Crafting Expressive, Non-Humanoid Alien Characters

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This paper presents the challenges and innovations behind rigging non-humanoid alien characters with unconventional anatomies—such as limbless, multi-segmented, or fluid forms. Using collaborative workflows, modular rigs, and procedural tools, the team enabled expressive, efficient animation while balancing creative ambition with technical scalability.

1 Introduction

To meet the production schedule of Pixar's *Elio* (2025), our artists developed unique rigs and topologies for each alien's distinct physiology. The Characters and Animation teams collaborated early through brainstorming sessions to map out the approach for these non-earth beings. Quick previs models in Maya and ZBrush, built from simple shapes with smart shading, streamlined approvals and accelerated the design process. To accommodate various articulation styles, we built our rigs using custom deformers and controls available in Presto's rigging toolkit, including AutoSplines [Hessler and Talbot 2016], CurveNets [de Goes et al. 2022; Nguyen et al. 2023], and tooth-sliding mouth [Speirs et al. 2024]. as we detail next.

2 Alien Case Studies and Technical Innovations

Reminiscent of marine flatworms, *Ambassador Questa*'s design required a unique rigging approach to capture her expressive form, particularly her complex blanket wings. To achieve full control, we built a hierarchical system starting with standard IK/FK controllers, which drive phantom limbs that manipulate an AutoSpline fitted around the blanket. This spline then drives a matching 2D CurveNet. Using the Profile Mover, we applied the CurveNet's deltas to deform the blanket mesh, producing convincing cloth-like motion. To push the system further, we parametrized the CurveNet's perimeter and applied an animatable sine wave with a smooth inward falloff. These sine wave patterns were crucial to creating the flowing silhouette that defines Questa's movement.
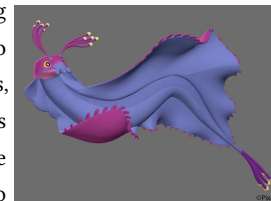
For our caterpillar-like Hylurgians, *Grigon and Glordon*, the challenge was creating a multi-limbed larva with a massive, tooth-filled mouth. Unlike Questa's snake-like form, Glordon required more precise CurveNet deformations along his body. To this end, we combined two torso rigs for nine central joints, offering detailed pose space control, with an additional 5-knot AutoSpline to drive the skeleton, giving animators the flexibility needed for Glordon's acrobatic movements. Like the torso, the appendages used a hybrid skeletal/AutoSpline rig, blending curve-based motion with the corrective sculpting control of a skeletal system. Each of Glordon's multiple rows of teeth, without clear upper/lower separation, was rigged using closed curves. Global controls managed sliding and rotation, while parameterized regional controls allowed for fine-tuning in extreme poses. Individual modular rigs were instanced for animators to control each tooth.

Ambassador Helix's round, organic design relies on squash, stretch, and twisting to convey charm and appeal. His four arms needed to slide naturally around his torso while adapting to its deformations. We used CurveNet to deform both body and face. Custom rig controls—including rocker, belly cinch, multiple leg setups for the lower body, floating brows, and real-time surface relaxation—further enhanced his flexibility and expressiveness.
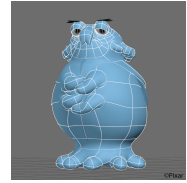
Ambassador Corvus is a tube-like character with a long neck, torso, and legs, and a cluster of eyes that interact and touch. To keep their movement natural yet controllable, we used a CurveNet to deform the eyes as a group while allowing individual adjustments. This maintained an organic feel, especially when the eyes shifted or spit out during communication. Additional controls enabled fine-tuned posing while preserving fluid, expressive motion.

Ambassador Auva expressed itself through ink-like patterns on its face. To achieve a merging water-droplet effect, we adapted metaball tech from another rig for the film (OOOOO). These were projected onto the face as a texture, giving animators real-time control and immediate viewport feedback without relying on post-render processing.

As initial alien passes were completed, the team was tasked with adding more visual variety without increasing rigging costs. Thanks to modular rigs, new designs were quickly generated. For example, *Ambassador Weezen* was derived from the larger *Aquarii* species by scaling down the body, tweaking shading, swapping eye parts, and adding winged ears—achieving a distinct look with minimal effort.

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