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Particle Swarm Optimization of Bollinger Bands

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Abstract

The use of technical indicators to derive stock trading signals is a foundation of financial technical analysis. Many of these indicators have several parameters which creates a difficult optimization problem given the highly non-linear and non-stationary nature of a financial time-series. This study investigates a popular financial indicator, Bollinger Bands, and the fine tuning of its parameters via particle swarm optimization under 4 different fitness functions: profitability, Sharpe ratio, Sortino ratio and accuracy. The experiment results show that the parameters optimized through PSO using the profitability fitness function produced superior out-of-sample trading results which includes transaction costs when compared to the default parameters.

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