

A BRIEF REPORT ON THE ARTICLE "BERNSTEIN-BÉZIER FINITE ELEMENTS OF ARBITRARY ORDER AND OPTIMAL ASSEMBLY PROCEDURES"

ABDALLAH BRADJI

ABSTRACT. The authors derive finite element spaces by using the Bernstein-Bézier polynomials of arbitrary order. The features of the algorithms presented by the authors are applicable to nonlinear problems and do not rely on precomputed arrays containing values of one-dimensional basis functions at quadrature points. Numerous examples using Bernstein-Bézier polynomials are presented, e.g. prismatic Bernstein-Bézier finite element, quadrilateral Bernstein-Bézier finite element, and hexahedral Bernstein-Bézier finite element.

Last update: Friday 9th March, 2012. My hope I come back to the under review to learn more. 65N30

1. SOME BASIC KNOWLEDGE

1. some literature on Bernstein-Bézier polynomials [2, 3, 4]

REFERENCES

- [1] AINSWORTH, MARK; ANDRIAMARO, GAELLE; DAVYDOV, OLEG, "Bernstein-Bézier finite elements of arbitrary order and optimal assembly procedures" *SIAM J. Sci. Comput.*, 33, No. 6, 3087–3109 (2011).
- [2] FARIN, GERALD E., "Curves and Surfaces for Computer Aided Geometric Design: a Practical Guide. 4th ed." *Boston, MA: Academic Press*, (1997).
- [3] FOLEY, JAMES D.; VAN DAM, ANDRIES; FEINER, STEVEN; HUGHES, JOHN F., "Computer graphics. Principles and practice in C. 2nd ed." *Bonn: Addison Wesley Longman Publishers*, (1996).
- [4] HOSCHEK, JOSEF; LASSER, DIETER, "Fundamentals of Computer Aided Geometric Design. Translated from the German by Larry L. Schumaker." *Wellesley, MA: A. K. Peters.*, (1993).
- [5] LAI, MING-JUN; SCHUMAKER, LARRY L., "Spline functions on triangulations." *Encyclopedia of Mathematics and Its Applications 110. Cambridge: Cambridge University Press*, (2007).

DEPARTMENT OF MATHEMATICS, UNIVERSITY OF ANNABA-ALGERIA

E-mail address: bradji@cmi.univ-mrs.fr

URL: <http://www.cmi.univ-mrs.fr/~bradji/>