

Department of Computer Science and Engineering
CSP: 316 Computer Graphics Lab

7. Curves: Aim is to understand free hand drawing. To understand nth order polynomial fitting techniques. To study parametric and non-parametric curves.

Write an interactive program to accept an arbitrary geometric matrix, basis matrix, and list of control points, and to draw the corresponding curves. Show the control polygon in a different colour using a dashed line. Show the corresponding curve in another colour using solid line. Show the control points. Find the conditions under which two joined Hermite curves have C0 and C1 continuity. Impose C0, C1 and C2 continuity constraints on two Bezier curves. The two curves should be shown in two different colours. The continuity constraints should be imposed interactively with the corresponding effect should immediately. Analyze the effect of repeated control points and collinear points.

Expand the program that allows the user to interactively create and refine piecewise continuous cubic curves. Represent the curves internally as B-Splines. Allow the user to specify how the curve is to be interactively manipulated as – Hermite, Bezier or B-Splines.

Assessment:

You should be able to answer the following questions.

The relationship between number of control points and the degree of the curve.

The convex hull or the control polygon and the oscillations of the curve.

How to define a curve with boundary constraints, with basis matrix and with blending functions?

How to draw closed curves?

What is the effect of repeated control points?

How to impose continuity constraints to join two curves?

How to draw a circle using Bezier curves?

Course Coordinator: