Information Sheet

Basic Principles of Traditional Animation

These basic principles of traditional character animation derive from work done at the Walt Disney Studio during the 1930’s. The studio conducted drawing classes for its animators at the Chouinard Art Institute in Los Angeles. They also studied live action films and mathematical models of motion. Over the course of many productions during a decade, these basic principles emerged for producing highly natural animated character movement. I leave out “Appeal” and “Personality” as they are obvious and more like aesthetic and content goals than design principles.

Staging

Perhaps the most global in importance, staging refers to how the content is presented, from what viewpoint is it seen by the viewer. Staging is critical to presenting the action so it is clear and effective. A funny walk may be only funny when seen from a particular viewpoint. Facial expression may be more complex and interesting when seen from a 3/4 view rather than only the front or only in profile. That’s because we can see the head as more of a three-dimensional object that way and the view will carry information from both the front and side.

Timing

Timing means the spacing of actions in time to communicate the weight and six of objects and the personality of characters. A heavy object has a harder time getting going and then is harder to stop. A lighter object can move more quickly and crisply. A sober character’s movement will have completely different timing than that of a drunken character.

Exaggeration

Exaggeration is also global in importance because how much or little it is implemented determines a lot about its timing and flavor. The more exaggerated the more “cartoony” (Road Runner), the less exaggerated the more “realistic” (Final Fantasy). What is being exaggerated can range from the character shapes to physics (Road Runner), facial expression, gesture, and timing of characterization. Most live arts performances (music, dance, and plays) have creative exaggeration but instead use terms like “expression”, “theatricality”, “drama”, and “passion”. Typically, what we want from the arts is more than realism and without well-tuned exaggeration, animation has a way of looking stiff, lifeless, and unnatural.

Anticipation

It takes the human visual perception system time to make out what it is seeing, so an anticipation is some movement or expression which prepares the viewer to actually see the motion which follows and follow the thread of the action. The general rule of thumb is that the faster the...
motion, the bigger or more exaggerated the anticipation should be. Sometimes the anticipation is a movement in the opposite direction, e.g. as when a character leaps into action and runs off. Sometimes it is a subtler cue that the character is about to do something, like seeing the character have an idea or experience an emotion.

**Follow Through**

Follow through is at the other end of a movement from anticipation and is the movement or action that is the result of (usually in terms of physics and momentum) another movement or action. For instance, when a running character stops, it may bend forward a bit and then wobble back and forth as the forward momentum carries the body beyond the stopping point. The arms may rotate forward before coming to rest. Follow through is generally seen in extremities which keep on moving and only stop a bit after the body to which they are attached stops. In articulated figures or mechanisms, this is related to overlapping motion.

**Overlapping Motion**

Having all components of your animated characters and objects move on the same key frames makes for robotic movement. Try walking around with all your limbs rotating in unison. For a more lifelike effect, we overlap the various movements in time. For instance as you walk your upper arm swings forward and back. The lower arm lags behind a bit at the start and then keeps moving after the upper arm has stopped. The hand lags behind the lower arm and continues to move after it has stopped. These three movements are overlapped. Note that HOLDS are important in making overlapping motion work.

**Secondary Action**

Secondary actions are those which result from primary actions. They play a key role in creating complexity and richness. A pony tail moving may accentuate the movement of a character's head. Facial expression may be secondary to body motion but convey additional information.

**Squash and Stretch**

Squash and stretch are used to imitate the look of physical forces acting upon objects. These physical forces include gravity, momentum, inertia, impact and collision. Objects squash when they impact other objects and they stretch when they are moving quickly through space.

**Ease In/Ease Out**

Objects in the real world don't often move in a strictly linear fashion where all speed is constant. Instead, they are still, they gradually get moving, get up to speed and then either they crash into something and
Information Sheet

explode or they calmly slow down again before stopping. We mimic this in animation using Ease In (ease into a move) and Ease Out (ease out of a move). This is also known as Slow In and Slow Out. Ease In/Ease Out calls attention to the critical parts of movement from a narrative standpoint, i.e. getting going and stopping. Because speed varies, it has a more natural and less mechanical look.

Arcs

Describing the visual path of action from one extreme to another by an arc, making animated motion more smooth and less stiff than a straight line for the path of action. Objects falling straight down are an exception. To experience the difference that arcs make, try moving your hand in big sweeping gestures. Then do the same but follow straight lines between the extremes.