

Comparing Bézier Surfaces for Coincidence

Krassimira Vlachkova

*Faculty of Mathematics and Informatics, Sofia University “St. Kliment Ohridski”
5, J. Bourchier Blvd, 1164 Sofia, Bulgaria
krassivl@fmi.uni-sofia.bg*

Keywords: Bézier surface, coincident surfaces

It is known that Bézier curves and surfaces may have multiple representations by different control polygons. The polygons may have different number of control points and may even be disjoint. This phenomenon causes difficulties in variety of applications where it is important to recognize cases where different representations define same curve (surface) or partially coincident curves (surfaces). Up to our knowledge, Pekerman et al. [1] were the first to address the problem of testing two parametric polynomial curves for coincidence. Their approach is based on reduction of the input curves to canonical irreducible forms. An alternative geometric approach for Bézier curves was proposed in [2]. In the same paper it was shown that this approach can be applied to tensor product Bézier surfaces under certain conditions. Here we propose a solution to the general case.

References

- [1] Pekerman, D., Seong, J.-K., Elber, G., Kim, M.-S.: *Are two curves the same?*. Computer-Aided Design and Applications, Vol. 2, Issue 1-4, 2005, pp. 85-94
- [2] Vlachkova, K.: *Comparing Bézier curves and surfaces for coincidence*. In: Advanced Computing in Industrial Mathematics, Studies in Computational Intelligence, K. Georgiev, M. Todorov and I. Georgiev (eds.), Vol. 681, Springer, 2017, pp. 239-250.