1 Introduction

CG creature work is a field in which the bar never stops rising, and the challenge faced by Framestore when creating their iteration of the magnificent lion Aslan for 'The Chronicles of Narnia: Prince Caspian', was to ensure that he was purer, bolder than ever, and able to interact closely with the cast to a degree previously unseen. Whilst we were able to draw on our previous CG fur experience and proprietary grooming tools, we soon realised that creating the lion's mane would require extraordinary effort and ingenuity. In particular, controlling the shape, movement and interaction of light within clumps of hair required a whole new approach including a density-based normal calculation and voxelised occlusion. Trufflehunter the badger – a new major character to this film – required a great deal of interaction with actors and props in the scene, thus creating his own set of development issues.

We present the process of creating the creatures Aslan and Trufflehunter from concept through to final composite, with emphasis on the techniques we developed to generate, simulate and render large volumes of photo-realistic hair.

2 Groom Development

Despite reprising his role in Narnia, we were largely developing Aslan from scratch. Framestore's HairFilters grooming system (previously used for the polar bears in 'The Golden Compass') was pushed to a new level to cope with the volume of hair and tight clump control required for the lion's mane. Using our high-level fine, clumping (aka flumping) controls we were able to groom the mane around a relatively small number of guide hairs – around 2550 compared to the 10,000+ used in the first film. We also deliberately divided the groom for the mane into separate fur descriptions. This gave us more practical version control and allowed our Grooming Department to work on individual descriptions in parallel. Overall, 15 fur descriptions were used to generate the 7.6 million hairs comprising the mane.

With fine face fur, a coarse belly and shaggy shell, Trufflehunter benefited from the same techniques, by using separate fur descriptions for the specific hair qualities. As a new character, we captured a lot of reference material first-hand which became extremely useful for look development and animation as the traditionally reclusive animals are rarely captured in sufficient detail on film.

3 Hair Dynamics

Dynamo, another proprietary tool, was used to simulate our hair movement ranging from a gentle breeze, a hand running through a mane to the badger being carried through a forest on the shoulder of a Prince. We solved on the underlying guide hairs and also had the ability to tweak using a poly-shell for tuning at the lighting level.

Wind simulation was handled by pre-calculating vector grids representing wind strength which were then plugged into Dynamo. Wind occlusion was handled using a fast lookup of a voxel representation of the characters. Fur dynamics inevitably required some hand tweaking, but by the end of production results were predictable and controllable.

4 Fur Rendering

With Aslan’s flowing mane and Trufflehunter’s dense coat, a shading model which accurately produced the result of light interaction through hair was essential. Finding a stable normal for use in our Marschner-based [Marschner et al. 2003] implementation became a particular problem. Fixing the follicle orientation allowed us to approximate the effects of light through individual, elliptical animal hairs, but conforming the normal directions to provide a sufficient ‘shell’ for lighting our thick hair clumps required a new technique. We ultimately came up with a voxelisation method for generating clump normals using fur density as a guide. The same technique also allowed us to produce high-quality fur-to-fur occlusion and environmental lighting in a fraction of the time taken by other methods.


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