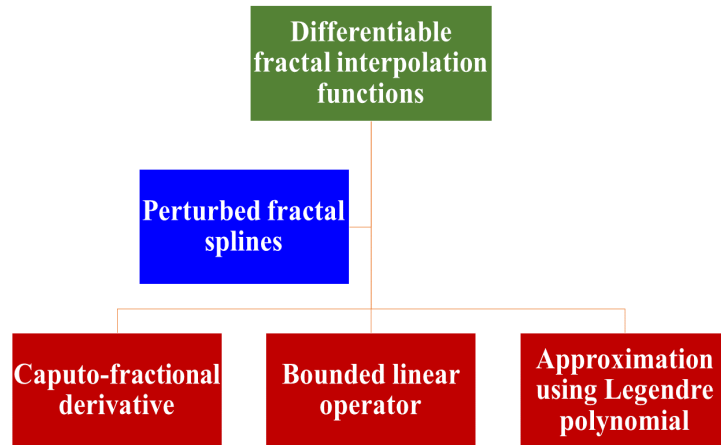


Parameter Identification Of Perturbed Fractal Splines And Its Caputo-Fractional Derivative

Graphical abstract



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Project Description

The fractal interpolation functions are introduced as a new idea for approximating/interpolating the non-differentiable functions, especially showing self-similarity in their traces. As a generalization to non-differentiable fractal functions, fractal splines (differentiable fractal functions) are also constructed. Though fractal splines exist in the literature, their fractional calculus have not been discussed so far despite the study of fractional calculus of non-differentiable fractal functions. Hence, to bridge this research gap, the present proposal has targeted to investigate the fractional derivative of the fractal splines.

The Caputo fractional derivative distinguishes from the other fractional derivative methods with the demand for the existence of first order derivative of given function. This attribute leads to the investigation of Caputo fractional derivative of α -fractal splines and a bounded linear operator corresponding to the fractional derivative is reported. In addition, a new family of fractal perturbations is proposed in association with the fractional derivative.

Products/ Instruments/ Results/ Outreach Activities (Pictures)

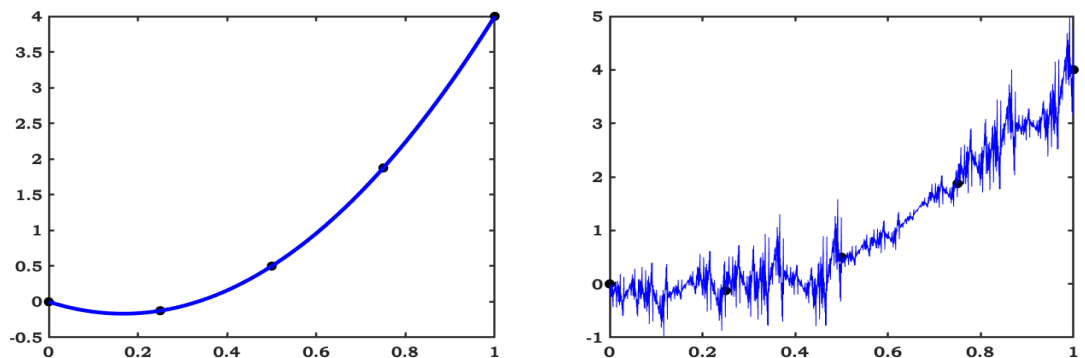


Fig. Graphical illustrations of (a) α -fractal interpolant, (b) C^1 - α -fractal approximant

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Duration of the Project (years)

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