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San Francisco, CA

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Through the speed of Maya and our incredible team, we animated 70 shots in just five days, and much of the movie's third act in just two weeks.

—Paul Kavanagh
Animation Director
Industrial Light & Magic

Dream Team

Industrial Light & Magic brings Star Trek to a new generation.



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Summary

In the movie business, summertime means blockbuster sequels and rip-roaring remakes. Creating new storylines for old favorites, however, has proved to be a largely hit-or-miss venture. The offerings typically run the gamut from good to bad to just plain ugly, but it is difficult to argue with the success of J. J. Abrams' Star Trek. Despite 11 previous feature films, four television series spanning 18 years, and an exacting cult following, Abrams elected to introduce the familiar characters of the short-lived 1966 television series to a new generation of moviegoers.

This gutsy move pays off in every way imaginable. With upwards of one thousand spectacular visual effects shots, Abrams and the extensive effects team at Industrial Light & Magic (ILM) used advanced visual effects technology in Autodesk® Maya® software, Autodesk® Flame® software, and Autodesk® Inferno® software to not only help revitalize the original series, but also capture and crystallize its spirit. By harking back to younger versions of Kirk, Spock, Uhura, et al., Abrams and his team have gone where no one has gone before, moving the franchise inexorably forward.

The Challenge

From project outset, the iconic quirkiness of the original series loomed over the new project. With an extensive canon and assumptions built up by so many "Trekkies" over the last four decades, how could Abrams and his team possibly create something that was not simply a vastly more expensive derivative of the original?

Though not a Trekkie himself, ILM Associate Visual Effects Supervisor and Compositing Supervisor Eddie Pasquarello does admit to having watched Star Trek II: The Wrath of Khan (1982) at least a dozen times. When he heard about the new film project, he knew he wanted in.

"When I heard J. J. Abrams was directing and Roger Guyett would be the visual effects supervisor, I was sold," says Pasquarello. "We knew from the start that striking a balance between a fresh new vision and that old, beloved spirit of Star Trek would be a priority. All of the classic Star Trek effects like the transporter, warp speed, and phaser blasts needed to be true to the original, but created with an entirely fresh eye. With that in mind, we created a lot of the effects using Flame and Inferno in our SABRE department, knowing we could do something really special."

Based on Autodesk® Flame® and Autodesk® Inferno® software, ILM's compositing department shared the 797 effects shots with Animation Director Paul Kavanagh's animation team, who rely almost exclusively on Autodesk® Maya® software. "We knew we would have our work cut out for us, with an immense number of very complex shots required in a very short time frame," says Kavanagh.

Star Trek had a perfect marriage of tremendous talent and incredible software. That combination made us confident enough to go after bigger and better shots. The power and flexibility of Flame and Inferno in our SABRE setup made us sure we'd get amazing results.



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The Solutions

Faced with a huge number of shots and a short period of time, Kavanagh and his team came up with some imaginative solutions.

"Usually, our 'layout' or camera department will attempt to create a shot based on a strong animatic created by our animation department," he explains. "Layout will do the camera work and block out the sequence, we'll get it working from an animation perspective, and they will tweak the cameras to make it look right. That back-and-forth process can take a while, and we simply didn't have that kind of time."

The solution? Combine the layout and animation departments into a single, seamless team that would work on shots from start to finish.

"We had an incredibly strong and talented group of people who happened to be very skilled in both disciplines," says Kavanagh. "It really sped up the process. Still, we knew we were asking a great deal of our artists. Our team eventually grew to 17 people, and we set up our entire pipeline in Maya. Maya was exceptionally good at speeding the shots through, which was particularly helpful when J. J. wanted new scenes or changes."

The blend of a talented team and Autodesk Maya proved so efficient, in fact, that Abrams asked ILM to perform their own previsualization and animatic work on the new and ambitious shots coming through late in the process.

"Through the speed of Maya and our incredible team, we animated 70 shots in just five days and much of the movie's third act in two weeks," says Kavanagh. "The hardware rendering tools in Maya were exceptionally important, because we were able to render really quickly with lighting and shadows."

On the visual effects and compositing side, Pasquallero and his team were given similar creative latitude. "Working on Star Trek was almost like having a blank sheet of paper," he says. "There were a lot of challenging shots in the movie, but none so much as the black hole that swallows up the enemy ship at the end. Our SABRE team of Inferno and Flame artists, including Alex Tropiec, Ben O'Brien, Kevin May, and others, gave the black hole its absolutely photorealistic, beautiful look, and they did it using Flame and Inferno. It truly was an optimal blend of talent and technology."

The Results

"Star Trek was a perfect marriage of tremendous talent and incredible software," says Pasquallero. "That combination made us confident enough to go after bigger and better shots. More than that, though, the reliability of the software helped us imagine more ambitious shots. The power and flexibility of Inferno and Flame in our SABRE setup made us sure we'd get amazing results. The movie is really outstanding, and I am very proud of my team."

Kavanagh agrees: "With Flame, Inferno and Maya, Star Trek was simply a lot of hard work by a lot of extremely talented people."

To learn more about Autodesk Maya, visit www.autodesk.com/maya.

To learn more about Autodesk Flame, visit www.autodesk.com/flame.