

# Analog Circuit Implementation of Fractional Order Damped Sine and Cosine Functions

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**Abstract:** This paper introduces for the first time analog circuit implementations of two fundamental linear fractional order systems whose impulse responses called fractional order damped sine and cosine functions are the inverse Laplace transform of their irrational transfer functions. These analog circuit implementations are derived through rational function approximations of their irrational transfer functions.

**Keywords :** Analog circuit, fractional order differential equation, fractional order system, irrational function, rational function.