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## **Interactive curve modeling: Creating and manipulating three dimensional objects using two dimensional input**

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In modern computer graphics, especially in the field of modeling and animation, polygons are the preferred method used to design three dimensional objects. However, because polygons are made up of vertices and linear edges, they are not inherently smooth. Furthermore, many physical objects cannot be accurately recreated using only flat, concave, or convex polygons. One method to solving this problem uses cubic curves, curves with a degree of three, to define surfaces in three dimensional space. Cubic curves are inherently smooth, and allow for surfaces of any type to be replicated with the utmost authenticity. Using an interactive curve editor, a program to create, edit, and manipulate cubic curves, the results show that defining a curve using cubic curve equations is much easier and efficient to do than with the standard line segment method. I believe the same results would occur if one were to compare creating a surface with curves as opposed to attempting to produce that same surface with polygons. The next step towards expanding this technology and testing the aforementioned hypothesis would be to write a program that will sweep one curve along another curve, thus creating a surface. These surfaces, defined purely by curves, would bring a heightened level of realism into modern computer graphics and would provide an alternative modeling method to the traditional polygonal modeling methods.