simulating diverse hair types. A film-style shot lighting system was also implemented for use in real-time cinematics, allowing performance optimized dynamic lighting that could be quickly custom tailored to each camera cut in the game.

1 Head Scanning and Characterization

Our character art pipeline leveraged the strengths of 3d facial scanning techniques, while still retaining artistic control to further characterize or stylize the heads as much as desired. The general hybrid characterization workflow went from one-sheet character write-ups directly to model casting and scanning for general proportions and facial structure. The scanned models would go back to the concept team to roughly alter proportions of the face to the desired structure in ZBrush, and then paint over the sculpts directly to further define skin coloration, hair, and tertiary details. From here the modeling team would refine the sculpt to production quality, leveraging shared uvs and topology to mix and match tertiary details from any other character model in the game.

2 Costume Detailing and Layering

Accurate clothing detail and shading was achieved through the combination of textile scan data, a secondary material layer for runtime tiling details, as well as a custom cloth shader. A massive catalogue of textiles were gathered, scanned, and converted to tileable materials that could then be composited together to create a final asset. These materials could also be utilized as a secondary input into a layered shader, tiling independently at runtime to retain high-resolution detail. Our material compositing system allowed multiple shading models to be layered into a single costume material and asset-specific textures could be further combined with tiling materials from our library, cutting down on production time and helping to maintain a consistent asset quality across characters.

3 Hair Groom and Shading

Hair creation and grooming relied on new approaches to established techniques. The hair pipeline was developed to allow for versatility, precise refinement, and a seamless blend between elements. Our approach to hair texturing involved rendering multiple passes of groomed hair primitives using an offline renderer, and then compositing the outputs for the final result. This process was repeated several times to create a library of sharable general use hair textures. Placement of hair geometry was a manual operation to ensure full artistic control and allow for numerous iterations. Transparency shading was used to ensure soft alpha falloff for hair transitions, and allowed for discrete hair geometry sorting which also improved authoring time. A custom hair material was also developed to broaden the features set of the basic anisotropic shader. Hair was simulated using proxy meshes to drive the hair geo based on movement and forces.

4 Real-Time Cinematic Lighting

Our cinematic sequences were lit with thousands of dynamic lights, using light sets sequenced on and off to a scripted timeline matching each camera cut. Our pipeline automated the setup and scripting of these shot light rigs and allowed lighters to make changes to character lighting in real-time, with live edits to lights within Maya updated instantaneously to the game, running on both PC and PlayStation 4 platforms. Light rigs could also be transferred between different shots and entirely different scenes on the fly, in addition to being stored as multiple 'takes' on each shot. This allowed for much faster and flexible iteration and refinement of individual shots, and sharing of template looks across entire scenes.

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