Reinterpreting Memorable Characters in Incredibles 2

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Figure 1: Updated characters in Incredibles 2. ©Disney/Pixar

ABSTRACT

Unlike other Pixar sequels in which characters must be resurrected, on Incredibles 2, we were encouraged to delve into the original archived character designs and deliver on qualities that could not be achieved prior to 2004 when the first Incredibles was made. More than any other film, we leaned on 2D drawing and design techniques to drive the way we modeled and rigged. We share our methods on how we both redesigned and stayed true to the essence of these legacy characters.

CCS CONCEPTS

• **Computing methodologies** → **Mesh models**; **Animation**; *Mesh geometry models*;

KEYWORDS

design, appeal, modeling, rigging, animation

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1 INTRODUCTION

The Incredibles was Pixar's first attempt at creating a world filled with stylized humans. It was made during a time when simulating long hair had yet to be done and "blendshape" was a buzz-word. The characters were an impressive feat for their time. With Incredibles 2 came an enthusiasm and commitment to better capture the intent of the first film in re-creating these iconic characters. This was not to be a show where we merely resurrect old assets; we set out to faithfully translate the line quality of Tony Fucile's character designs and better implement 2D concepts into 3D. We were determined to put design first, not only in modeling, but in rigging as well. Doing so, however, required that we still respect the collective memory and fondness that we and moviegoers alike share of the original characters.

2 ENHANCING LEGACY

Our first step in this process was to sift through the archived drawings, as we received no new design packets for the original characters. As we brought them into a more modern sensibility, we found ourselves oscillating among three masters: the legacy asset, the original artwork, and our dreams for how they ought to look. Our software and experience bringing stylized human characters to screen has matured greatly since the original film, and with each new iteration, our creative loop tightened and brought us closer to the characters as we remember them.

Figure 2: Bob from The Incredibles vs Bob from The Incredibles 2 ©Disney/Pixar

Shortcomings in the original models included: a lack of fullness in the face and body, outdated topology, and a lack of adherence

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to anatomy as evidenced by omission of anatomical features or unnatural neutral mesh configurations. We advanced our topology in many areas to better support the intended stylization of musculature and its deformations. One such example can be seen in the topology in the forearms and legs. These areas changed to support more natural pronation and supination of the limbs in motion. First, these efforts were carried out on Bob's topology and later served to define the look of the remaining characters on the show. From his topology we also extracted a face colored ecorche, mapping edge-flow to specific muscle groups. This ecorche was helpful in keeping modeling, rigging and animation accountable. With the super hero crew wearing skin tight body suits for half of the film, it was critical that these features be respected. Slimmer characters like Violet and Helen often required that anatomical cues appear only in tense situations and otherwise smooth away. We used a newly developed spherical pose space deformer developed by Pixar's tools team to help us maintain silhouettes and 2D appeal across multiple poses.

Figure 3: Our fist target: drawings of Bob's and Violet's fists by Tony Fucile ©Disney/Pixar

Hands are a critical element when chasing appeal in a character as they're often showcased in extreme close-up shots, and we observed several ways in which we could improve their posing from the first film. Historically, our convention is to model the fingers straight for easier modeling and joint placement. We wished to retain that practice, but noted that it compromises the look of clenched fists, and other tense hand shapes. This is due to the fingers not orienting to the metacarpal joints during flexion. Our approach consisted of pre-firing a splay of the fingers, thereby aligning them with the metacarpals and allowing the fingers to bend inward toward the palm. Our rigs were also updated to accommodate more natural looking palm twisting behavior. In general, all characters' hands were increased in size from the original film and special attention was paid to the transition from the wrist to the blade of the hand. Further complicating things, many female hands, such as Violet's, had long, slim fingers in relaxed poses, which required cheating of proportions in order to create the strong fist shape in Figure 3.

3 2D CONCEPTS IN 3D

Despite the trend in realistic rendering, we developed ways to replicate 2D concepts in 3D.

Figure 4: Balancing realistic rendering with stylized plane changes ©Disney/Pixar

As our lighting technology continues to advance, it's often the case that our characters shy away from delineated planes that could catch light easily and potentially become distracting. However, the world of the Incredibles takes place in mid-century, and our characters ought to carry motif's found in that time period's art style. Therefore, we took greater liberty in adding planes and noteable edges to our surfaces. Even Jack-Jack, being a baby, has a subtle plane along his brow as can be seen in Figure 4. "Straights into curves" is a fundamental 2D design principle that gives drawings contrast and rhythm, but our models are built with subdivision surfaces, which, by their very nature tend toward smoothness. We sought to incorporate that 2D language in new lip controls and an overhauled brow rig. Lips can blend between our traditional Bezier splines into linear splines, allowing animators to pose the lips with appeal and tension. Our brow rig used a similar technique for bold shaping, but additionally mixed in muscular influences.

In 2D animation, mouth shapes can easily cheated to create more appealing shapes. These shapes are more difficult to cheat with physically based lighting. Simply opening one of our character's mouths creates a clinical football shape or what Bird dubbed, "lemon mouth". Our standard mouth 3/4 cheat control developed during Ratatouille, dug into the face to preserve some cheek volume, but we found that the lighting exposed our cheat, and gave us undesirable creasing and shadows. We instead combated the lemon mouth shapes by adjusting our controls to slide on the surface of the lips.

New features were added to the characters to support the drawovers we were getting. Violet's eyebags are more naturally integrated with additional details that emphasize tension. Helen was given dimples to break up the large expanse of her cheeks and crows feet to balance her age against Violet, and Bob's dimple was rigged such that it automatically reacts the the position of the corner of his mouth.

4 CONCLUSION

We presented several changes to our workflow that allowed us to create more stylized characters that are still believable in a physically shaded and lit world. We were inspired by 2D animation practices and the original source material, but we could not deviate so far from the characters so as to lose their familiarity. Our collaboration with art and animation led us to improved characters that deliver on the promise of the original film.