

## **Abstract**

Three-dimensional computer graphics is a fascinating subject as it provides a mechanism to build and view three-dimensional objects without any physical materials. It has now embraces a larger number of application areas, from the fantasy world of film and television to more practical areas such as CAD of mechanical engineering parts. In this sense, three-dimensional graphics is possibly the most important aspect of computer graphics.

Industrial applications of computer animation include product visualizations of cars, engineering components and construction projects such as bridges, tunnels and hydro-electric schemes. In flight simulators, real time image generators create sophisticated 3-D coloured scenes of international airports, and within the safety of these virtual environments, pilots can be trained to develop flying skills and practice emergency procedures.

In this project we will emphasize much on an interactive environment where the user can construct three dimensional geometric figures using various software tools. A menu-driven interface provides the user with a wealth of features that include: a library of graphic primitives such as boxes, spheres, cylinders, pyramids and cones; facilities for creating, deleting, shading, translating, rotating, extruding and sweeping; and some very powerful tools for allowing the user to view the object from many view points.

A knowledge of mathematical techniques is very often useful, and one must be prepared to employ more and more mathematical techniques as one moves towards the advanced topics. However, the majority of the techniques explained in the following chapters only resort to a few mathematical tools which are used consistently to solve different problems.