Interpolation and Approximation Splines

Spline Representation

Spline is a flexible strip used to produce a smooth curve through a designed set of points.

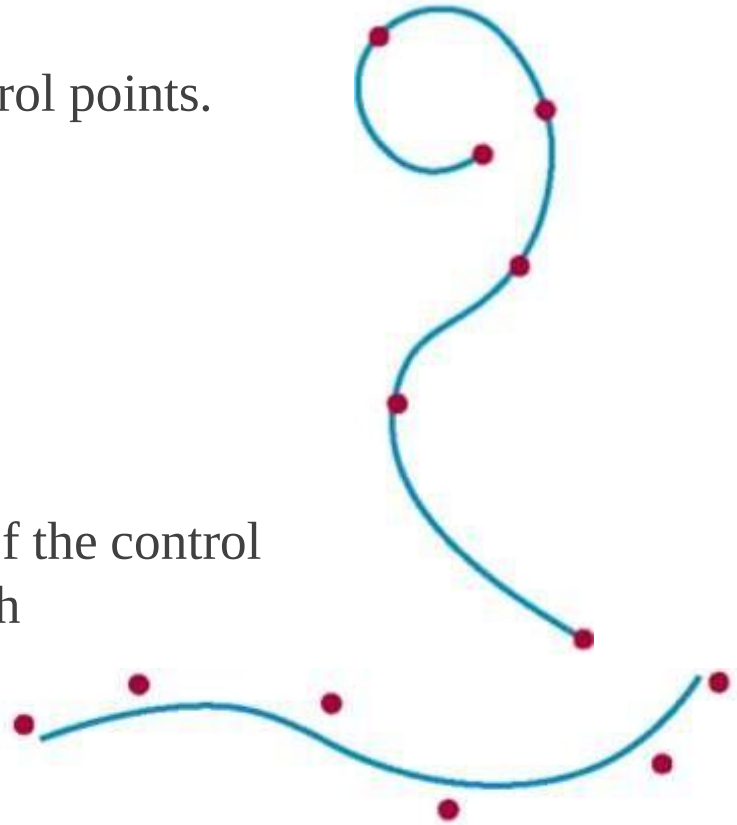
Spline mathematically describe with a piecewise cubic polynomial function whose first and second derivative are continuous across the various curve section.

A spline curve is specified using a set of coordinate position called **control points ,** which indicates the general shape of the curve.

There are two ways to fit a curve to these points:

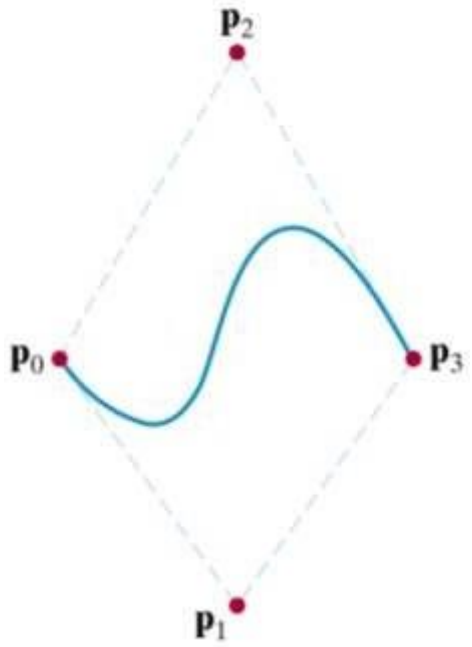
Interpolation - the curve passes through all of the control points.

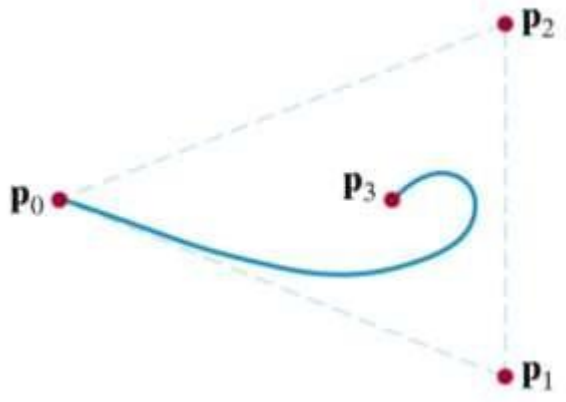
Approximation - the curve does not pass through all of the control points, that are fitted to the general control-point path



The spline curve is defined, modified and manipulated with operation on the control points.

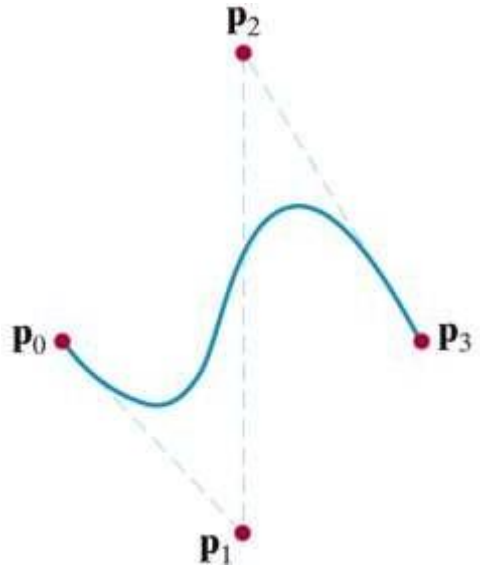
The boundary formed by the set of control points is known as a **convex hull**

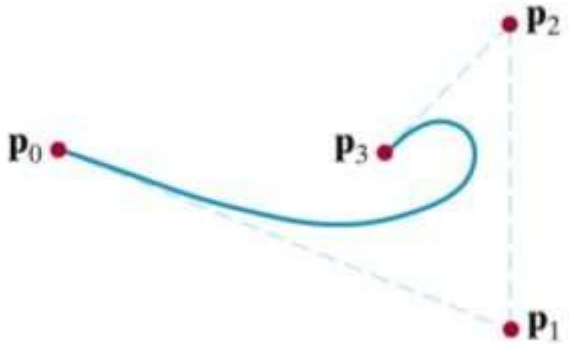




A polyline connecting the control points is known as a **control graph.**

Usually displayed to help designers keep track of their splines.





Other names for the series of straight-line sections connecting the control points in the order specified are **control polygon** and **characteristic polygon**.