Interpolation and Extrapolation of Functions defined by a Cauchy Problem with Applications to Ecological Modeling

Nduminso Archibald Pete and Igor Fedotov
Department of Mathematics and Statistics
Tshwane University of Technology
Pretoria, South Africa
petean@tut.ac.za, fedotovi@tut.up.ac.za

Inherent in the classical approach to function approximation are the limitations placed on the scope of choice for functions of approximation.In this paper a novel method that allows us to approximate functions by means of linear combinations of polynomials, trigonometric and exponential functions, polynomials and periodic functions among others, is presented. This technique uses, on a fixed interval, an initial value linear ordinary differential equation for function approximation and the approximation expressions are obtained in a closed form.