The spirit of Rango : dissection of character animation and rigging

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1. Introduction

Rango was Industrial Light and Magic first animated movie and presented challenges in many ways. The number of characters, their realism and complexity, the unique stylized look, had probably never been achieved before in an animated feature. We will give a broad presentation of the workflow and tools that were used for rigging and animating the characters of the movie Rango.

2. Rigging

The characters in Rango were very diverse and presented a high level of complexity : an over-expressive chameleon, a feathered hawk, a huge snake, freaky characters, most with hairs, snouts, ears... They were all there in Rango, with various sets of costumes and accessories.

One of the challenge on Rango for creating creature assets was finding new and innovative ways to build more assets in a shorter period of time. We were provided 2D concept artwork for each character, and created quick 3D maquettes to get approval for the design, before building the final model, that could be pass to the rigging department.

Block party, our procedural rigging system was pushed to build and maintain these hundreds of characters, with different costumes and multi-resolution assets. Each of the rig was quite unique and required some new "blocks" (which are an individual piece of a rig that can be re-used in other characters), or the addition of new options to the existing blocks.

The rigs were using several in-house plugins for volume preservation, for efficient constraining of a multitude of objects to geometry, and for facial animation.

The movie had an important number of hero characters, and we had to extend our facial system to scale as efficiently as possible to these numbers.
Rango, the main character, presented an important challenge for facial animation. His expressiveness, the size of his mouth and eyes would make it limiting to only use traditional blend shapes, for a fine animation.
We developed a system that allowed the animators to modify precisely the facial animation, after a first pass of blend shape animation was applied. The exact shape of the mouth and eyes could be adjusted with precision, without being limited by shapes, and allowing the animator to be as creative as possible.

Hairs, feathers and flakes were some other important challenges that we had to address in a new way for this movie. The characters had a variety of very stylized hairs, that were to match the 3D maquette that was built.

Each asset had its specific UI that was built with an internal tool, and was connecting to the various controllers of the rig, to be used by the animator to increase his productivity and leave more space for creativity.

Figure 1. Rango, the main character.

3. Animation

A lot of time and energy was spent in pre-production to prepare the libraries of poses for body and facial animation. For the facial, the list of actions and conventions were standardized. We leveraged our animation tools suite to improve the productivity to create these poses, manage them and share them between animators.
We had internal tools to build body poses, facial poses, and other tools to apply and animate these poses.

We will also describe the various steps that the animator went through : Incorporating the script, story boards, layout and performance reference, to create the final animation.

4. Conclusion

Rango brought new challenges to the Industrial Light and Magic crew. It took around 2 years to create this special movie for more than 1500 shots, and hundreds of creatures and pushed Industrial Light and Magic rigging and animation pipeline and workflow in all directions.