BEZIER BLENDING SURFACES ON ELLIPSE

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The Bezier surfaces play an important role in geometric modelling due their shape preserving properties. In this paper we construct Bezier surfaces with the properties that the surfaces stay on a ellipse (the border of the surfaces domain) and have a fixed height in the center of the domain. We obtain surfaces of blending type (the Coons surfaces [1]): the surfaces are generated using a curves network (one of the curves is reduced to a point), instead of the control points from the case of classical Bezier surfaces. We study the monotonicity and we give conditions to obtain concave surfaces using the first and second order directional derivatives respective (like in [2]). Also we get the surfaces of hyperbolic, parabolic or elliptic type.

REFERENCES

[1] S. A. Coons, *Surface for computer aided design of space forms*, Project MAC, Design Div., Dep. of Mech. Engineering, MIT, 1964.

[2] M. S. Floater, *Shape Properties of Tensor-Product Bernstein Polynomials*, in Shape Preserving Representations in Computer-Aided Geometric Design, J. M. Pena (Ed.), Nova Science Publications, New York, 1999, pp. 149-162.