

*Numerical Affine Lower Bound for Polynomials over Simplices
with Applications*

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We investigate the problem of finding tight affine lower bounding functions for multivariate polynomials over a given simplex. These functions are obtained by using the expansion of the given polynomials into Bernstein form. Convergence forms to polynomials are given with respect to raising the degree and number of subdivision steps. We present a method for constructing linear affine lower bounding functions for multivariate polynomial functions based on the control points, the convex hull of Bernstein control points and degree elevation. Convergence forms and Monotonicity of the minimum error bounds are investigated. finally, application to global optimization and stability of control polynomial functions is addressed.