## Wanna be a 3D Animator?

Good 3D animators are the most highly sought-after artist in the world of 3D. There's a reason for this: good animation is hard. Which is not to say that animation is hard to learn, but rather that making animation that is believable and entertaining requires a lot of skill and practice. Most people who become 3D artists rarely venture beyond modeling, and their forays into animation are inexpert at best, and cringe-worthy or unwatchable at worst.

This is because animation requires a completely different skillset than 3D modeling. In fact, these two aspects of 3D art are so different that 3D modelers are rarely animators, and animators can rarely model. Established studios usually hire dedicated animators to do the bulk of the animation. Modelers, if they have any input into the animation process at all, usually stick with rigging.

What you should take away is not that it's impossible to be a good modeler and animator, but that these two subsets of 3D art require different ways of thinking and usually do not share techniques.

**The Basics of 3D Animation**
Animation in 3D applications usually happens in two primary ways. In major productions, both may be used.

**1. Keyframe animation** - Keyframe animation, or keyframing, is the most well-known and oldest style of animation. In fact, there are examples of frame-by-frame animation dating all the way back to 1600 B.C. Egypt! Modern keyframing techniques date back to the early cartoons created by animation pioneers like Winsor McCay and Walt Disney. What may surprise you is that keyframing

techniques have not changed much since the early 1900's - most of the basic principles still apply today. What has changed is that 3D software packages have made keyframing much easier to accomplish, meaning a broader scope of artists can learn how to animate.

Keyframing is essentially changing the shape, position, spacing, or timing of an object in successive frames, with major changes to the object being the key frames. In traditional 2D animation, each frame is usually drawn by hand. When frames are shown in succession, as in a movie, the slight differences in each frame of animation create the illusion of motion. 3D software packages make keyframe animation easier by interpolating, or "tweening," the in-between frames. When animating a falling ball, for example, one key frame might be of the ball in mid-air, the next key frame may be the ball touching the ground, and the key frame after that would be the ball squishing down as the impact deforms its shape. All of the in-between frames are then calculated by the software automatically, including the squish at the bottom, making actual process of animation a matter of creating a few great key frames.

**2. Motion capture** - Motion capture, or mocap, was first used sparingly due to the limitations of the technology, but is seeing increased acceptance in everything from video game animation to CG effects in movies as the technique matures. Whereas keyframing is a precise, but slow animation method, motion capture offers an immediacy not found in traditional animation techniques. Mocap subjects, usually actors, are placed in a special suit containing sensors that record the motion of their limbs as they move. The data is then linked to the rig of a 3D character and translated into animation by the 3D software.

There are a couple downsides to motion capture which make it difficult for beginning 3D animators to learn. Firstly is the cost of mocap technology, which can run several thousands or even tens of thousands of dollars. This means that most new 3D artists must learn to incorporate this animation style by importing mocap data into a project from a commercially available mocap library.

The other downside to mocap is that the end-result is often far from perfect; mocap animation usually requires clean-up from keyframe artists to make it look more realistic, especially if the character being animated does not have an anatomy or proportions similar to those of a human.

**Learning 3D Animation**
Animators must have a keen understanding of motion, movement, and acting. It may surprise you that the best animators take acting lessons - this helps them understand how their own body moves, and makes it easier to transfer that understanding into believable animation.

Keen observation may be the most important skill to develop as an animator.

Observe life around you, and how things move. Make sketches, take notes, and try to give meaning to what you observe. Don't study just animation. Learn from film, theatre, and even comic books to understand how poses and movement create moods and nonverbally communicate messages. New animators would do well to learn from the old masters of 20th century animation - Walt Disney, Art Babbitt, Grim Natwick, and Ken Anderson. The principles used to bring characters like Mickey Mouse and Bugs Bunny to life are still as relevant today as they were back then. Indeed, the first place a new 3D animator should look is to the old animation manuals of 2D artists. Consider picking up "The Animator's Survival Kit" by Richard Williams from your local book dealer. While written as a book about hand-drawn animation, it contains everything you'll need to know about good animation techniques in the 3D world.

The beginning 3D animator will want to focus on basic objects first: how to make a ball move from one place to another, and how to make it bounce. Later, as you explore character animation, you'll need to understand what makes a good walk cycle, and how to cut down on "float," a common problem for new animators where the character moves as if underwater. The software used is not important, at least in the beginning, as animation packages all have the same basic features.

3D animators must also have a good grasp of how models are rigged for animation, especially character animators. The "bones" used in a rig must be placed in a way similar to that of a living creature. Animators must also learn how to use inverse kinematic (IK) setups for their character rigs to reduce the amount of time spent keyframing.

Above all else, animators must practice their craft. Like modeling, animation requires time to learn, and even more time to master. Even experienced animators may create dozens, or even hundreds of test movies before getting a good final result. A good animator can make an average model come to life, while even the best model can be made to look amateurish by a poor animator. Persistence will pay off, as a skilled animator can very well be the most important team member to a production.

Introduction to 3D Animation
http://www.animationarena.com/introduction-to-3d-animation.html