Animation principles, production, and references

Key frame animation

The word "keyframe" comes from the early days of keyframe animation, when each frame was drawn by hand, which was a very time-consuming and challenging task. (<https://www.svgator.com/blog/what-are-keyframe-animations/>) since then, key framing in animation has developed a lot to the point where now only the keyframes must be animated and the software handles rendering the frames in between. Key frame animation defines the starting and/or ending point of any smooth transition. That something can be a drawing in animation or a particular frame of a shot when dealing with film or video(<https://www.studiobinder.com/blog/what-are-keyframes-in-animation/>). It is the process of manually moving and rotating controllers in order to make a mesh move in a certain way that the animator is in control of, this can be controlled in ways such as the speed of the transition is determined by the distance between the two keyframes in the timeline. A longer distance will mean a slower speed for the element to get from (A) to (B) (<https://www.svgator.com/blog/what-are-keyframe-animations/> ). One of the better ways to do this is to create a video in real life. After it has been made it can be used to get some select frames throughout the video, these single frames can then be used to make a sketch over it. By doing this you get the exact positions of where things should be at each frame, this makes the animation realistic since the exact speed of movement and place of movement are maintained in the animation. The main advantages to using keyframe animation; they speed up the animation process, they let animators create any kind of movement with ease, they create smooth transitions, makes later changes easy to make (<https://www.svgator.com/blog/what-are-keyframe-animations/> ).

This has some negatives attached to it some of these are; it can be time consuming to manually set up and adjust key frames and complex movements can be difficult to create (<https://www.svgator.com/blog/what-are-keyframe-animations/> ). whilst it is good for creating movements it can be difficult to create realistic, smooth, and fluid animations especially when creating animations for traditional living creatures such as people and animals, although it can be done despite being time consuming. It can be Particularly difficult to animate in a consistent quality and accuracy, difficult animations tend to be complex and dynamic such as running, jumping or fighting (<https://www.linkedin.com/advice/1/what-pros-cons-keyframe-animation-motion-capture> ) another issue that can arise from keyframe animations in games is that It is tied to specific frames, this can cause issues in games because of the variety in frame rates and the power of the machine running the game because the animations are frame rate dependent if the FPS drops in the game it could cause issues in the animations. (<https://steamcommunity.com/app/374320/discussions/0/357286663671698771/> )

This can be the cheapest form of animation in game development as it can all be done within the modeling software; it requires no outside tools or hardware. The main costs in relation to this method of animation is the cost of the employee animating the model and the licenses costs of the software being used. This helps to keep the development costs down, however with more complicated animations that take longer, the cost of the development could end up being higher than other forms of animation.

Motion capture

Motion capture is the process of placing cameras with infrared LEDs around an area containing an object, person or animal wearing reflective markers (<https://www.bbc.co.uk/news/science-environment-34175225> ) this helps to create much more fluid animations for living creatures. Films such as *War Horse* or *Life of Pi* use computer-generated animation to portray difficult scenes involving animal characters, but this is expensive and often produces “stiff and unrealistic” animals' movements, Mr. Abson said. Motion capture, however, is a way of building up a computer-generated image but based on the real movement or actors or animals that are filmed simultaneously in infra-red light by several cameras positioned around the characters. (<https://www.independent.co.uk/tech/motion-capture-technology-to-end-stiff-and-unrealistic-onscreen-animals-10490261.html> ). this helps to stop the player feeling like the animations are uncanny and strange since they are the real movements of an animal

There are some negatives attached to the process of motion capture animation one main one is that due to it capturing real life movements it is difficult to create unique and creative animations, due to it being someone in a suit it depends on many factors, such as the acting abilities of the person or animal in the suit, the software being used and the equipment being used (<https://www.linkedin.com/advice/1/what-pros-cons-keyframe-animation-motion-capture> ) using animals to create movements can also be very unreliable as they are animals and it can be hard to get an animal do the exact movement you are looking for. It can also be difficult to animate inhuman models since they capture movement. If you are animating a model, it can be hard unless you use the actual animal, however this brings up other concerns. Depending on the animal it could mean health and safety risks or expensive trained animals. For creatures that do not exist in real life such as my Venus fly trap model, you cannot motion capture it easily as the skeleton is nothing like a human making the creation of movements much harder. For smaller teams it can end up costing more in terms of the software and equipment (<https://animost.com/ideas-inspirations/pros-and-cons-of-motion-capture-the-development-of-motion-capture-asia/> )