An Automated guided model for merging news into Stock Trading Strategies

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Abstract: The proposed automated model represents merging news into stock trading strategies using genetic programming. Events are reterived from news in free text. The introduced model can be tested by deriving trading strategies based on technical indicators and impacts of extracted events. The trading strategies take the form of system that combine technical indicators with a news variable and revealed through the use of genetic programming. The news variable contains in the best trading policy, indicating the added value of news for predictive purposes and validating our proposed model for automatically merging news in stock trading strategies.

Keywords: Technical indicator, Historical data, Genetic Programming, Optimal Trading Strategies

1. Introduction

Financial markets are driven by information. Stock market prediction is popular subject in the area of finance. Due to business growth, it has attracted often aid from educator to economics sector. It is impossible to give the prediction of prices of stock market because of stock prices are changed continually every second. Market stock prediction has ever been a subject of curiosity for most investors and business analyst. In today's information driven area more persons try to maintain record up-to-date with the present progress by reading informative news items on the internet. The content of news items shows past, current, and upcoming circumstances and thus news contains valuable information for different reasons. Being aware of ongoing marketplace situations is of paramount importance for investors and traders, who require to creating knowing decisions that could have an evidentiary impact on definite aspects specified as profits and marketplace perspective. It requires to do automatically mining news items by means of computers that would alleviate effort that are required for manually processing of news messages.

In this First, present previous work on the relationship between news and the stock market, and the type of events that are proven to influence stock prices. Next, provide an quantitative investigation of the relationship between news messages and the stock market. later, take the technical indicators that use for deriving stock trading strategies. After that introduce model for automated trading based on news results of validating the framework.

2. Literature Review

Jethro Borsje, Frederik Hogenboom and Flavius Frasincar[2] establish lexico-semantic patterns and lexico-syntactic patterns process for mining of financial event from RSS news feeds. Jordy Sangers, Wouter IJntema [3] makes the use of text rule based method that uses lexico semantic pattern for learning ontology instances from text that helps domain experts for maintaining ontology population process. G.F. Knolmayer and M.A. Mittermayer [4] applied several prototypes for predicting the short-term market reaction to news based on text mining techniques. Prototype build up by Wthrich et al. Cho99[5], ChWZ99[6], WCLP98][7]. This prototype tries to guess the 1-day trend of five major equity indices such as the Dow Jones, the Nikkei, the FTSE, the Hang Seng, and the Straits Times. The Prototype build up by Lavrenko et al.

3. Proposed System

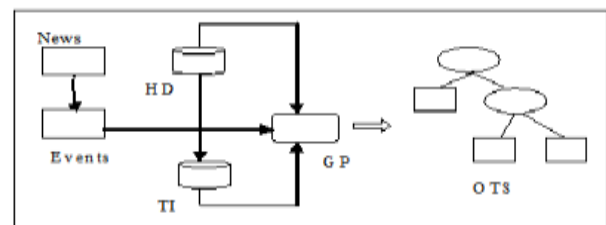### 3.1 Architecture of Proposed system

Fig 1. Architecture of Proposed System

The above fig1. Shows architecture of proposed system for merging news in stock trading strategies. The model assumes that events have been mined from news articles and are available together with the date on which the events took

place. Additionally, already defined impact should be allocated to each event, allowing the news message to be added in the trading strategies. Technical trading indicators used in trading strategies generated through genetic programming. The indicators consist the simple moving average (SMA), the Bollinger band (BB), the exponential moving average (EMA), the rate of change (RoC), momentum (MOM), and moving average convergence divergence (MACD).The alternative for these indicators is depend on their widespread use in technical trading .For finding the optimal trading strategies, by using genetic programming. Genetic programming is a method where the possible solutions are presented as computer programs instead of numerical values encoded some other way. Initializing from starting population, genetic programs try to improve the fitness of individuals over consecutive generations through a method inspired by normal evolution. During this course individuals are altered, usually depend on their fitness values, by merging them with other individuals called crossover, or by slightly changing some parts of the individual with a already defined probability called mutation. The used genetic programming algorithm for determining the optimal trading strategies is presented in below Algorithm.1. The algorithm start from a random initial population of trees, and create new populations of trading strategies by applying crossover and mutation on the population from the preceding iteration. Crossover contains choosing two trading strategies, and finding two random crossover points. after that the subtrees created under the crossover point are swapped between the two trading strategies, therefore resulting in two new rules that are inserted to the new population. Mutation relates to the technical indicators included in a trading strategy, and consists of a slight change in the parameters of the arbitrarily selected technical indicator. The ending condition for the algorithm relates to the enhancement in the best solution found, thus when the optimal solution cannot be improved in a number of generations, the algorithm ends.

Genetic Algorithm :

Requirements:

$a \geq 0$: minimum improvement

$b > 0$: maximum times of no improvement

$c > 0$: population size

$0 < d \leq e$: number of parents

$0 \leq f \leq 1$: mutation probability

1: $g = generateRandomPopulation(\gamma)$

2:$hold = -\infty$, hnew = calcFitness(g), i = 0

3: while i < b do

4: addIndividual(g′, getBest(g, hnew))

5: while |g′| < |g| do

6: $\theta = selectRandomParents(g, hnew, \rho)$

7: $\vartheta = crossOver(\theta)$

8: $\vartheta' = mutate(\vartheta, f)$

9: addIndividual(g′, ϑ')

10: end while

11: g = g′, hold =hnew, hnew = calcFitness(g)

12: if hnew − hold ≤ a then

13: i = i + 1

14: else if i > 0 then

15: i = 0

16: end if

17: end while

18: return g

4. Conclusion

The presented model is merging news into stock trading strategies. The trading strategies that consider may include any number of technical trading indicators. The news variable is quantified based on the events extracted from the news articles and the assignment of an expert defined impact to each of these events. The selected technical indicator are also tested and the individual performance of each indicator is reported. Additionally combination of individual technical indicators and the news variable are investigated. Lastly genetic program is used to discover complex trading rules based on technical indicators and news based messages.

5. References

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