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The flying mechanics of dragons: A new approach in character design through the use of anatomical constraints in the conception of organic creatures

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Making computer-generated animals and fantastic creatures are one of the most difficult tasks in animation and visual effects production. The hardest part is to animate them in a realistic way that lets the spectator focus on the story rather than what may seem like visual gimmicks. However, it is a common trend for the animation of these characters to be choppy or lacking in motion, leaving the viewer to see implausible scenes like winged creatures floating in midair without performing any sort of flying movement. When regarding a real animal, the problem with these unnatural animations can be fixed through more careful observation of the creatures by the animators. Regarding fantastic creatures or heavily modified animals, the issue is more complex because their human-designed anatomy tends to hinder movement, preventing the animation from being fluid. The cause for this lies in the creation process, as creatures are designed from the outside in, making movement and motion mechanics afterthoughts instead of core design issues. Here the author proposes that by designing character anatomy first and basing it on the characters required performance, modelers can ensure more realistic onscreen representations. The author will present these principles as applied to a flying dragon, which despite being a common creature in movies, usually lacks the realistic flight movement that we see in birds and bats. Focusing on the wings, the author has included a floating scapula as a point to attach the wing. This allows the complete flying mechanics of either a bat or a bird while maintaining a surface area, which is a key in order to generate lift and create a good look on screen. This process also has the advantage of simplifying rigging, as there is no need to compensate for volume deformations that occur during extreme posing, as well as being adaptable to multiple types of productions.

Biography

Jorge Sánchez is a Visual Artist who completed his MFA in Animation and Visual Effects at the Academy of Art University in San Francisco, California. He is currently a Full-Time Professor in the Animation Program at the Universidad de Monterrey in Mexico. He has worked as a modeler for videogames, animation for television, and 3D animation in new areas such as theater productions. His research focuses mainly on modeling of both organic and hard surface projects.

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