**Literature on AUTOMATED TRADING SYSTEMS ON FINANCIAL MARKET STABILITY**

The way in which financial markets operate has substantially been changed by the development of information technology. Automation of trading systems in financial markets represents the last phase of depersonalizing activities previously done by traders. Automated trading development enabled computers to determine the moment and the way of executing sales orders. Computers still do not make autonomous decisions regarding the choice of instruments to be traded or trading criteria. They implement the strategy a trader has decided on, choosing a favourable moment. This reduces the impact of human emotions on decision making and enables overcoming possible problems which arise due to neglect or lack of concentration. High-frequency trading enables the execution of algorithmic operations at a high speed.( University of Kragujevac, Faculty of Economics, Kragujevac, Serbia)

**Literature on Encoding Candlesticks as Images for Patterns Classiﬁcation using GASF-CNN Approach**

Making predictions on stock and currency market using computerized systems has been rapidly developing area with the advancement of deep neural networks. Many researches have been carried out on this field to develop a fully automated system to read stock market like humans. Since the stock market is based on time series data, generating timeseries patterns and recognising the patterns is much popular in stock market analysis. The conversion of time series data in to reasonable data types and recognizing the hidden patterns inside these data is done in automated trading. A proposed methodology by a set of researchers shows an approach to conversion of time series data in to images and recognition of candlestick patterns using Convolutional Neural Networks. Candlestick charts display the high, low, open and closing prices for a speciﬁc time series. Candlestick patterns emerge because human actions and reactions are patterned and continuously replicate and captured in the formation of the candles. According to Thomas Bulkowskis Encyclopedia of Candlestick Charts, there are 103 candlestick patterns. The researcher has selected 8 major candle stick patterns for recognition. Instead of converting time series data directly in to pixels they have used the Gramian angular field(**gramian** ) to convert time series data in to images. They have found that this particular encoding method can significantly improve the performance of the neural network in the two-dimensional convolution time series.

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