Algorithmic Trading: Evolution of Algorithmic Trading

April 23, 2019

Tomer Solel is a Financial Analyst at I Know First. He graduated from Cal Poly Pomona with a bachelor's degree in applied mathematics.

Algorithmic Trading Evolution To Artificial Intelligence And Machine Learning

Summary

- The two methods used for algotrading are high-frequency and quantitative trading.
- The steps in understating machine learning include providing the framework, giving examples to learn from, fitness function, sequential, and generalization requirement. Everyone wants to report results as accurate as possible and as fast as possible.
- A genetic algorithm is another type of algorithm. The steps in a genetic algorithm include combination, mutation, crossover, and selection; hence the name "genetic algorithm".
- Our algorithm predicts over 10,000 markets in 6 different time horizons for short and long term for stocks, commodities, ETF's, interest rates, currencies, and world indices.
- The I Know First daily market heat map includes signal and predictability for different stocks, and recently, in a swing trading report, the I Know First Algorithm Performance crushed the S&P 500's performance.

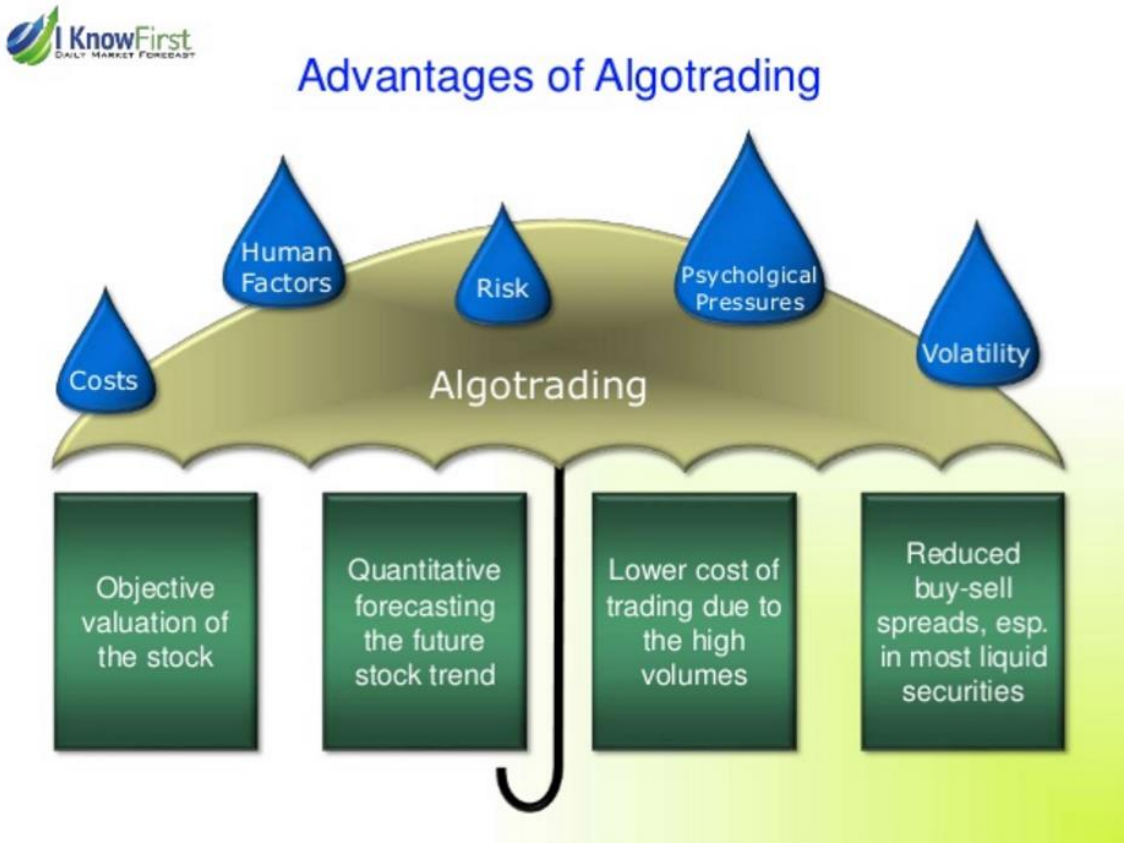
Introduction

I Know First is a financial startup that provides a daily investment foresight based on a predictive advanced self-learning algorithm. It was founded by Dr. Lipa Roitman, and its current CEO is Mr. Yaron Golgher. The algorithm is based on artificial intelligence and machine learning that incorporates neural networks and genetic algorithms, helping it to predict over 10,000 markets on a daily basis.

Methods of Algotrading

The two methods of algotrading are high-frequency and quantitative trading. High-frequency trading uses the intelligence that goes down to milliseconds. What it does is it places and quickly cancels small orders to find the right price at which trading can

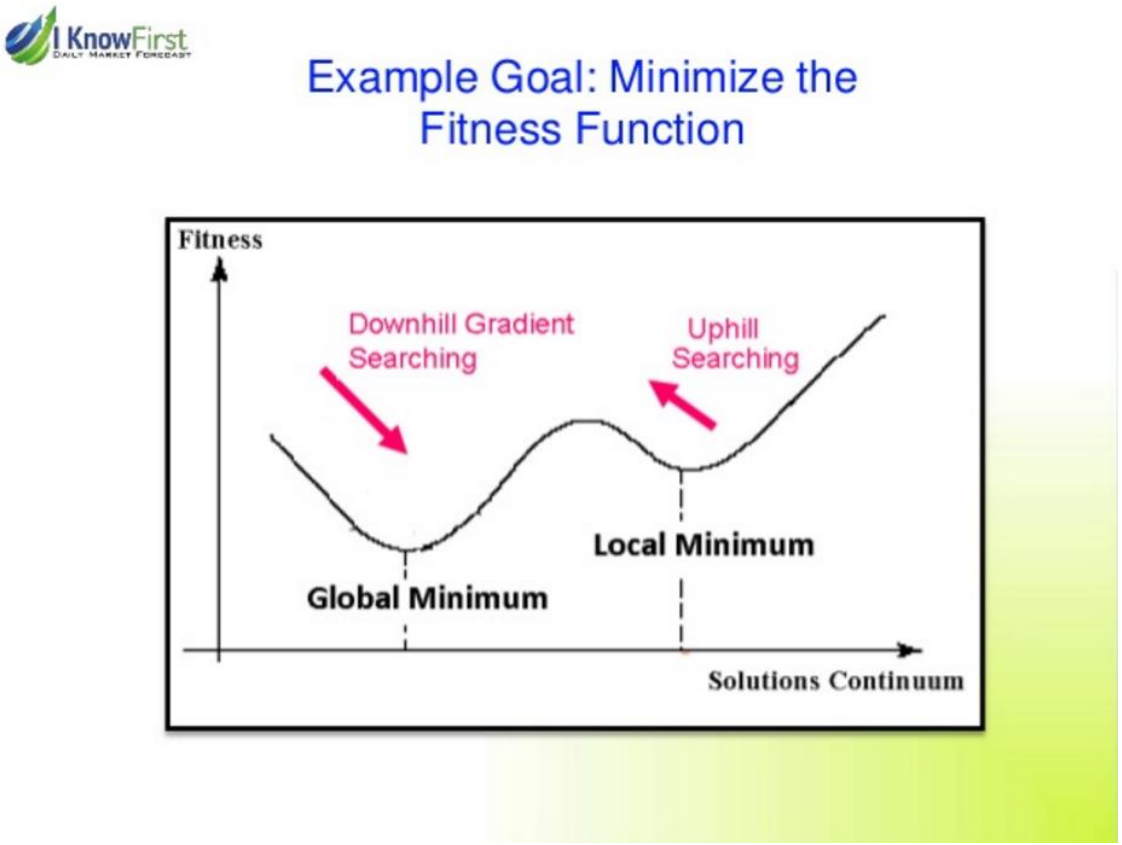
happen, and to detect trends. A human simply cannot compete with the volume of information that this real-time intelligence goes through. The problem with this high-frequency trading is that its technological costs are enormous and that there is a high competition but a low profit. In addition, governments are clamping down on this method because it is unfair to the retail investor, since the high-frequency trading traders have the first choice in the trade, leading to the ban of the method in some places in Europe and Canada. The other method of algotrading is quantitative trading. In this method, algorithms analyze the structure of the market and its trends to find predictable patterns and to trade upon that. This method is suitable for most investors. Overall, both algotrading methods have pros and cons.



Machine Learning

The most important thing in stock market prediction is speed. An example is the Dow Jones, which in 2008 came out with an advertising campaign which claimed that their

service had beaten other news services by 2 seconds in reporting an interest rate cut by the Bank of England. To achieve that fast speed, we need to understand what the steps of machine learning are. The first step is providing framework using mathematical tools and programming tools. The next step is to give examples to learn from using inputs and outputs. The ensuing step is to make a fitness function, with an example being to make more good predictions than bad ones. The next step is the sequential step, and the final step is the generalization requirement which is critical for the forecasting ability; it is the step where we discover the laws connecting the input and output, cause and effect.



There are different artificial intelligence types. Deep learning models high-level abstractions in data by using multiple processing layers with complex structures. Ultra-deep learning detects the change in paradigms. It combines supervised and unsupervised AI into a more intelligent system. There are many steps in machine learning. The first is to provide framework using mathematical and programming tools. The second step is to prepare data by converting nonstationary data into stationary data.

The next step is to make an estimation regarding the number of parameters. Then finally, you can build the model, and pick your algorithm. We need to find the local and global minima. The local occurs at the steepest descent while the global appears searching uphill. This artificial intelligence approach is in the root of the I Know First predictive algorithm.

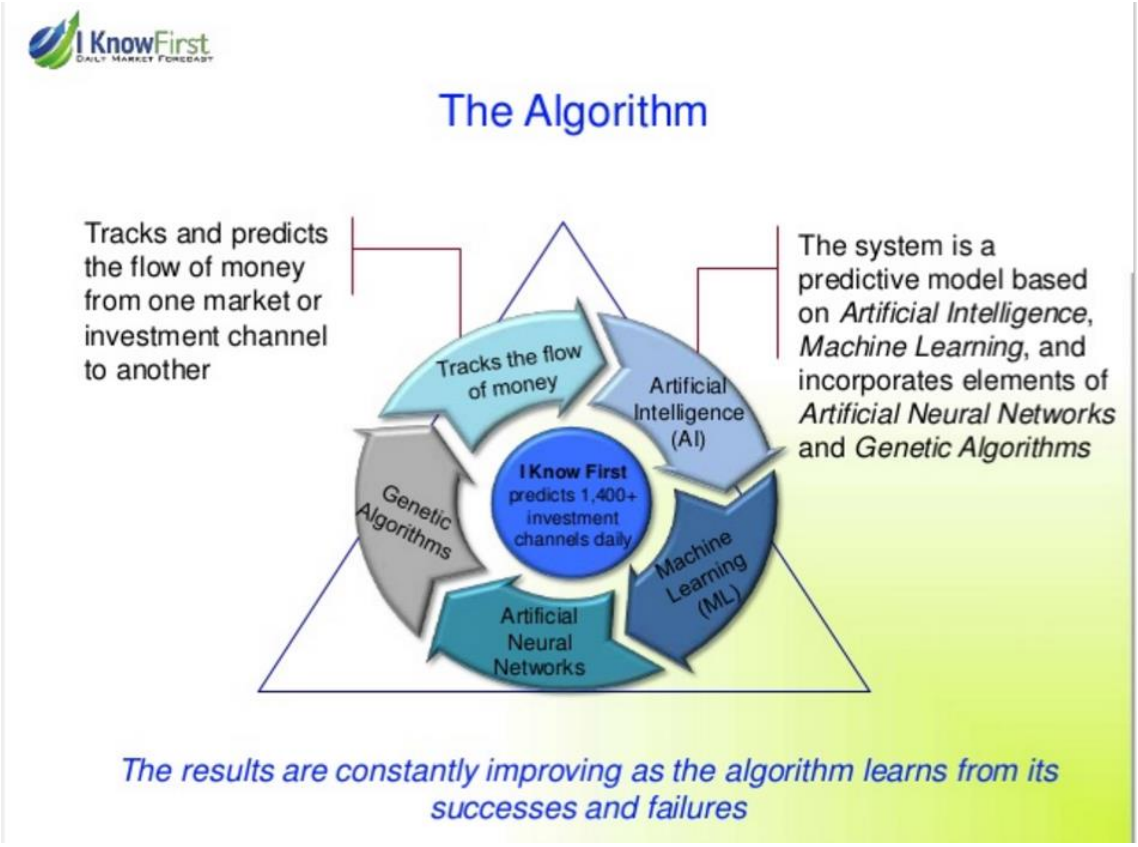
Genetic Algorithms

Another example of an algorithm is a genetic algorithm. This type is a search algorithm. It is used for the most difficult problems, where there might be unknown relationships or there might not be any relationships at all. The reason behind the name is that each solution is like a chromosome in genetics. The genetic algorithm uses different ways to improve the gene pool. One way is the combination, where two solutions are combined in hopes of producing a better solution. Another way is mutation where a solution is modified in random places in hopes of producing a better solution. A different way is a crossover, which imports a solution from a similar problem, and the last way is selection, where those who are the fittest survive.

I Know First Algorithm Features

As previously mentioned, the I Know First algorithm analyzes, models, and predicts over 10,000 markets for the short and long term. Those markets include stocks, commodities, ETF's, interest rates, currencies, and world indices. The I Know First client base has also been growing and now includes larger institutions, hedge funds, family offices,

investment managers, financial advisors, and professional investors. We want to try to predict market trends. To retain and attract investors, a firm should be able to beat the S&P 500. Those investors face challenges. That's because, customers expect strong and consistent returns, even though in reality the market is evolving beyond previously established theories. Also, investment firms need to stay one step ahead in order to be the first to recognize trends and take advantage of opportunities. They are looking for the most advanced tools to enhance their performance. The I Know First algorithm tries to use all of those tools when it makes its predictions.



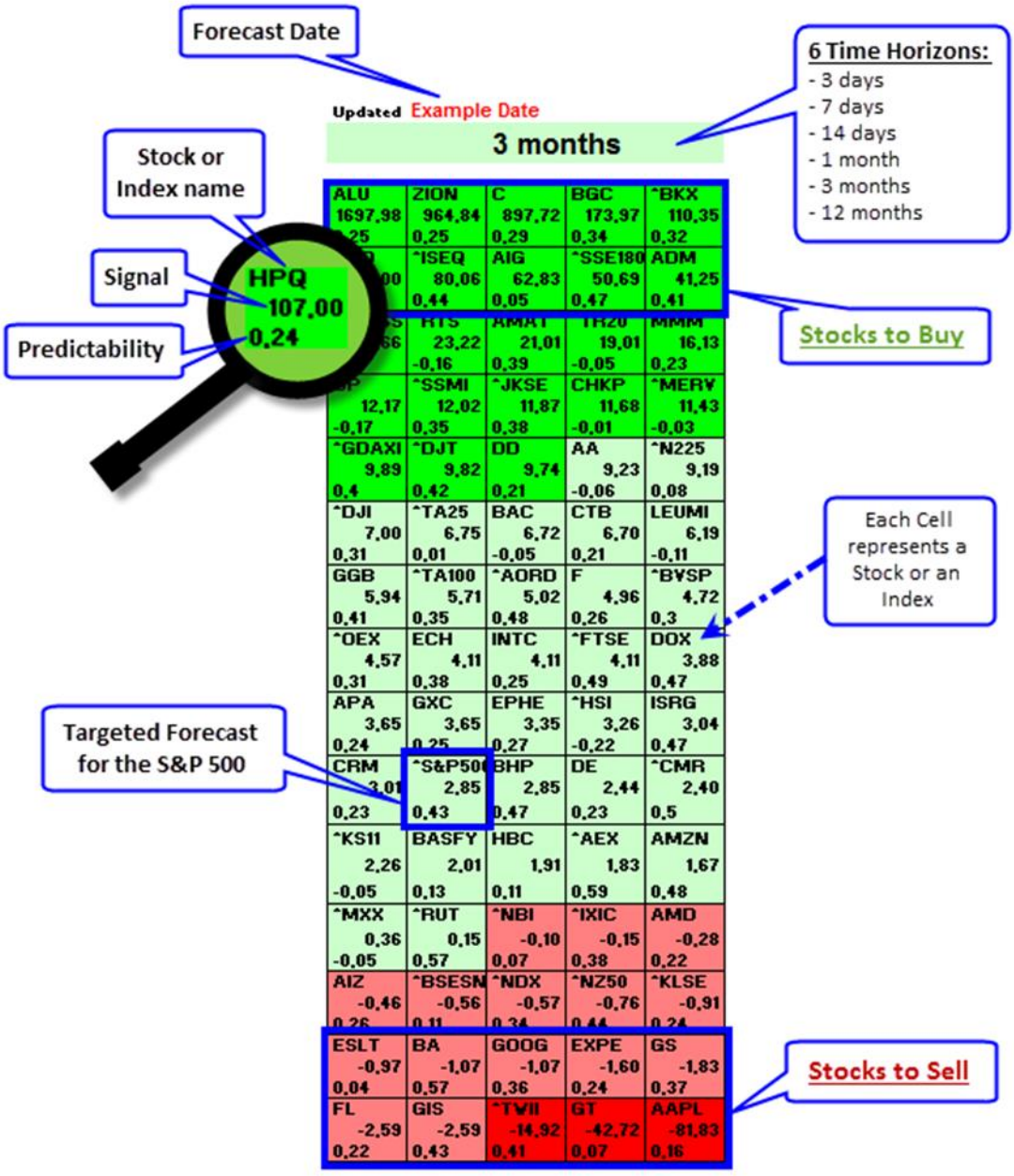
Daily Heat Map

The I Know First algorithm produces a daily market heat map. That market includes two indicators. The first is the signal which is the predicted movement of the asset, and the second is the predictability indicator which is a historical correlation between the prediction and the actual market movement.

I KnowFirst
DAILY MARKET FORECAST

Forecast Table Description

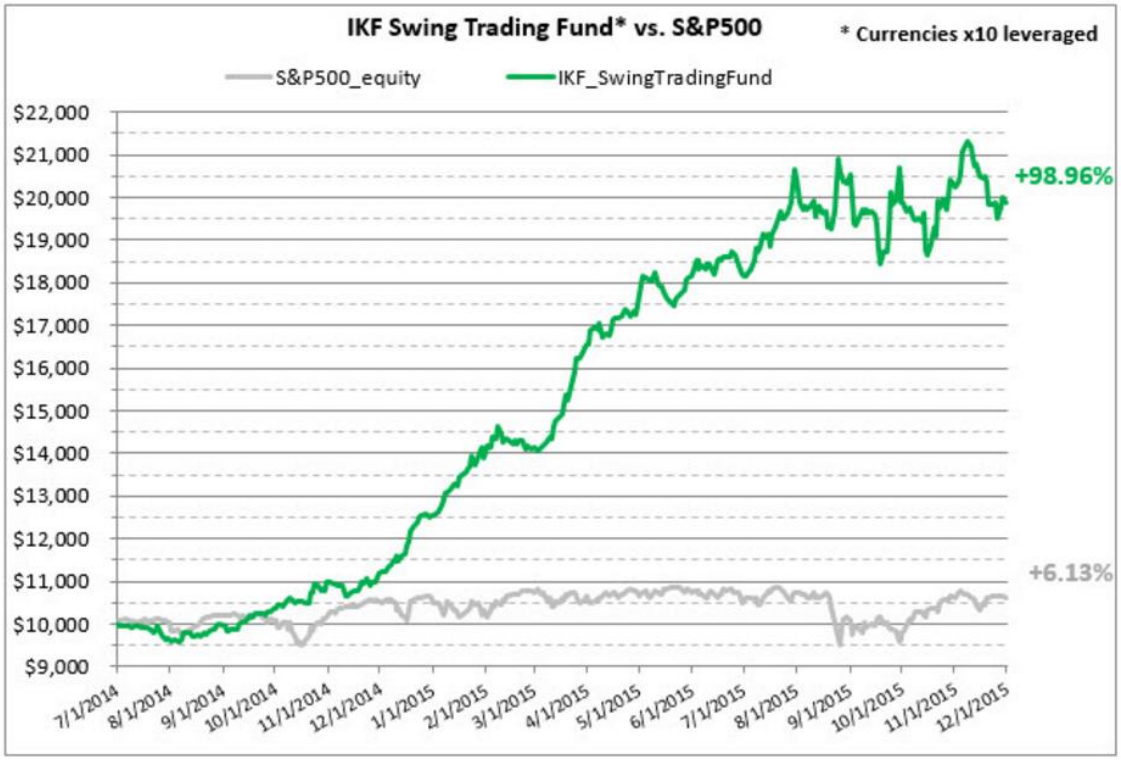
I KnowFirst
DAILY MARKET FORECAST



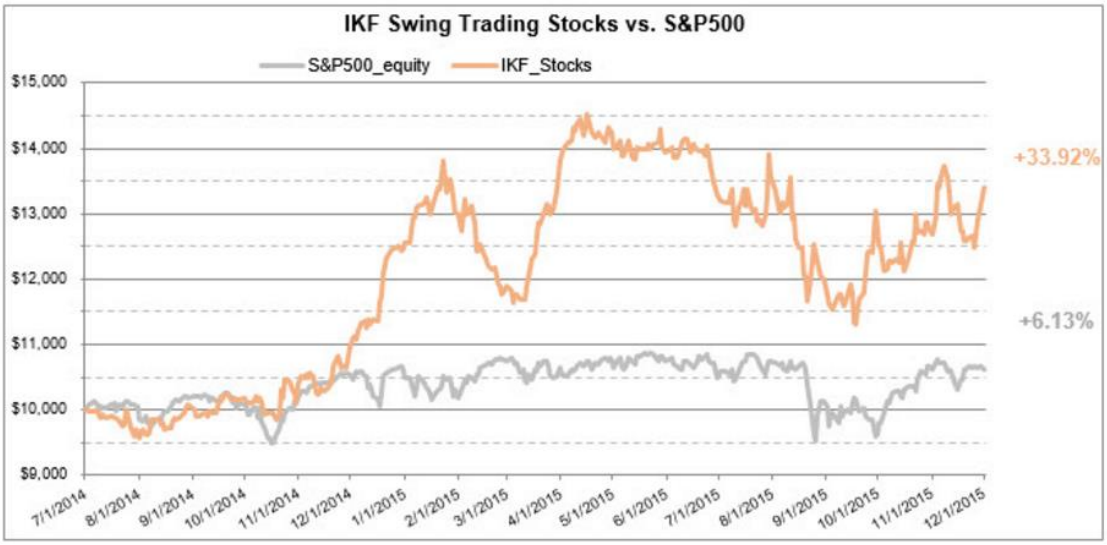
ALU 1697.98	ZION 964.84 0.25	C 897.72 0.29	BGC 173.97 0.34	^BKX 110.35 0.32
	^ISEQ 80.06 0.44	AIG 62.83 0.05	^SSE180 50.69 0.47	ADM 41.25 0.41
	RTS 23.22 -0.16	AMAT 21.01 0.39	TH20 19.01 -0.05	MMM 16.13 0.23
12.17 -0.17	^SSMI 12.02 0.35	^JKSE 11.87 0.38	CHKP 11.68 -0.01	^MERV 11.43 -0.03
^GDAXI 9.89 0.4	^DJT 9.82 0.42	DD 9.74 0.21	AA 9.23 -0.06	^N225 9.19 0.08
^DJI 7.00 0.31	^TA25 6.75 0.01	BAC 6.72 -0.05	CTB 6.70 0.21	LEUMI 6.19 -0.11
GGB 5.94 0.41	^TA100 5.71 0.35	^AORD 5.02 0.48	F 4.96 0.26	^BVSP 4.72 0.3
^OEX 4.57 0.31	ECH 4.11 0.38	INTC 4.11 0.25	^FTSE 4.11 0.49	DOX 3.88 0.47
APA 3.65 0.24	GXC 3.65 0.25	EPHE 3.35 0.27	^HSI 3.26 -0.22	ISRG 3.04 0.47
CRM 3.01 0.23	^S&P500 2.85 0.43	BHP 2.85 0.47	DE 2.44 0.23	^CMR 2.40 0.5
^KS11 2.26 -0.05	BASFY 2.01 0.13	HBC 1.91 0.11	^AEX 1.83 0.59	AMZN 1.67 0.48
^MXX 0.36 -0.05	^RUT 0.15 0.57	^NBI -0.10 0.07	^IXIC -0.15 0.38	AMD -0.28 0.22
AIZ -0.46 0.26	^BSESN -0.56 0.11	^NDX -0.57 0.34	^NZ50 -0.76 0.44	^KLSE -0.91 0.24
ESLT -0.97 0.04	BA -1.07 0.57	GOOG -1.07 0.36	EXPE -1.60 0.24	GS -1.83 0.37
FL -2.59 0.22	GIS -2.59 0.43	^TWII -14.92 0.41	GT -42.72 0.07	AAPL -81.83 0.16

IST Co., Ltd.

Recently, I Know First published a swing trading report, detailing the overall performance of the algorithm for this successful strategy. From July 1st, 2014 until November 30th, 2015, the I Know First algorithm returned 98.96% while the S&P 500 increased by just 6.13% during the same period. That is an astonishing 92.83% difference.



Looking at the individual development of, I Know First returned 33.92% using its top contributors, outperforming the S&P 500 by 26.79% in that aspect.



Conclusion

The main features of the algorithm that make it so reliable are that it works daily, in 6-time frames, tracks over 3,000 markets, is self-learning, adaptable, and most importantly it becomes more and more accurate with every prediction as it constantly tests multiple models in different market circumstances. This algorithm offers predictions for aggressive investors as well as conservative investors. This heat map also provides different colors to give investors the exact strength of each prediction. The I Know First algorithm also has a proven track record of constantly beating the S&P 500. The use of algorithms is the future of financial analysis.

PREMIUM