Applying Machine Learning to predict the realized volatility of various financial assets

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The realized volatility (RV) has gained in importance in recent years due to its ability to serve as a good approximation of the true market volatility. This finding provoked many researchers, including us, to deliver good forecasts for the RV and to find a working financial application of these predictions. The focus of our work lies on building a ML model, that could deliver better forecasts for calculating the Value-At- Risk than the well-known and established models in this field. We make use of the popular linear heterogenous autoregressive model (HAR) and various architectures of recurrent neural networks. Within the framework of this work, we consider different periods of time for training our models, which contributes for investigating the capability of each of the proposed approaches to predict accurately in times with different price fluctuation on the financial markets. Furthermore, the sequence length in the training data set is varied, this helps for benchmarking the ability of the models to learn patterns from different amounts of historical data. The results demonstrate superiority of the nonlinear models while this is more obvious for the recurrent neural networks in low volatility times with larger training data set. This outcome makes us curious to deepen our research about the financial application of the predictions.