

## **A Class of Bézier-Like Splines in Smooth Monotone Interpolation**

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### **ABSTRACT**

We develop a new family of curves, the quartic and quintic Bézier-like curves, and investigate the use of these curves in smooth monotonicity preserving interpolation. These polynomial curves have, besides four control points, two additional parameters for shape control. The effect of the two parameters on the curve is analysed. Conditions on these parameters for the quartic and quintic Bézier-like curves to be monotonic are derived. Based on these conditions, a local  $C^1$  monotonicity preserving quartic Bézier-like spline interpolation scheme is presented. A  $C^2$  monotonicity preserving interpolation scheme is also developed where the optimal quintic Bézier-like spline interpolant is chosen through a constrained minimization of its mean curvature.

*Keywords: Bézier-like spline; Monotonicity preverving;  $C^1$  monotone interpolation;  $C^2$  monotone interpolation*