

ABSTRACT

HYBRID OF FUZZY C-MEANS IN AND HEURISTIC METHOD STOCK PRICE FORECASTING USING TYPE 2 FUZZY TIME SERIES

By

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Fuzzy Time Series (FTS) Type 2 is known to have a good ability to handle uncertainty in time series data. Type 2 FTS is a development of Chen's Type 1 model by using operations to refine fuzzy relations and utilising more information from time series data to produce accurate forecasting results. In forecasting, the interval length in the universe of speech is important because it can affect the level of accuracy. Also, the fluctuating pattern of stock movements is an important factor to consider. Therefore, this study proposes using a combination of heuristic and Fuzzy C-Means (FCM) models in FTS Type 2 to forecast stock prices. This research uses FCM to group data into clusters and form intervals and heuristic models to improve the performance of the Fuzzy Logical Relationships Group (FLRG) by utilising increase and decrease trends. In the Type 2 forecasting stage, a comparison was made between two averaging methods, namely arithmetic and geometric averages. The results show that the proposed model is able to improve accuracy and has excellent forecasting results. This is shown by the MAPE and RMSE efficiency of the model using heuristics is more efficient by 15.34% and 21.25% compared to the model without heuristics. Therefore, it can be said that the combination of FCM and heuristic method in FTS Type 2 provides better results and is effective in forecasting stock prices and is useful in decision making, especially in the financial field.

Keywords: Heuristic model, fuzzy c-means, fuzzy time series, type 2 fuzzy time series.