

An Abstract Journey

Production Focus on the 'Abstract Thought' sequence in Pixar's 'Inside Out'

Evan Bonifacio Sarah Fowler Deluna Masha Ellsworth* Bernhard Haux† Jonas Jarvers
Vladimir Kooperman Ken Lao Colin Levy Albert Lozano‡ Sajan Skaria Ron Zorman



Figure 1: Stages of abstraction in the sequence *Abstract Thought* ©Disney/Pixar. All rights reserved.

Abstract

In the *Abstract Thought* sequence of Pixar's *Inside Out* the characters find themselves in a specific part of Riley's brain that processes abstract notions. They go through various stages of transformation towards abstraction as they try to find their way out.

A very particular art direction, which was different from the overall look of *Inside Out*, required a small team of artists to work very closely together in order to keep communication lines short and workflows flexible. All departments had to react to changes promptly, bringing rough, new ideas from story to screen as quickly as possible in order to be evaluated in context.

1 Story, Art Direction and Layout

In *Abstract Thought's* development, story and art direction were deeply intertwined. The characters deconstruct from their natural form progressively into a cubist, a two dimensional, a non-figurative, and a linear version of themselves. These transformations had to be in harmony with the requirements and rhythm of the story and the style of animation.

For Layout, the sequence was about deconstruction; a collapsing of dimensions. Various conceptual and technical approaches were explored to handle the particular transitions in the scene, mainly by using scales, choosing different types of lenses, as well as taking advantage of visual tricks with camera projection. More technical questions and challenges emerged for the 2D portion of the sequence. The tools and pipeline had to be adjusted and the setup had to work with both Editorial and Animation for the right shot flow and timing of the performance.

*e-mail:masha@pixar.com

†e-mail:bernhard.haux@gmail.com

‡e-mail:albert@pixar.com

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2 Characters and Animation

With unconventional character designs, animation required rigs that were flexible in their ability to be taken apart and put back together into new formations. Most of the character parts were therefore built as individual models. Many of the 2D shaped geometries were set up with deformation controls to allow individual shaping in animation. To ensure the representation of changing abstract mouth shapes, different versions were contained within the same model and swapped out by the animator.

Animation faced the challenge of developing a style of motion that fit into the world of the already defined mind characters yet remain unique unto itself for the sequence to stand out as different. The 2D animation was achieved with rigged shapes which could then receive a layer of sculpting for further refinement. When the animation required unique shapes, there were several configurable rigs which helped to achieve the desired forms. Having a quick rendered version available for animation was necessary to be able to check elements that would get projected onto others during the rendering process.

3 Shading and Lighting

To emphasize the transformation of the mind characters the surface qualities of their skin and garments had to become more simple while still being recognizable. Shading TDs worked closely with the art department to identify textures and materials that would be suitable for the task and provide balance between simplicity and visual interest. A variety of shading techniques were used to achieve this balance such as: using bump to fake depth on garments; procedural fuzz on garments to preserve tactile quality of materials; parallax effect was added on hair geometry to give an appearance of depth and movement.

Since diffuse illumination was used, it was challenging for Lighting to shape the characters and sets to guide the viewer's eye to follow the story. In the designs for *Abstract Thought* eye and mouth pieces appeared dimensional in some stages while in others they were flat and projected back onto the faces. This process required careful planning and collaboration between animation, rigging, shading and lighting departments, but allowed the sequence to distinguish itself with its very unique style from the rest of *Inside Out*.