Symbolic Interval-Valued Data Analysis for Time Series Based on Auto-interval-regressive Models

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Abstract: This study considers interval-valued time series data. To characterize interval time series data, we propose an auto-interval-regressive (AIR) model using the order statistics from normal distributions. Furthermore, to better capture heteroscedasticity in volatility, we designate a heteroscedastic volatility auto-interval-regressive (HVAIR) model. We derive the likelihood functions of the AIR and HVAIR models to obtain the maximum likelihood estimator. Monte Carlo simulations are then conducted to evaluate our methods of estimation and conrm their validity. A real data example from the S&P 500 Index is used to demonstrate our method.