

[Inspiratron.org](https://inspiratron.org) - [Natural language processing, machine learning and cybersecurity](#)

FinAnalyzer - Tool for financial analysis of stocks

by Nikola Milošević - Monday, May 02, 2016

<https://inspiratron.org/blog/2016/05/02/finalyzer-tool-financial-analysis-stocks/>

For a while I was playing with financial data and financial data mining. I have already written about it in a [separate post](#). Now, I decided to try to make my research so far accessible a bit more, so people can use it. Basically, what I previously did is that I used a bunch of technical financial parameters, such as price, P/E ratio, Price to Sales, Price to Book and many other ratios to try to create a model that will be able to predict a stock price movement over the long term (1 year period). It seems that it is working for about 75% of times using machine learning, namely Random Forests algorithm. For more details you can read my [paper](#) about it. But this is research and it was made as Weka model, that I did not publish so far. That needs to change.

I decided to make a Java desktop application using Spring framework that will perform the analysis, show available indicators, news and recommendation. However, I am not to be liable for any damage or loss made by the recommendation engine. It can be wrong and it should not be the only thing you will make your investment decision since it is more tool that I made in spare time than any serious financial investment recommender system.

I used data available from Yahoo! Finance, its ["hidden" API](#) (for financial indicators and ratios) and RSS feed (for news). The user basically needs to enter the symbol of the stock and the application will show him available indicators and ratios as well as the most current news. By clicking on news, they will be fully open in a browser. Machine analyst will use indicators and ratios to predict whether the stock will grow at least 10% or not over the period of next year. This prediction will be shown at the bottom of the window as Buy for the stocks that will grow and Sell for the ones that won't. Here is how it all looks:

Inspiratron's FinAnalyzer

Stock symbol to check:

Indicator	Value	Article title	Date published	URL
Name	Apple Inc.	Action Alerts PLUS: Apple Gets Bruised, and So Does the ...	Sun, 01 May 201...	http://us.r...
Symbol	aapl	[\$\$] Investors wary despite US earnings beating forecasts	Sun, 01 May 201...	http://us.r...
Stock Exchange	NMS	Facebook's Oculus Rift Won't be the iPhone of Virtual Reality	Sun, 01 May 201...	http://us.r...
Market Capitalization (Millio...	519750.0	April Brings Relief For Some Hedge Funds	Sun, 01 May 201...	http://us.r...
Ask	93.72	Sunday links: supposedly sophisticated people	Sun, 01 May 201...	http://us.r...
Bid	93.56	5 Companies That Destroyed Shareholders Last Week	Sun, 01 May 201...	http://us.r...
Average Day Volume	38961200	Apple's Outlook: Requiem for Your Money?	Sun, 01 May 201...	http://us.r...
Book Value	23.13	Why Apple Analysts Are Getting More and More Cautious Ab...	Sun, 01 May 201...	http://us.r...
P/E Ratio	9.98	Weekly roundup: Apple's brutal shift Twitter's har...	Sun, 01 May 201...	http://us.r...
P/E Ratio RT	N/A	Galaxy S7 Edge Review: Samsung's Frustrating Futuristic ...	Sun, 01 May 201...	http://us.r...
Earnings Per Share	9.40	Apple Stock: Analyzing 5 Key Customers (AAPL)	Sun, 01 May 201...	http://us.r...
Price/Book ratio	4.10	Malicious: China Unplugs Apple And Disney	Sun, 01 May 201...	http://us.r...
Price/Sales ratio	2.24	Did Carl Icahn Sell Apple Due To China Or For Another Rea...	Sun, 01 May 201...	http://us.r...
Dividend Yield	2.40	Hungry rivals are eating into the Apple Watch business	Sun, 01 May 201...	http://us.r...
Price Change RT	-1.09	Faraday Future's business partner wants to dominate Silic...	Sat, 30 Apr 2016...	http://us.r...
Price Change Percent	N/A	John Sculley's plans for changing the world 'again'	Sat, 30 Apr 2016...	http://us.r...
50-day moving average	93.99	Apple Inc.'s R&D Spending Continues to Shoot Higher	Sat, 30 Apr 2016...	http://us.r...

Machine learning analyst says: **Buy**

I have to state that over the Yahoo Finance API, I could not retrieve all the indicators I used in my [paper](#). Since some were not available, I needed to create a new model using the same data. I used only 8 ratios and indicators to make my model and according to Weka, a Random Forest model that is used by FinAnalyzer is performing slightly worse than the model from my paper. This model tested only on the past data using 10-fold cross validation performed with F-score, precision and recall around 71%. Which I believe is still quite good.

Software is available on GitHub and also 3 functions for collecting data, news and predicting can be used as a library. Further documentation about technical details can be found there. If you have any questions, don't hesitate to contact me. GitHub page is <https://github.com/nikolamilosevic86/FinAnalyzer>

Also, I might grow the tool to the full scale open source project for financial analysis. If you are interested in contributing, let me know.