

Fitness Function Evaluation using Fractional Calculus

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Abstract

This paper proposes a Genetic Algorithm (GA) for the synthesis of combinational logic circuits. The fitness function evaluation is calculated using Fractional Calculus. This new concept extends the classical fitness function by introducing a fractional-order dynamical evaluation. The dynamic fitness function results from an analogy with control systems where it is possible to benefit the proportional algorithm by including a differential component. The experiments reveal superior results when comparing with the classical fitness method.

Keywords: Fractional Calculus; Genetic Algorithms; Digital Circuits;

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