

Engineer Wins Sci-Tech Oscar for Visual Effects Tools

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from there," he said.

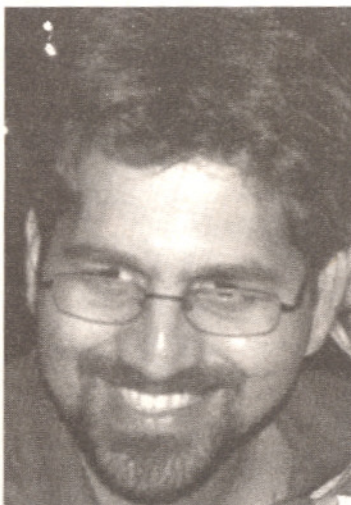
To give an example, Kokaram explained that one of the most popular software tools now in use removes black blotches on frames of film that are caused by tiny specks of dust. The software that automatically detects and removes blotches has come to be called a "DustBuster," he said, "but I prefer to call it a 'DeBlotcher.'"

"A 'DeBlotcher' has to detect the parts of each picture that are corrupted with dirt and then work out what should be there instead — i.e., replace the dirt with the clean picture 'underneath' somehow," Kokaram said.

"To understand how this works, think about every movie you have ever seen. There are 24 or 25 pictures taken every second and mostly every picture (a frame) is like the last one — except things move around from frame to frame. So if you find some image patch which is not present in the frames before or after, then something must be wrong. And this is the basis of 'blotch detection': the thing that is wrong is the 'blotch.'

"Now to work out what should have been there instead of the blotch, we need to look in the next or previous frames to pull the data into the current one. This is why motion estimation is so important. Because things move around between frames, we need to work out where everything moves to and where it all moved from. Then and only then can we work out what should be there in place of the blotch," he said.

Not only does Furnace software excel in motion estimation, but it can also tell what parts of an image are foreground and what parts are background, and another that can



Anil Kokaram, 39, of Dublin, Ireland, has won an Academy Award for his part designing a suite of visual effects software tools.

create whole new frames "in between" the standard 24 frames per second that viewers are used to.

"The 'inbetweeners' are one tool that has been very successful indeed," Kokaram told *India-West*. "Say you have 20 frames per second but you want 100. Then you need to create five more frames between every pair of frames you have. This uses motion estimation. It was used in the 'Matrix' films in the last four years, and Adobe are now incorporating it into their suite of tools."

Furnace is just one collection of software tools produced by a London company called The Foundry.

"It is this kind of thing that The Foundry have been doing over the last six years. They spotted that there has been a lot of research into motion estimation in the academic community, and that people like myself had been working on

ideas that could be used in post-production.

"My main expertise at the time was motion picture restoration and I had been working on stuff like Dust Busting and Noise Reduction for a decade before. So Bill Collis got me involved with them back in 2000 and together with Simon Robinson and Ben Kent, designed a software package called Furnace."

Before joining Trinity College's electronic and electrical engineering department in 1998, Kokaram earned a Ph.D. at Cambridge University.

According to his biography, his research work is mainly concerned with Digital Image Sequence Processing and especially Numerical Bayesian Inference, Motion Estimation, Content Based Image Retrieval (particularly sports content) and Motion Picture Restoration. His work in motion picture restoration is well known and he published in 1998 the book "Motion Picture Restoration" (Springer Verlag, publisher), which is considered the field's definitive text.

Kokaram has also founded Green Parrot Pictures, a visual effects software company targeting the broadcast industry.

In case you think he spends every waking moment staring at a computer screen, Kokaram adds this: "I do, however, occupy myself with other pursuits, the most engaging of which is cricket."

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