

# Numerical methods for fractional-derivative problems

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## Short Description

At present the numerical solution of problems involving fractional- order derivatives is a “hot” research area; a search of the MathSciNet database using MSC Primary = 65 (numerical analysis) and Anywhere = “fractional derivative” yields 778 papers for the period 2018–2023. Numerical analysts are interested in this topic because fractional derivatives are increasingly used in modelling applications and they are sufficiently different from classical integer-order derivatives so as to require new numerical methods; furthermore, the error analysis of these new methods can be challenging. There is substantial research activity in all types of numerical methods (finite differences, finite elements, spectral methods, . . .) for discretising fractional-derivative differential equations. This research area is still developing rapidly, and it is therefore desirable to have a minisymposium where recent results can be presented to the large audience expected at ENUMATH 2023.

The organisers (E.Sousa and M.Stynes) have extensive experience in numerical methods for fractional derivatives – Sousa’s first paper on this topic appeared in 2009 and Stynes’ 2017 fractional-derivative paper in SIAM J. Numer. Anal. has 288 citations in MathSciNet.