A case study in web3d film-making: Horses for Courses

This is a presentation of the web3d pipeline and production process used to deliver the multi-lingual interactive animated short film *Horses for Courses* — winner of the Web3d Roundup art prize at *SIGGRAPH 2001*. The film features English, French and Spanish soundtracks, different endings, mouse triggered hotspots, and manual camera controls. Photography, low-polygon modelling, and optimised texture maps, were key to publishing the film as low-bandwidth streaming media in July 2001. The pipeline developed for this project has since been used to achieve higher resolution output for offline applications.

The idea

Our original aim was to create a short film that doubled as an interactive toy over a 56K modem connection. We also wanted to assess the suitability of web3d for delivering cost-effective cross-cultural animation. The title comes from an expression meaning a person or thing being employed for the purpose for which it is best suited. Pan was chosen as the main character since he has, like the Internet itself, been absorbed and reinterpreted by different cultures. The film was also able to demonstrate a subtle approach to interactivity where various types of interaction, such as non-linear storytelling and e-commerce, could be included without compromising the linear viewing experience. Although budget constraints meant that the pipeline had to make extensive use of off-the-shelf packages, the film's assets were kept separate from the chosen delivery format to support backwards and forward-compatibility with other media.

Pan was modelled using a real actor wearing theatrical make-up

The web3d pipeline

All original assets, 3D models, texture maps and audio were created at broadcast quality. We chose the *b3d Studio* system to rapidly organise all assets into a library of characters, props, sets, and scenes. Original 3D models and animated sequences were created in *3D Studio Max 4.0* and exported to the *b3d* library. *B3d Studio* was used to fine-tune parameters of each scene and construct non-linear paths between scenes. The script played off the medium and included 2D visuals which helped to minimise the polygon count. Texture maps, rather than modelling, were emphasised throughout the pipeline to limit bandwidth and 3D playback requirements. Reference 360° photographs were taken of an actor wearing

All of the film's original assets were created at broadcast quality

theatrical make-up, prior to 3D modelling and animation of the main character in *Max*. Photographs were also used to plan facial morph targets created in *Max* and then referenced from within *b3d Studio* as labelled 'gestures'. The pipeline removed the need to go back to *Max* for many animation tweaks. Cameras, lighting and facial animation were controlled during the editing phase in *b3d Studio*. This also facilitated the layering of interactivity such as an alternative ending, choice of three soundtracks, as well as incidental animation and audio triggered by hotspots. Control over behaviour keys meant that it was easy to add interaction feedback cues without having to create new animation sequences separately — allowing Pan to grin at the user, for example. This approach also worked well for internationalisation. Scenes which contained language elements were replicated for ease-of-management. References to extra audio, text captions, and bitmaps that contained text were adjusted accordingly in each scene. The process was similar to DVD authoring but with far greater flexibility in how the visual elements could be manipulated at run-time.

The streamed delivery process

Our biggest challenge was to ensure delivery over a low-bandwidth modem connection — the five minute film came in at just over 3Mb. The *b3d* delivery system allowed for assets to be independently cached on the user's computer for later reference, and this made it possible to re-use assets in multiple scenes. Using this method, Pan's head was used in a web3d banner ad campaign prior to release and the first film environment, Pan's forest, was included as part of the film's 300K loading sequence. Users were able to explore the forest while waiting for the rest of the film to download. We also wanted to use the pilot to capture feedback on the user experience. By sub-dividing the film into streaming chunks, we were able to use web logs to track the most popular interactive elements. At the last count, the clear winner was the choice of language.

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