

## Bezier curves based numerical solutions of delay systems with inverse time

### ABSTRACT

This paper applied, for the first time, the Bernstein's approximation on delay differential equations and delay systems with inverse delay that models these problems. The direct algorithm is given for solving this problem. The delay function and inverse time function are expanded by the Bézier curves. The Bézier curves are chosen as piecewise polynomials of degree  $n$ , and the Bézier curves are determined on any subinterval by  $n+1$  control points. The approximated solution of delay systems containing inverse time is derived. To validate accuracy of the present algorithm, some examples are solved.

**Keyword:** Delay differential equations; Bézier curves; Delay systems