

# Approximation Of Time-Delay Systems

Al-Amer, SH; Al-Sunni, FM

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King Fahd University of Petroleum & Minerals

<http://www.kfupm.edu.sa>

## Summary

We propose a new method for approximating time-delays in dynamical systems. A weighted  $H_2$ -infinity norm criterion is minimized to obtain rational approximation of  $e^{-sd}$ . We report the approximation in a diagram relating both the amount of time delay and the bandwidth to the order of the approximating rational function for a given level of infinity norm. The obtained approximations are compared to the widely used Fade's approximation. Examples are used for illustrations.

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