Pacific Rim Uprising: Developing the Mega Kaiju Transformation

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Figure 1: A still from the film "Pacific Rim: Uprising," ©2018 Legendary and Universal Studios.

ABSTRACT

This talk will be center around an analysis of the evolution of creative and technical workflows in developing the Mega Kaiju transformation sequence. At its essence, the challenge of this sequence is about combining 3 creatures into a single enormous Kaiju. As the sequence was under developed at the previs level, DNEG was tasked with developing the look and narrative feel of the transformation during post-production. A very compressed schedule coupled with the technical complexities of merging creatures in a believable way, meant the team needed to lock down the vision of each individual shot while simultaneously developing pragmatic inter-departmental workflows.

CCS CONCEPTS

• **Computing methodologies** → **Computer graphics**;

KEYWORDS

Pacific Rim Uprising, Animation, Legendary, Mega Kaiju, FX, Shadow Puppetry

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1 INTRODUCTION

The Mega Kaiju Transformation sequence was one of the most complex series of CG shots in the film. We immediately departed from the overly simplistic previs by using mood boards drafted by our concept art department to reimagine the transformation process. These boards would first be constructed without considering things like camera angle and narrative structure. We needed to determine the "science" behind how thousands of Rippers, much smaller robotic drone creatures, would work together to sever different parts of the Kaiju anatomy like a creepy medical surgery, and then reassemble the limbs and different anatomical pieces into a kind of Frankenstein amalgam. Once completed, we then started to work towards story board construction, dividing the mood boards into sub-phases that elaborated on the individual story points necessary to convey the process of deconstructing the original three characters and rebuilding them into a single monstrous entity.

2 THE PREVIS

The previs worked against the post-production workflow in this case because it raised technical and story telling concerns we

couldn't address if we simply tried to do what the previs demonstrated. There were technical and artistic limitations with this envisioning of the process. In the previs, the Kaiju meshes are merged into each other like a sandwich of overlapping geometry and didn't resolve fundamental issues of how to actually break down components of multiple creatures and reconstruct them. From an artistic and story telling perspective, the previs reveled the mechanics in an overly literal see-everything kind of way. We wanted to avoid showing the viewer every little aspect of the process not only due to post-production schedule considerations, but also because director didn't want the audience to fully understand what is going on. There needed to be a sense of mystery and abstraction about the process until the final reveal of Mega Kaiju rising up through the smoke, much more enormous than any Kaiju we've ever seen.

3 MARRYING ANIMATION AND VFX

With a storyboard animatic demonstrating the flow of shots we needed in order to properly convey the transformation process, we then started to develop new previs, this time in Maya, with our DNEG animation team. Further changes and developments of shot angles and camera moves happened at this time. Using simple volumetric simulations, lights and shadows, we curated a higher fidelity playblast that would look better and help set the tone for all departments, rather than a mash up of geometry. At the same time, our FX team began the lengthy process of developing complex crowd simulations showing how the rippers swarm and locomote, as well as how they build long strands of ant-like constructions to reach the enormous rippers. Animation and FX worked closely together to create vast libraries of animation performances which would then be simulated by FX through Houdini.

4 BUILD AND CFX

As animation was progressing, our build and creatures teams started cutting up the limbs and other pieces of anatomy for each Kaiju. Instead of trying to dynamically cut the anatomy in each shot, we decided early on that it would be better to allow for the most amount of artistic iterations within our limited post production schedule by opting to simplify our technical approach. By providing a library of chopped up anatomy, the animation rigs for each limb could easily be transferred from shot to shot. With animation now working on pipeline friendly assets, they were able to focus the development of the shots towards story telling and put less burden on the back end departments. Muscle and simulation rigs could mostly be re-used from shot to shot. Our build team added detail to the insides of the geometry where the cuts occurred. We used a robust set of shotsculpt tools, allowing our build artists to art direct how the animation, muscle simulations and Rippers interacted. Our build team added contact details between Kaiju, fixed muscle deformations, as well as added dynamic wrinkles and muscle jiggle, thus creating an extra bit of life and movement in each shot.

5 SHADOW PUPPETRY

The concept of shadow puppetry was discussed at length when considering the look and feel of each shot. As this scene is a reveal of Mega Kaiju, it was important to keep the shots abstract and mysterious. To do this, our FX Team provided caustic gas simulations created by the rippers to our lighting and comp teams, which were then creatively placed to cloud portions of the action and add atmospheric depth to the environment. Using Clarisse to render and Nuke to Comp, the entire scene was given a ¾ end-of-day backlighting treatment, shadowing the movement of the different Kaiju behind the smoke and creating a strong sense of motion without needing to see the finite details.

Figure 2: A still from the film "Pacific Rim: Uprising," ©2018 Legendary and Universal Studios.

Figure 3: A still from the film "Pacific Rim: Uprising," ©2018 Legendary and Universal Studios.