Analytical Solutions for Systems of Fredholm IDEs by Using Modified Taylor's Optimization

Abstract: In this work, a numerical approach based on the modified Taylor's technique for derive the analytical approximate solutions is applied for systems of Fredholm integro-differential equations. The solution is calculated in the form of a rapidly convergent series with easily computable components using symbolic computation software. The results obtained depend on Taylor's series expansions and they reproduce to the exact solutions when the solutions are polynomials. Numerical examples are presented and discussed quantitatively to illustrate the method. The results show the potentiality, the generality, and the superiority of our algorithm for solving such systems.

Keywords: Integro-differential equations, Taylor's series expansions, Numerical solutions, Fredholm type.

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