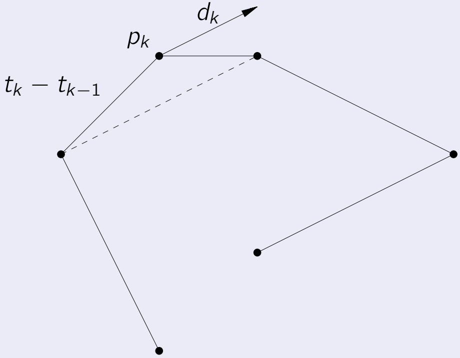
Interpolation

Points p_k and tangent vectors d_k (if provided) can be interpolated with a spline curve at parameter values t_k, using any of the interpolation methods for spline functions. The univariate schemes are applied separately in each component to determine the components of the parametrization $p = \sum_k c_k \, b_k$. Standard choices are cubic Hermite interpolation and cubic spline interpolation with not-a-knot, natural, or clamped boundary conditions.



If only points are given, knots τ_j, parameter values t_k, and tangent vectors d_k (if required) have to be determined based on the available information. Basic choices are

- $t_k - t_{k-1} = |p_k - p_{k-1}|$;
- $t_k = \tau_{k+\ell}$ with the shift ℓ depending on the labeling of the knots;
- $d_k = (p_{k+1} - p_{k-1})/(t_{k+1} - t_{k-1})$.

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More accurate derivative approximations employ local polynomial interpolation. The resulting formulas are used in particular at the endpoints of the parameter interval, where one-sided approximations are needed.