

Application of machine learning algorithms to high frequency trading

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Abstract

Disruptive powers of applied mathematics and computer science are changing many industries, including financial industry. One example is application of machine learning algorithms in the field of high frequency trading which aims in introducing predictive power into stochastic environment thus securing even more investments and leveraging portfolio risks. Current traditional approaches in price prediction which rely on domain experts knowledge and human traders, not that rarely, tend to lack in speed and reliability. Therefore, in order to address this issue, we introduced approach presented in this paper, that is based on automated process that incorporates data gathering, data transformation, training predictive model and generating predictions that later facilitate making financial investments.

In the process of mitigating high dimensionality problem within our approach we compared Support Vector Machine and Boosting Classifiers since they tend to be more robust in such case. As a result, Gradient Boosting proved to be faster in learning and superior in performance leading to prediction results comparable to other research efforts. Presented approach was tested but it is not limited to data obtained from Google Finance service.

Keywords: Supervised machine learning, High frequency trading , Feature engineering, Support Vector Machine, Gradient Boosting, AdaBoost