

Rational B-spline Curves – Conic Sections

Conic sections described by quadratic curves

Consider quadratic rational B-spline

$$[X] = [0 \ 0 \ 0 \ 1 \ 1 \ 1]; \quad n + 1 = 3, \quad k = 3$$

$$P(t) = \frac{h_1 N_{1,3}(t) B_1 + h_2 N_{2,3}(t) B_2 + h_3 N_{3,3}(t) B_3}{h_1 N_{1,3}(t) + h_2 N_{2,3}(t) + h_3 N_{3,3}(t)}$$

A third-order rational Bézier curve

Convenient to assume $h_1 = h_3 = 1$

$$P(t) = \frac{N_{1,3}(t) B_1 + h_2 N_{2,3}(t) B_2 + N_{3,3}(t) B_3}{N_{1,3}(t) + h_2 N_{2,3}(t) + N_{3,3}(t)}$$