TECH NEWS

Computer Animation: An Overview

by norman stangel and ray mcmillan

Over the past 15 years the computer has significantly changed the look of animation. The three categories for the use of the computer in animation are:
— computer controlled cameras (motion control),
— analog computer animation,
— digital computer image generating.

Computer controlled animation camera systems have eliminated much of the drudgery of shooting graphics. Most of the elaborate graphic animation we see on network television, or in commercials, involves numerous exposures over the same strip of film to create the desired effect. The procedure would be very tedious, and in some cases impossible, without the aid of the computer. The degree of accuracy and control of all camera functions has allowed for new techniques of painting with light on film, with subtle qualities previously impossible to achieve using a manual camera system. The use of streak titles and slit-scan effects can give flat graphics a more dynamic, dimensional look.

The analog computer is capable of moving images in real time using high contrast graphic art. The motion generated by this form of computer is perhaps best described as image distortion. A major advantage of this system is that graphics can be generated quickly and effectively within a short time period. High contrast art is placed on a light box and is then viewed by a camera that feeds directly into the computer. The motion is generated by controlling the shape of the rastor (a measure of horizontal and vertical points on a cathode ray tube). Colour is applied electronically through an assignment of grey scale levels, and is infinitely variable.

However, the most impressive technology available is digital computer animation. Here, there are two categories to consider: the two-dimensional (2-D) system, which is used as an aid to conventional cel animation, or cartoon animation; as well as graphic animation and state-of-the-art, three-dimensional (3-D), digital animation.

The 2-D system can use the animators original key pencil drawings with the computer generating the inbetween drawings. The background paintings can be drawn and painted directly into the memory of the computer, with all the subtlety and detail of a conventional painting done in any medium (water-colours, oils, pastels, etc.). The animated characters are coloured electronically with no limit ot the choice of colour palet. Labour-saving is achieved through the computer's capability of painting up to 10 drawings in a sequence, at one time, directly into memory. Once the characters are coloured they are combined electronically with the background and recorded onto 2" video tape or to 35mm motion picture film. A major advantage of this system is that as many as 150 levels (places of action) can be layered at one time, as opposed to five levels in conventional animation. As software programming improves and equipment costs reduce, there is no question that this system will replace conventional animation technology as we know it.

Technology has provided us with yet a further breakthrough in the form of 3-D digital animation. Only budgets, and lack of imagination, limit this technique at present. It is difficult to comprehend that it is possible to produce anything you can conceive of on this computer. However, considering that there is complete control over every portion of the image area, it is possible to begin understanding the potentials. A programmer could construct a building and literally walk you through the halls before it is ever built; or drive you along a highway that doesn't exist. This is possible because the image is translated to digital information in memory, and can be manipulated in any way. At the moment, an operator of the 3-D system requires a sound background in mathematics and computer programming; however, as software programming develops, it is conceivable that a layman could program this computer, using standard language commands, in about five years time.

The future looks exciting when you consider the endless possibilities of combining film video tape, and digital computer technology. ■

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