Fast evaluation of derivatives of Bézier curves

Filip Chudy[a,b,*], Paweł Woźny[a]

[a]*Institute of Computer Science, University of Wrocław, ul. Joliot-Curie 15, 50-383 Wrocław, Poland*
[b]*Department of Mathematics, University of Bologna, Piazza di Porta San Donato 5, 40126 Bologna, Italy*

Abstract

New geometric methods for fast evaluation of derivatives of polynomial and rational Bézier curves are proposed. They apply an algorithm for evaluating polynomial or rational Bézier curves, which was recently given by the authors. Numerical tests show that the new approach is more efficient than the methods which use the famous de Casteljau algorithm. The algorithms work well even for high-order derivatives of rational Bézier curves of high degrees.

Keywords: Bernstein polynomials, polynomial and rational Bézier curves, derivatives, de Casteljau algorithm, geometric algorithms.

---

[*]Corresponding author.
  Email addresses: `Filip.Chudy@cs.uni.wroc.pl` (Filip Chudy), `Pawel.Wozny@cs.uni.wroc.pl` (Paweł Woźny)