

Technical Statement

LiQin Tan

As a pioneer researcher in the field of digital rawhide/wood/rock prints, Tan faced some incredible technical challenges, which required considerable time and effort to solve since there was very little reference material available. Throughout the process, Tan has been able to provide suggestions to printer companies on the modification of printers to adjust to different rawhide qualities, thickness, and hygroscopicity.

Unique 3D images are printed on rawhide/wood/rock surface by HP DesignJet 455ca and Encad NovaJet 880 printers, a procedure that involves using printing technology on exotic materials. Each of Tan's prints is the result of extensive research, in terms of color consistency and materials experimentation.

The making of vellum and rawhides was a primitive skilled process. Numerous animal skins were used, such as calf, deer and goat. The skins were washed and stripped of hair or wool, then stretched on a frame to be scraped to remove further traces of flesh or hair. The scraping process requires meticulous attention in order to remove all unnecessary materials without piercing or tearing the skin. The skins are then whitened with chalk and flatted with pumice on its surface. Finally, the back is sanded down for the digital printing and digital projection.

Rock-prints series adopt the Matrox multi-display system, which allows the use of six monitors where on-screen information can be moved from one display to another. Together, the six displays in the system form one large lava animation clip. An accurate virtual reflection from a mirror depends on the its convex index, image shape and dimension. The former determines the size of the reflected lava animation from the LCD TVs, and the latter determines the distance.

Likewise, finding facilities to handle the enormous size 3D still-renderings and sequences for the "Digital-Nature" series was extremely challenging. As a matter of fact, initial research tests conducted in the animation labs indicated that it would be impossible to achieve Tan research needs – impressive high-in and render-farm job equipment would be necessary to process our 15,000 X 12,000 pixel images and 4320 X 480 resolution sequences with globe-illumination & final-gathering effects. With the limited educational funding, Tan worked with what he had. In the end, what initially deemed impossible was solved by building and programming school own version of a render farm by clustering batches of available computers and sharing the demanding job across them. Overall, it was only by creating these necessary technical tools along with others that they were

able to explore the synthesis between the modern digital world and the primitive one in the “Digital-Nature” series.

During the production phase, various digital software were used. From drawing preliminary sketches to final renderings, the studio production process will take a few months and a year.

Exploring digital rigid-material printing and the simulation of digital rust-progression, “Rusty Faces” examines new methods of large-scale printing on metal materials, while simultaneously investigating efficient workflows for large-scale rendering. A special Encad NovaJet 880 printer has been used to develop the necessary results.

To achieve the rusting process on the metal objects, a combination of animated texture masks, transparency masks, and specular masks is exercised. The two-dimensional animation of the mask and maps translates onto each piece of 3D geometry affecting the intensity of the specularity, transparency, and rust simulation.

In addition, the main animation employs rigid body simulation for the brain’s disintegration, which has been animated progressively deteriorating. Particle simulation is employed as well to create the forms of two fetuses and a brain.

The project required several different software packages to realize its vision. All of the 3D modeling, texturing, animation, and rendering were completed in *Softimage|XSI*, while all post-production work was executed in *Adobe AfterEffects* and *AutoDesk Combustion*.