

Numerical Solution of the Inverse ODE's Problem

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In this talk we consider the inverse problems for ordinary differential equations in the following context: given a function $x(t)$, find a vector field $f(x, t)$ such that the problem

$$\begin{cases} x' = f(x, t) & t_0 < t < T \\ x(t_0) = x_0 \end{cases}$$

admits $x(t)$ as an exact or approximate solution, where f is restricted to a certain class of functions (Verscay et al). In recent years affine and quadratic functions are examined by researchers. The purpose of present work is to extend the same idea to a wider class of functions, for example, cubic or quartic functions, and prepare an environment for more accurate approximations.