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NOT GEEK TO ME

When the levee breaks... in 3D

Kavita Kukday Deb | October 23, 2010



Sohan Roy's 3D venture on an ailing water dam in Cochin has recently been completed. TOI-CREST goes behind the scenes to find out how a graphic artist and advanced software can convert a flat 2D movie into 3D.

After the success of James Cameron's Avatar, moviemakers - it seems - are scrambling over themselves for that extra

dimension. Everyone wants to go 3D: The next two Harry Potter flicks, the classic Alice in Wonderland and closer to home, Sohan Roy's big-screen directorial debut Dam 999, to name just a few.

But not all such flicks are shot in 3D. Many studios shoot in 2D, and then retrofit them with the third dimension. Roy, with the help of Chennai-based special-effects firm Prasad EFX, has used this very technique to portray an impending water dam disaster in his movie, which will be screened between November 3 and 10 at the American Film Award festival.

"Everyone knows how dangerous nuclear bombs can be, but very few can fathom that a dam - another of man's creations - is capable of more widespread damage than a nuke," says Roy, explaining Dam 999's subject. "For instance, take the 1975 Chinese 'Banqiao Dam' catastrophe, which claimed 2.5 lakh lives. A 100-year-old dam in Cochin, built during the British Raj, threatens a similar fate. We have hundreds of ailing dams around the world and there was no other way to depict this tragedy-in-the-waiting without bringing in some aspect of 3D to the movie," he says.

But why not shoot in 3D? Roy believes it's easier to shoot movies like Avatar, which are mostly computer graphics with stereoscopic 3D cameras. "But when you are shooting a real-life drama that needs you to go to crazy underwater locations, aboard ships, and capturing the nooks and crannies of Cochin's interiors, heavy 3D cameras can become a nightmare," he says.

Cost saving is another reason for shooting a movie in 2D and converting it to 3D. And finally, everyone is familiar with traditional cameras. Shooting a film in 3D puts limitations on directors where you need to maximise the depth effect while minimising the eye-strain that you can potentially cause your viewers. "But look at the level of detail in the faces and in the scenes of Dam 999. Try spotting the conversion... you will never be able to tell the difference," he claims.

"The topic is very close to my heart (and home), and if the dam actually breaks it will easily claim over 2.5 million lives," he says. "My biggest challenge was to make a movie as realistic as possible, using the very best technology, so people understand the gravity of the situation," Roy adds. The equipment, for instance, included the top-of-the-line ARRICAM ST 35-mm camera system. "There is no comparison between things you can do with this single lightweight unit, as opposed to the heavyweight giant stereoscopic 3D cameras," he grins.

But shooting was only a small part of the moviemaking process for Dam 999. Roy's team

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of special effects artists had a whopping four thousand scanned shots, which needed to be tackled frame by frame to convert from 2D into 3D (see box).

Talk about the cataclysmic climax sequence of the movie and Roy has an unmistakable lilt of excitement in his voice. "We had a custom-designed , hydraulically-operated storage tank built for this scene, and we used liquid nitrogen to blast about 30,000 litres of water in less than a second onto a large (almost life-sized) film set, which included villages, bridges and people. Special lenses and variable film speed were used to create the shots, which were then composited with the graphically-designed shots to create a nail-biting scene," he claims.

Finally, when asked if he expects a blockbuster, Roy says that all he hopes is that his movie "draws the world's attention to fixing leaking dams; something that could save billions of lives" .

We hope so too. Dam 999 is set to hit theatres in early 2011.

The pains of conversion...

3D movies are normally filmed using two slightly offset cameras. Both images are projected onto the viewing screen and funnelled through 3D-glasses , feeding one image into your left eye and the other into your right. But in case of movies like Dam 999, where the movie is shot with two different 2D cameras, you get two different flat feeds. These feeds are split into two offset images, based on the flat camera feeds to create a 3D effect. The process is something like peeling different layers of an onion, processing them and then putting them back together like they were never torn apart.

The first step in the conversion is to separate the shot into anything between two and twelve layers of depth. Take, for example, the shot of actors Vinay Rai and Vimala Raman standing in front of a wall. The graphic artists had to separate the shot into multiple layers such as the actors, the wall, trees, flowers and so on. Then, they took every layer separately and drew shapes around any object that appeared there. They started by marking depth lines around the actors on the computer, turning the image into a sort of topographical map. They repeated the same process for objects in the other layers as well. (The orange flowers on the trees, for instance, also got their own depth lines).

After the graphic artist finished drawing the topographic map, the software took over: First, it created a new offset image of one layer (for instance, the actors), by moving the different parts of the topographic map to the left or right and later smoothing everything out. Here the closest bits, like Vinay's head would be moved the leftmost, while the more distant parts - such as his left shoulder - would be displaced a little less to create the second stream (for the other eye). Basically, this process must be completed for every object in every shot of the whole movie - an undertaking that took over four months with a team of 600 professionals and hundreds of terabytes of data. Another difference between converted movies and those shot with 3D cameras is the blanks that graphic artists have to fill in.

For example, in the same scene: When the actor had to be moved around against the wall, the shifting of the image left a lot of blank spaces. During the conversion process, the artists and the software had to fill in these blanks. Here the artists had to cut a piece of the background from somewhere else in the frame and paste it into the blank space left behind. This is where a graphic artist's craft comes into play, because if the cut and paste hasn't been done perfectly, viewers will be able to see the difference in the 3D imagery.

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