

Parametric Representation of Three-dimensional Objects

The parametric representation of solids and curves is now an established tool in computer graphics, particularly in computer-aided design (CAD). Techniques that were originally developed to model car bodies and aircraft shapes are now applied in the many diverse branches of computer graphics. For example, the techniques are used in object modelling and subsequent interactive design and in animation key framing.

One of the most popular parametric formulations is the Bezier patch, developed in the 1960s by Pierre Bezier for use in the design of Renault car bodies. His CAD system, UNISURF, in use by 1972, was no doubt responsible for the many varied models emerging from Renault's factories in the 1970s. In fact Bezier's work may have been preceded by the efforts of P. De Casteljaou at Citroen in the early 1960s. However his internal reports lay undiscovered until 1975. We may not be referring

The usual approach in considering parametric representations is to begin with a description of three-dimensional curves and then to generalize to surfaces. We shall adopt this trend, concentrating on Bezier and B-splines formulations.