Solving The 2D Advection-Diffusion Equation Using Fixed-Depth Symbolic Regression And Symbolic Differentiation Without Expression Trees

This paper presents a novel method for solving the 2D advection-diffusion equation using fixed-depth symbolic regression and symbolic differentiation without expression trees. The method is applied to two cases with distinct velocity fields and initial- and boundary-condition constraints. This framework offers a promising, scalable solution for finding approximate solutions to differential equations, with the potential for future improvements in computational performance and applicability to more complex systems involving vector-valued objectives.

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