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## **Abstract**

In this paper, we formulate a numerical method to find out the approximate solution for fractional integro-differential equations of variable order (FIDE-VO). The methodology that adopted here is converting the FIDE-VO problem into a system of ordinary differential equations and that has been transformed into a system of algebraic equations in the unknown coefficients. For this purpose, the shifted Vieta–Fibonacci polynomials will be used for constructing both new fractional variable-order operational matrices of differentiation and integration. The variable order operators of differentiation and integration will be used in the Caputo and Riemann–Liouville senses, respectively. The Tau method and the constructed operational matrices will be used at the collocation points for transforming the FIDE-VO into an algebraic system of equations that will be solved numerically. At the end, the applicability and accuracy of the recommended method will be demonstrated through some numerical applications.