Creating the Looking Glass Mask on HBO's Watchmen

Farnia Fekri
Director of Marketing, Monsters Aliens Robots Zombies,
Toronto, ON Canada,
ffekri@monstersaliensrobotszombies.com

Nathaniel Larouche
Senior VFX Supervisor, Monsters Aliens Robots Zombies,
Toronto, ON Canada
nlarouche@monstersaliensrobotszombies.com

ABSTRACT

After having spent a year and a half working on the Looking Glass mask for HBO's celebrated *Watchmen* series, Monsters Aliens Robots Zombies Senior VFX Supervisor Nathaniel Larouche outlines how his team tackled the many 1) creative, 2) hardware and 3) software/pipeline challenges of creating the mask on a TV timeline and budget.

1 THE CONCEPT

We spoke with the overall VFX Supervisor of the *Watchmen* series, Erik Henry, early in the project's development, and he told us about a character that wears a mask known as the Looking Glass. The costuming department was having a hard time creating this specific piece; it was a reflective mask. They had tried a few materials, but it wasn't possible for them to create a mask that was mirror-like and could be comfortably worn by the actor.

From the script, we knew that there were scenes in the series where the reflections on the mask needed to be extremely clear. In the design phase, we created a few options—and it was the last design (which resembled a reflective fabric balaclava) that was closest to the world that the director, Damien Lindeloff, was painting.

1.1 The Hardware

We had about three months to prepare for the shoot of the pilot. During those months, we had to streamline the way in which the reflection footage would be captured onset. The challenge was the we weren't going to be given time by production, for them to take their cameras and shoot reflection footage for us. It would slow down the shoot too much. Capturing the reflection data was fully our responsibility.

We experimented with different cameras and different capture methods, and ended up designing a head rig that the actor could wear to capture the reflections needed to pull off the final effect. For all up-close shots, we had the actor wear a green mask and before each scene, we would place the camera rig on his head, and then shoot the scene along with all the reflections. It was pretty liberating for production—we stayed out of their way as much as we could, and let them block the shots as they wanted to. It was rare for us to have to have to step in and ask for a change for technical reasons. This also meant that throughout the shoot, the actor was wearing a mask, so he wasn't pretending to interact with the fabric...to him, it was natural.

In the three months of prep time before shooting the pilot, we did a lot of development work to create a 360-camera rig that was "set it and forget it," letting us hit record and make sure we were capturing everything that would be required for post. In our case, we had two 360 cameras that would be mounted on the front and back of the actor's head.
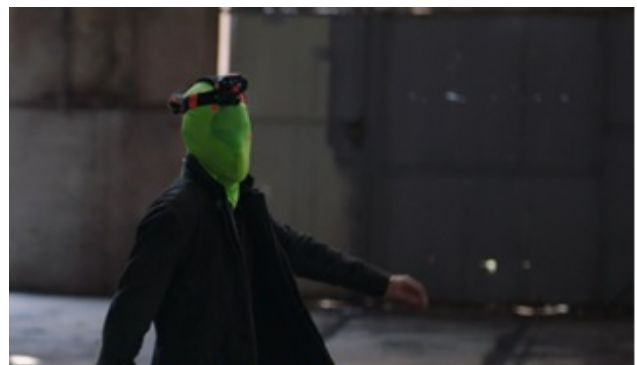
The mask and rig worn by the actor.

One of the biggest challenges we faced wasn't necessarily the quality or dynamic range of the video, but being able to stabilize it efficiently. We decided to use the RYLO camera. After the pilot shoot, we contacted RYLO to see if they would make changes to the firmware of the camera, mainly to allow us to remotely control the camera (there was an issue with the Bluetooth connection between the camera and the remote). We ended up creating our own remote, transmitter and receiver for the camera, creating a custom rig that allowed us to easily start and stop recording.

Final image of the mask during an interrogation.

1.2 The Software

To create the surface of the mask, we started with a pure chrome material that was a reflective surface, and then experimented with a lot of different fabric scans (denim, leather, or knitted yarn, etc). We noticed throughout the process that there wasn't one fabric that worked each time, because fabric tends to make a surface rough, and rough surfaces aren't reflective. Instead, we had to create a mask that had rougher parts and smoother parts. The parts of the mask that were pulled really tight (forehead, around his mouth and eyes) were very chrome like without much relief, while for parts that were looser (like seams around his head) we introduced displacement maps and weave patterns that were more rough. This combination gave the illusion of a more reflective material.

We used a lot of different software packages—it was a soup of software. For creating the asset, we used Marvelous Designer to generate the base structure and the geometry of the mask. That geometry was then brought into Z-brush (a sculpting application), where we then sculpted finer details and art directed folds and seams more easily. Once we had all of the folds and seams looking the way we wanted, we brought that geometry into Substance Painter (for texturing and shading, where we introduced damage and the chrome look). One really great advantage of this software is that you can simulate wear and tear based on time—let it rain on the mask for an hour and see what it looks like, versus five hours, etc.

We would then take that and bring that asset into Maya, which was our animation package. We had an animate-able version of the actor's face, and the mask would be simulated on top of this face. After that, the face was brought into Houdini, where we used a carbon cloth solver to simulate the mask on top of his face. Those simulations were then cached out, exported, and brought back into Maya to light. One of the last steps was to light and reflect all of the RYLO reflection footage back onto the simulated mask—we rendered this in Redshift, which allowed us to have fast turnarounds.

Most of the creative notes and feedback that we got was based on the position of the reflected elements in the mask, so we needed a quick way to art direct and position the reflections. Redshift was a key tool there—it allowed us to have fast iterations for the artists and supervisors. We then composited all of those layers together inside of Nuke.

The way the mask was treated in comp varied drastically depending on the environment of that shot. We gave compositors different passes with different roughness amounts—in very bright environments, the mask seems to read a lot smoother and chrome-like, while in dark lighting, the exact same mask would look more rough and dirty. We gave compositors multiple ID passes of rough texture maps, and they could apply their own grading to increase or decrease the roughness of the mask based on the sequence. A lot of that was dialed in the composites.

That's not even taking into account the environments, which were reflected into the mask. We stitched all of the onset photos together, and these spherical images were re-projected onto LIDAR data of all of the sets. These sets were then brought into our lighting department, using real 3D geometry, to reflect onto the mask. So the final result was a combination: we were reflecting LIDAR data and performances captured on the RYLO cameras together, plus the mask, to pull off the final effect.

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