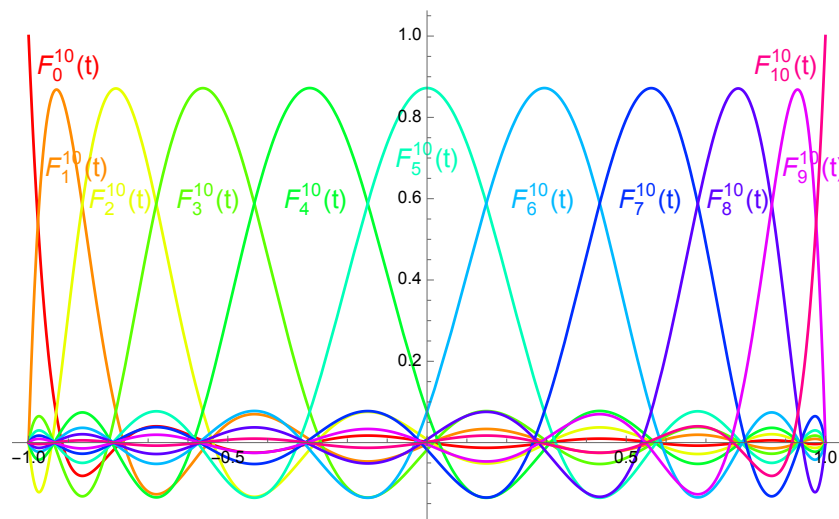


High-degree Polynomial Curve Design Using Hodograph Control Polygons

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According to the Weierstrass approximation theorem, all continuous curves can be approximated by polynomial curves with arbitrary accuracy. In practice it is very difficult to express a complicated shape as a single piece of a Bézier curve. This is due to the fact that the control polygon becomes very large compared to the curve as its degree increases. We introduce a curve design method using hodograph control polygons, where each edge specifies the derivative of the curve at the corresponding parameter value. Based on the Gauss-Legendre (GL) quadrature, the desired polynomial curve can be expressed as the barycentric combination of control points using GL polynomials as weights. Since the GL curves follow the shape of the hodograph control polygons better than Bézier curves, they have enough shape operability to be able to create complicated shapes as a single piece of a high-degree polynomial curve.



To ensure that the small buffet afterwards is properly sized, please send a short registration by e-mail to Ulrike Hörtnagl (ulrike.hoertnagl@uibk.ac.at) by March 27, 2025. If you forget, come anyway!