National Institute of Technology Rourkela

Progress Seminar

Seminar Title	: Wavelet Technique for solving Multidimensional Optimal Control Problems with Conformable Fractional-Order Derivatives
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Venue	: Department Seminar Room
Date and Time	: 03 Apr 2025 (10:00)
Abstract	: This report rigorously presents a formulation and analytical solution technique for the optimal control problem. We confidently introduce Mittag-Leffler wavelets and have developed a novel conformable fractional integral operator for these functions. We address the free final end-point conditions comprehensively. The properties of the operational matrix are effectively reflected in the numerical method process, directly enhancing the accuracy of the proposed method. The optimized solution is decisively derived using the Lagrange multiplier method applied to the resulting system of equations. Furthermore, this report conducts a thorough examination of the convergence properties of our approach, establishing clear error bounds that quantify its accuracy. To validate our formulation and solution scheme, we present compelling numerical examples.