

$$N_{i,k}(t) = \frac{(t-x_i) N_{i,k-1}(t)}{x_{i+k-1} - x_i} + \frac{(x_{i+k} - t) N_{i+1,k-1}(t)}{x_{i+k} - x_{i+1}}$$

$K=2$

$$x = \begin{pmatrix} 0 & 1 & 2 & 3 & 4 & 5 & 6 \end{pmatrix}$$

$$0 < t < 1$$

$$N_{1,1}(t) = 1$$

$$N_{i,1}(t) = 0$$

$$i \neq 1$$

(84a)

$$N_{1,2}(t) = t$$

$$N_{i,2}(t) = 0$$

$$i \neq 1$$

$$N_{1,3}(t) = \frac{t^2}{2}$$

$$N_{i,3}(t) = 0$$

$$i \neq 1$$

$$1 < t < 2$$

$$N_{1,3}, 2, 3$$

$$N_{2,1}(t) = 1$$

$$N_{i,1}(t) = 0 \quad i \neq 2$$

$$N_{1,3}(t) = \frac{(t-0) N_{1,2}}{2-0} + \frac{(3-t) N_{2,2}}{3-1}$$

$$N_{1,2}(t) = \frac{(t-0) N_{1,1}}{1-0} + \frac{(2-t) N_{2,1}}{2-1}$$

$$N_{2,2}(t) = \frac{(t-1) N_{2,1}}{2-1} + \frac{(3-t) N_{3,1}}{3-2} = 0$$

$$= (t-1)$$

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$$N_{i,2}(t) = 0 \quad i \neq 1, 2$$

$$N_{1,3}(t) = \frac{t}{2}(2-t) + \frac{(3-t)}{2}(t-1)$$

$$N_{2,3}(t) = \frac{(t-1) N_{2,2}}{3-1} + \frac{(4-t) N_{3,2}}{4-3}$$

$$= \frac{(t-1)(t-1)}{2} = \frac{(t-1)^2}{2}$$

$$N_{i,1}(t) = \begin{cases} 1 & \text{if } x_i \leq t \leq x_{i+1} \\ 0 & \text{otherwise} \end{cases}$$

$$N_{i,k}(t) = \frac{(t - x_i) N_{i,k-1}(t)}{x_{i+k-1} - x_i} + \frac{(x_{i+k} - t) N_{i+1,k-1}(t)}{x_{i+k} - x_{i+1}}$$

$n=3$ $k=3$ $N_{i,3}(t)$ $i = 1, 2, 3, 4$ open knot vector

$$x_i = 0 \quad 1 \leq i \leq k$$

$$x_i = i - k \quad k+1 \leq i \leq n+1$$

$$x_i = n - k + i + 2 \quad n+2 \leq i \leq n+k+1$$

no. of knot values $n+1+k = 4+3=7$

$$X = [0 \ 0 \ 0 \ 1 \ 2 \ 2 \ 2] \quad 0 \leq t \leq 2$$

$$P(t) = N_{1,3} P_1 + N_{2,3} P_2 + N_{3,3} P_3 + N_{4,3} P_4$$

$0 \leq t < 1$

$$N_{3,1}(t) = 1$$

$$N_{i,1}(t) = 0 \quad i \neq 3$$

$$N_{1,2}(t) = \frac{(t-0) N_{1,1}}{0-0} + \frac{(1-t) N_{2,1}(t)}{1-0} = (1-t)^2$$

$$N_{1,2} = \frac{(t-0) N_{1,1}}{0-0} + \frac{(0-t) N_{2,1}}{0-0} = 0$$

$$N_{2,2} = \frac{(t-0) N_{2,1}}{0-0} + \frac{(1-t) N_{3,1}}{1-0} = (1-t)$$

$$N_{2,3}(t) = \frac{(t-0) N_{2,2}}{1-0} + \frac{(2-t) N_{3,2}}{2-0} = t(1-t) + \frac{(2-t)}{2} t$$

$$N_{3,2} = \frac{(t-0) N_{3,1}}{1-0} + \frac{(2-t) N_{4,1}}{2-0} = t$$

$$N_{3,3} = \frac{(t-0) N_{3,2}}{2-0} + \frac{(2-t) N_{4,2}}{2-0} = \frac{t+t}{2} = \frac{t^2}{2}$$

$$N_{4,2} = \frac{(t-1) N_{4,1}}{2-0} + \frac{(2-t) N_{5,1}}{2-0} = 0$$

$$1 \leq t \leq 2$$

$$N_{4,1}(t) = 1$$

$$N_{i,1}(t) = 0$$

$$i \neq 4$$

$$N_{1,3}(t) = \frac{(t-0) N_{1,2}}{0-0} = 0$$

$$N_{2,3}(t) = \frac{(t-0) N_{2,2}}{1-0} + \frac{(2-t) N_{3,2}}{2-0} = 0 + \frac{(2-t)}{2} (2-t) = \frac{(2-t)^2}{2}$$

$$N_{2,2} = \frac{(t-0) N_{2,1}}{1-0} + \frac{(1-t) N_{3,1}}{1-0} = 0 + 0 = 0$$

$$N_{3,2} = \frac{(t-0) N_{3,1}}{1-0} + \frac{(2-t) N_{4,1}}{2-1} = 0 + \frac{2-t}{1}$$

$$N_{3,3}(t) = \frac{(t-0) N_{3,2}}{2-0} + \frac{(2-t) N_{4,2}}{2-1} = \frac{t}{2} (2-t) + (2-t)(t-1)$$

$$N_{4,2}(t) = \frac{(t-1) N_{4,1}}{2-1} + \frac{(2-t) N_{5,1}}{2-2} = (t-1) + 0$$

$$N_{4,3}(t) = \frac{(t-1) N_{4,2}}{2-1} + \frac{(2-t) N_{5,2}}{2-2} = \frac{(t-1)(t-1)}{1} = (t-1)^2$$

$$N_{5,2}(t) = \frac{(t-2) N_{5,1}}{2-2} + \frac{(2-t) N_{6,1}}{2-2} = 0$$