Bringing Lou To Life

A Study In Creating Lou

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ABSTRACT

In Pixar's Lou, a combination of lost and found items comes to life, multiple pieces assembling to create the eponymous character. There were many visual and technical challenges to creating a character that can take on almost any form, using many of the random objects around him to convey emotion and feeling. We've highlighted several of the ways animation, modeling, rigging, simulation, and shading worked in conjunction to develop artistic and technical solutions to make Lou feel as real as the world around him.

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CCS CONCEPTS

• **Applied computing** → *Arts and humanities*;

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1 ANIMATING PERSONALITY INTO A HOODIE

Animating Lou presented a number of challenges as we had to show a believable level of strength in him (to outrun the bully) and at the same time maintain the pliability of being made of cloth. Much of his final appearance came from taking the design that Art created

Figure 1: Lou's facial flexibility.

Figure 2: Shading the Softball.

and drawing it out in a variety of poses. Then attempting to hit the look of those poses with the animation rig. This work flow kept a steady cycle of information going between animation, rigging and simulation as we were constantly evaluating and re-evaluating the needs for our character. Custom rig solutions were created in order to hit some of these drawings. Animation also contributed to the exploration of Lou's re-design in a effort to push the boundaries of how different Lou could be from shot to shot.

Due to the nature of Lou being made of cloth, he does not have bones and would collapse into himself without his toys to hold him up. His head was essentially his mouth, so every change in expression altered his overall head silhouette considerably. The eyes and brow could separate from his 'head,' but always served as a home base for the audience to anchor Lou's face as he went through multiple configurations. Tiny details like the stitching on Lou's eye's and button holes were used to enhance his various expressions.

Animators not only had to manage the complex controls of Lou's hoodie, but also the 12 plus props that filled out the rest of him. While we would have loved for a catch all rig to automate their movements, there was no way to predict what configurations he would be going through in any given shot. Animators had to plan extensively with the director and then set up their own prop hierarchies on a per shot basis.

2 RIGGING AN UNBREAKABLE LOU

Rigging Lou required us to go beyond the traditional rigs to create something brand new to be able to match the needs of animation and give incredible flexibility to each part. Every rig control was independent of the other, requiring a complex series of constraints that could both work together, but also function separately through a series of animated splines whose parents could be switched. The knot spline rig was adapted for the special needs of Lou, giving a rhythmic flow to the way the controls work and keeping the silhouette smooth. The Delta Mush, in conjunction with an Edgekeeper deformer, created a relaxing effect on the geometry to make sure it always remained smooth, and yet maintain its distinctive edges. While the names of the animation controls were kept the same, under the hood, almost everything was switched out for custom deformers unique to Lou. This would allow animators to be familiar with the controls and at the same time, adapt to the new functionality which gave both macro and micro styled controls to mold Lou with unique shapes that gave him his personality. The baseball eyes themselves would not deform, nor would the button pupils, so all of the expressions would come either from the sock brows, the direction of the baseball stitches, and the way the baseballs would interact with the hoodie mesh. This meant a malleable setup with collisions that could be sculpted into the necessary expressions and give animation the freedom to mold any part into what they needed for the performance.

3 SIMULATING PERSONALITY INTO CLOTH

Simulation of Lou's hoodie geometry often drastically changed the silhouette, detail, and animation of the rigged model used by the animators. Because of this, a traditional, linear pipeline where simulation is added after animation finishes was not ideal. Instead, simulation artists worked alongside of the animators to dial in the look and feel of Lou, helping inform the desired performance. Traditional cloth models rely heavily on collisions with the body geometry to drive the movement and shapes of the cloth. Because Lou doesn't have a body to collide against, a weighted set of kinematic springs were used to track the simulated cloth points to the rigged model. Detailed weighting of these springs allowed the cloth to track heavily to the animation near the face and hands, while leaving the bodice, neck, and arms more loose and cloth-like. New simulation tools were also used to dynamically add and remove cloth when animation squashed or stretched Lou's face and body. This setup allowed us to easily dial in the amount of wrinkles and folds in various regions of the hoodie. Finally, a set of tools were developed that allowed animators to adjust the simulation results as a post-process, while still maintaining all of the physicality and secondary motion that the simulator added to the character's performance.

4 SHADES OF LOU

Since Lou is mostly a conglomeration of props and because modeling, rigging and shading were working on top of each other, we handled his shading differently than most characters in the Pixar pipeline. Each part making up Lou's body was painted and developed as highly detailed prop with it's own unique level of aging at first, not knowing what angles or positions they would end up being seen in as Lou moved. As we got poses, more work went into relating each object's colors and textures to get his jumbled appeal right.