

PIECEWISE RATIONAL APPROXIMATIONS OF REAL ALGEBRAIC CURVES

收稿日期 1994-12-23 修回日期 网络版发布日期 接受日期

摘要

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Abstract We use a combination of both algebraic and numerical techniques to construct a C^1 -continuous, piecewise (m,n) rational ϵ -approximation of a real algebraic plane curve of degree d .

At singular points

we use the classical Weierstrass Preparation Theorem and Newton power series factorizations, based on the technique of Hensel lifting.

These, together with modified rational Pad ϵ approximations, are used to efficiently construct locally approximate, rational parametric representations for all real branches of an algebraic plane curve.

Besides singular points we obtain an adaptive selection of simple points about which the curve approximations yield a small number of pieces yet achieve C^1 continuity between pieces. The simpler cases of C^{-1} and C^0 continuity are also handled in a similar manner.

The computation of singularity, the approximation error bounds and details of the implementation of these algorithms are also provided.

Key words

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