Advanced Graphics

(a) Describe the key features of B-splines that make them useful for representing curves in computer-aided design (CAD).

(b) Derive and graph the quadratic Bézier basis functions using the standard B-spline method and the knot vector [0,0,0,1,1,1].

(c) Describe Chaikin’s corner-cutting subdivision method that produces the quadratic Bézier curve in the limit.

(d) Describe the Doo–Sabin subdivision scheme, that is the generalisation of Chaikin’s method to the bi-variate case able to represent surfaces with extraordinary vertices.