



CONSTRUCTION OF FUNCTIONS FOR FRACTIONAL DERIVATIVES USING MATLAB

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Authors' contributions

This work was carried out in collaboration between both authors. Author OAS designed the study and wrote the first draft of the manuscript, author JFL carried out the MATLAB coding and edited the entire work. Both authors read and approved the final manuscript.

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Abstract

MATLAB is a high level programming tool for technical computing, its application cuts across different sphere of science, engineering, finance, communication, music etc. With the current increase in the use of non-integer order derivatives, there is a need to have tools that handle them for effective applications. In this paper, we present a brief comparative review of 2 expressions of fractional derivative. MATLAB functions for approximating Riemann-Liouville and Caputo fractional derivatives are presented alongside. Numerical simulations with test examples are implemented and results compared. To effectively handle non-polynomial function, Taylor series expansion is employed to convert the function into a form that can be easily handled.

Keywords: MATLAB; fractional derivative; caputo derivative; riemann liouville derivative.

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