This sketch introduces a new tool that allows animators to position sets of controls with stroke of a mouse. SketchPose works well with pen-based input devices and provides an artists interface for posing complex rig intuitively.

1. **Overview**

In 3D animation, character performances are becoming more complex, as are the controls necessary to manipulate a computer character. Manipulating dozens of controls in a character can be a disconcerting, and time consuming task. Many animators are used to being able to pick up a pencil and quickly sketching out the poses needed in a scene. An artist based interface allows the animator to focus on the performance of the character, not the technical details of how the character is controlled.

SketchPose assists the animator by letting the artist sketch the general shape directly in the camera view. The animator doesn't need to know how to manipulate each control to create the pose. It becomes the tool’s responsibility to figure out how to manipulate the rig in order to achieve that pose.

Figure 1. A complex rig that works well with SketchPose because of the many controls in the tentacles. All images © The Walt Disney Co.

2. **Applications**

SketchPose has become an important part of the animator’s toolbox. It has proven its worth many times, especially with complex characters such as the alien creature shown above. Manipulating the dozen controls for each tentacle would have been a very time consuming task without SketchPose. Using SketchPose, the animator can draw out the shape of each tentacle without having to position individual controls. This gives the animator a cleaner pose more quickly than would otherwise be possible.

Another important application of SketchPose has been in grooming long hair. Hair requires many controls to achieve a particular style. SketchPose allows the artist to quickly groom the hair by focusing on the shapes they want to achieve. Grooming hair has shown that SketchPose has applications other than animation. The tool has proven valuable in cases where many controls need to be manipulated in an artistic manner.

3. **Design Details**

There are several pieces of information that are necessary for the tool to work in an intuitive way. First, it needs to know what controls to position. This is done by looking at the current selection list. Controls are positioned in order of their selection.

SketchPose then determines what pixels of the sketched curve should be used to position a selected control. The most commonly used method of doing this is curve-length sampling. With this method, the sketch samples are determined by positioning the controls along the entire length of the sketch curve after the sketch has been drawn. The distances between the controls is taken into consideration so that they maintain their relative distances along the length of the curve.

Another method is control-distance sampling. As the artist sketches a curve, the pixels are projected into world space. The first control is moved to the first pixels world-space position. The second control looks at the second pixels world-space position. If the new position is too close to the previous control to maintain the distance between the controls, the next drawn pixel is projected. If that pixel is too far to maintain the distance, then somewhere in between is a position that will maintain the distance.

To find the world-space position of a sketch pixel, it is projected through the camera plane. Each control is considered to lie on a plane parallel to the camera. Where the sketch sample projection intersects this plane is the new position for the control. This allows the artist to draw on any orthographic or perspective camera view and isolate the positioning of controls to specific axes.

4. **Conclusion**

At Disney, we believe tools should be designed to allow artists to express themselves in an unconstrained manner. SketchPose is an example of how much an animator can be empowered by a new way of interacting with the characters they bring to life.

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