

what are computer graphics ?

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what are computer graphics In the popular press, computer graphics sound wonderful. They mirror real life, if anything they are better. Computer users no longer have to struggle with arcane and cumbersome user interfaces.

Everything will be intuitive. Unfortunately it's not that simple. A recurring theme within discussion of this technology is that while there are some aspects of Computer Graphics and Virtual Reality which are easy there are some which present a host of new design problems (Wexelblat, 1993).

When we look at a TV screen or movie, it is much the same as looking through a window - except that the scenario and unfolding events are typically distant in place and time. When we look at a computer screen it is much the same, except that the scenario and events are now not 'real' but computer generated: the environment we are looking at is 'virtual', it is a representation of the real world (Slater and Wilbur, 1995).

To visualise is to bring something as a picture before the mind. This is exactly what the visualisation software and hardware systems are trying to achieve. For years, various visualisation tools have been developed to help scientists to have a better understanding of problems of their concern. These tools can be used to create something as simple as 2-D images such as graphs, or it can be used to generate complicated 3-D images (Jean et al, 1991). Advances in computer hardware technology have led to an increase in the power available to computer users. Major software houses have kept pace with these advances developing software which utilises the technology available. Many engineers are now familiar with three-dimensional CAD systems and use them routinely in their work place. Many specialised software/CAD packages have become available dealing with particular aspects of the minerals field, such as geology, mine design or land reclamation.

These packages also offer a range of features such as advanced graphical user interfaces, full three dimensional modelling and solid modelling options. These systems will continue to change as photo-realistic rendering and Virtual Reality options become more widespread. The term 'computer graphics' as used above refers to a set of computer applications which can be used to produce images and animations which would have been impossible with the technology available only a few years ago. To produce high resolution computer graphics a three dimensional geometry is defined using conventional CAD software.

A range of texture maps are then applied to create solid three dimensional objects (texture maps are the computer graphics equivalent of applying patterned wallpaper over an object). Lighting conditions are then defined and objects are viewed from a range of different camera positions. If enough time and effort is put into creating these worlds the images produced can be difficult to distinguish from photographic images. A more advanced feature available at the higher end of the graphics market is the ability to create sequences of rendered frames and thus display these as an animation, or film.