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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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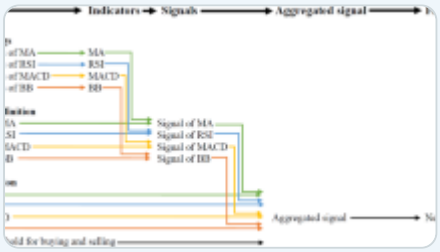

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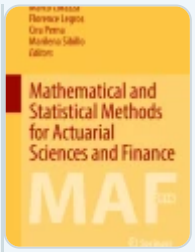

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References

1. Lee, J.S., Lee, S., Chang, S., Ahn, B.H.: A comparison of ga and pso for excess return evaluation in stock markets. In: Mira, J., Álvarez, J.R. (eds.) IWINAC 2005, Part II. LNCS, vol. 3562, pp. 221–230. Springer, Heidelberg (2005)

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2. Lento, C., Gradojevic, N.: The profitability of technical trading rules: a combined signal approach. Journal of Applied Business Research 23(1), 13–27 (2007)

Google Scholar

3. Lento, C., Gradojevic, N., Wright, C.: Investment information content in

Bollinger Bands? Applied Financial Economics Letters 3(4), 263–267 (2007)

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4. Leung, J., Chong, T.: An empirical comparison of moving average envelopes and Bollinger Bands. Applied Economics Letters 10(6), 339–341 (2003)

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5. Moody, J., Wu, L., Liao, Y., Saffell, M.: Performance functions and reinforcement learning for trading systems and portfolios. Applied Financial Economics Letters 17, 441–470 (1998)

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6. Shi, Y., Eberhart, R.: A modified particle swarm optimizer. In: Proceedings of the 1998 IEEE International Conference on Evolutionary Computation, IEEE World Congress on Computional Intelligence, pp. 69–73 (1998)

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7. Williams, O.: Empirical Optimization of Bollinger Bands for Profitability. Master's thesis, Simon Fraser University (2006)

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