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Combining Monte Carlo Filters with Support Vector Machines for Option Price Forecasting

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Abstract

This study proposes a hybrid model for online forecasting of option prices. The hybrid predictor combines a Monte Carlo filter with a support vector machine. The Monte Carlo filter (MCF) is used to infer the latent volatility and discount rate of the Black-Scholes model, and makes a subsequent prediction. The support vector machine is employed to capture the nonlinear residuals between the actual option prices and the MCF predictions. Taking the option transaction data on the Taiwan composite stock index, this study examined the forecasting accuracy of the proposed model. The performance of the hybrid model is superior to traditional extended Kalman filter models and pure SVM forecasts. The results can help investors to control and hedge their risks.