

On-Line Geometric Modeling Notes

CONTROL POINTS, POLYGONS AND MESHES

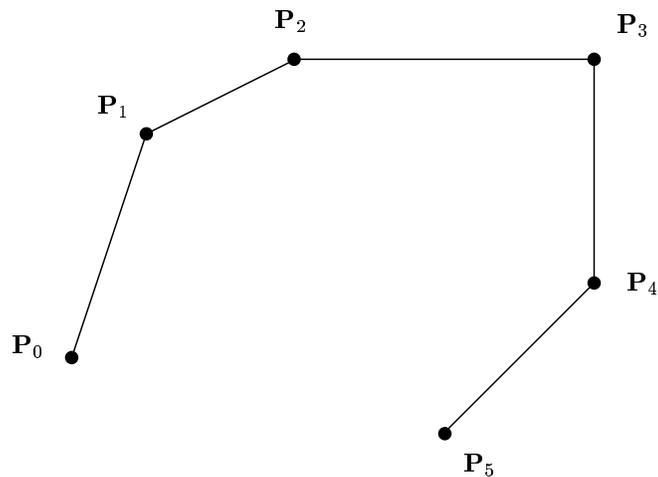
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Overview

One of the primary uses of “terminology” that one encounters when studying the field of geometric modeling is the concept of control points, control polygons and control meshes. These terms are used frequently and it is useful to be clear about their meanings.

Control Polygons

A *control polygon* is a sequence of points in space that is generally used to control the shape of an object.

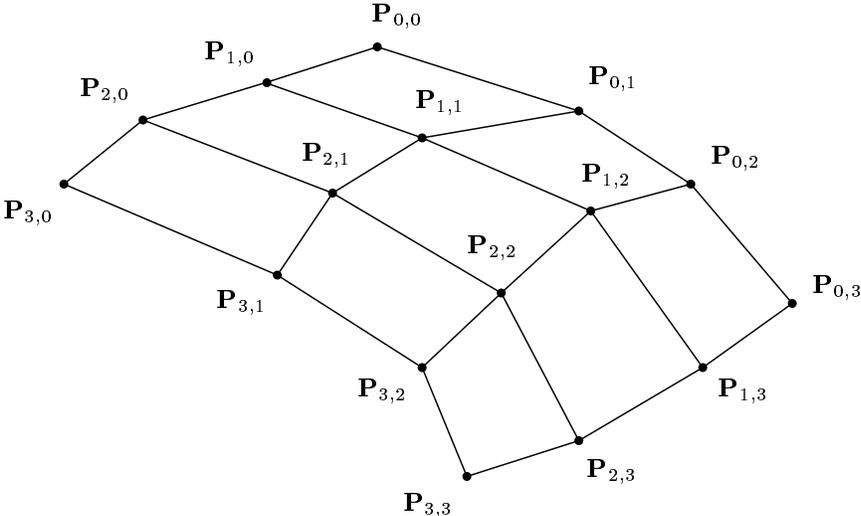


This terminology first arose from the development of the Bézier curve, where the curve is written as a linear combination of Bernstein polynomials. This linear combination is actually an affine combination, which implies that the coefficients are points, and these points control the shape of the curve.

There may be some confusion by the reader in relating the term “control polygon” to a closed planar polygon that is utilized in modeling. Here the term “control polygon” can represent any closed or open sequence of points – planar or not.

Control Meshes

A *control mesh* is the multidimensional analogue of the control polygon. It generally represents a set of control points and is used to control the shape of a surface.



In general, we represent surfaces in three-dimensions, but multidimensional (greater than three-dimensional) problems do exist, and in these cases the general term of “control mesh” (or infrequently, “control lattice”) is used.

Control Points

The term *control point* is used to represent the members of a control polygon or control mesh.
