6th International Conference on Applied Informatics Eger, Hungary, January 27–31, 2004.

Parametrization and Implizitization Using Symbolic-Numeric Techniques

Ibolya Szilagyi

A4232, Schloss Hagenberg, Hagenberg i.M., Austria Email: szibolya@risc.uni-linz.ac.at

Abstract

Cubic surfaces arise in many applications in CAD/CAM. They occure in two ways, either as the zero set of an algebraic equation of degree 3 (implicit representation), or as the image of a map given by polynomials (parametric representation). It is important to be able to pass back and forth between the two representations. It has been observed that one can use the configuration of the 27 lines on this surface in order to do the parametrization.

In this talk, we report on current research on these conversion problems, especially from numerical point of view. We present a numerically stabil algorithm based on the paper of Berry and Patterson, which solves the conversion problems for nonsingular cubic surfaces.

This is joint research with J. Schicho.

References

 T. G. Berry, R. R. Patterson, Implicitization and parametrization of nonsingular cubic surfaces, CAGD, Vol. 18, pp. 723-738, 2001.