

Mirrormask

With several short films attracting the attention of Lisa Henson, acclaimed designer Dave McKean was asked to direct his first feature when Columbia Tristar commissioned a new fantasy project from The Jim Henson Company. Co-written with long term collaborator Neil Gaiman, the film combines live action with digital animation, most of the film being set in a spectacular computer generated world. With a uniquely low budget for such a complex project, Post Production Technical Supervisor Dave Barnard explains how it was made possible.

35mm Film Shoot



Director of Photography Tony Shearn used Kodak Vision2 film stock, ideal for the extensive low light and blue screen photography required, with Super 35mm Moviecam Compact and SL cameras, along with Arri 435/535 for variable speed shots. Digital cinematography had been considered at the outset, but at the time the systems tested had too many teething problems for such a demanding project. The Thomson Viper was used very successfully for a later pick-up shoot, combining well with the film originated material after matching and grading.

Offline Edits



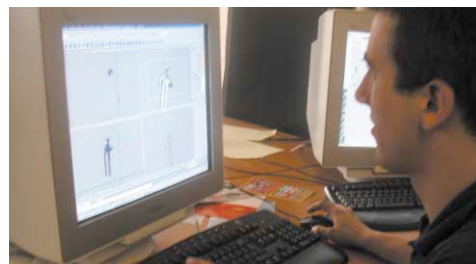
Nick Gaster used Avid Film Composer for the original offline edit from Betacam telecine rushes, producing EDLs and neg pull lists. Dave McKean later created a 'Storyboard Offline' adding rough versions of the SFX shots, using the keying and effects facilities of In-Sync's Speed Razor. Unlike Final Cut Pro used for the online edit, neither system could edit natively at 24fps, which caused a number of complications with audio pitch, and changes to the edit made at the second offline stage. Editing 24fps throughout would have certainly prevented many headaches!

Spirit HD DataCine



The neg pull lists from the Avid offline were used to scan the required shots directly from the original film lab rolls, avoiding any potential problems with a cut negative. The location and studio footage was graded and output as 1080 HD resolution 10-bit DPX files, using the Thomson Spirit DataCine at Digital Film Lab's London facility. About 3Tb of original film plates were transferred as the Hourglass Studios post facility was being constructed, using 250Gb Firewire hard drives.

3D Models



CG Producer Max McMullin recruited fifteen

Matt and Textures



Linux NAS Servers



CGI Producer Max McManis recruited fifteen animators for the project, many being graduates from the BA and MA Computer Animation courses at Bournemouth University. They used Maya 5 Complete and Unlimited on WindowsXP, with AMD MP2800 workstations supplied by Max Black. Having a facility dedicated to the project allowed the Director and CGI Producer to work very closely with the animators, providing an environment that enabled many young talents to shine, despite the pressure of the schedule.

A major task was the creation of the blue mattes, ably handled by two Key Animators using After Effects Colour Difference keyer on Apple G5 workstations. A Sony F900 HDCAM was used for "character acquisition" - full face shots of actors mapped onto the 3D geometry of their digital characters, along with their dialogue. This caused some confusion with the actor's agents - how do you charge for a performance where only the mouth is seen? Other textures scanned or filmed included antique books, the plumage of stuffed bird and a large quantity of Golden Syrup!

High performance systems from Blue Arc and Max-T were initially evaluated, but the increasing demands for storage meant that they were not affordable within the limited budget available. Linux based NAS servers giving 10Tb storage were custom designed in conjunction with Mark Ray of Cybernex Computers, who worked tirelessly to supply the kit over the critical New Year break. The drives used to transfer the film plates even gained a second lease of life as part of the network storage.

Final Cut RAID Storage



To meet the demanding disk speeds required for uncompressed HD editing, two fully specced Apple XServe RAID units were used, giving 6Tb storage with dual 2Gb Fibre Channel connections. A SAN network was considered, but the high cost of hardware and software along with sharing limitations, kept gigabit ethernet at the heart of the network. The forthcoming Apple XSan and lower cost fibre switches look set to improve matters in the next few months.

Render Cluster



Very large textures, 3D datasets and extensive fluid effects are challenging to render, but the 40 CPU AMD Opteron render farm at Hourglass gave a fast and stable performance with both the Maya renderer and Mental Ray. FXC from High Definition Render allowed the Linux render nodes to operate as a internet managed cluster, Henrik Norin providing excellent support and enhancements for the newly developed software. Smedge from Uberware allowed the Windows workstations to be easily used for rendering too.

3D Animation



Rather than use motion control on the shoot, Mirrormask's VFX pipeline principally used the studio film plates as textures in the 3D scenes. Maya could not handle the DPX files directly, so a 8-bit tiff version was created along with the key frame. As the footage had already been graded, colour banding did not become a problem in final shots. Maya's Render Layers facility was used extensively to create the images for final compositing, including specular, depth and shadow passes.

Final Composites



With Director Dave McKean creating the final shots for the entire film, After Effects was the natural choice of compositing software for an experienced Photoshop artist. GenArts Sapphire plug-ins were used extensively throughout, along with Synthetic Aperture's Colour Finesse and RE:Vision's Reel Smart Motion Blur and Twixtor. After Effects made good use of the 64bit G5 processor in a dual 2Ghz system with 4Gb RAM and 1Tb of internal disk storage. Completed shots were rendered out using the BlackMagic 10bit uncompressed HD Quicktime codec.

FCP HD Online



The BlackMagic DecklinkHD proved ideal for production, its low cost allowing much needed budget flexibility. Based in a similar G5 system, it performed very reliably. Online editor Keith Mottram used Final Cut Pro HD, probably the first time it has been used to finish a studio feature. The edit was monitored with a Sony FW900 and Miranda 870p converter, the 24" CRT giving very good black levels and only minor colour differences to a reference BVM-D24. We are evaluating a Lasergraphics film recorder for final output, recording directly from the final Quicktime. Cinema release has been set for January 2005, hope to see you there!

