Stock Market Prediction by RNN on LSTM Model

Deqing Qu, Mian Xie

Background

Multi-Factor Model is a financial model that employs multiple factors to explain market phenomena and stock prices

- **Macroeconomic factors**: employment, inflation, interest
- **Fundamental factors**: Revenue, Gross Margin, Net Income, Earning Per Share (EPS),
- **Statistical factors**: Stock Price, Trading Volume

Problem Description

- Construct a Multi-Factor Model using LSTM to predict the stock price
- Generate portfolios with hedging strategy to achieve higher excess return and lower risk of volatility.

Dataset

- Stock Statistical Data from **Yahoo! Financial**

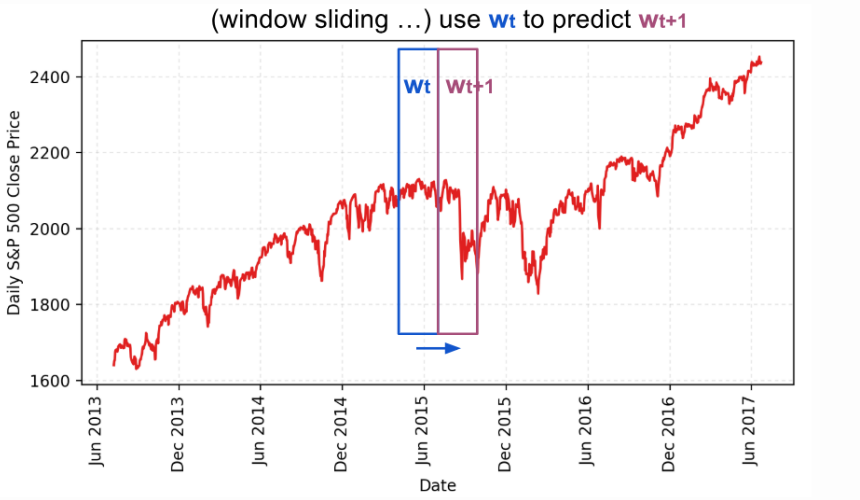
Date	Open	High	Low	Close*	Adj Close**	Volume
Feb 19, 2019	1,110.00	1,121.89	1,110.00	1,118.56	1,118.56	1,046,400
Feb 15, 2019	1,130.08	1,131.67	1,110.65	1,113.65	1,113.65	1,449,800
Feb 14, 2019	1,118.05	1,128.23	1,110.44	1,121.67	1,121.67	947,600
Feb 13, 2019	1,124.99	1,134.73	1,118.50	1,120.16	1,120.16	1,049,800
Feb 12, 2019	1,106.80	1,125.30	1,105.85	1,121.37	1,121.37	1,609,100
Feb 11, 2019	1,096.95	1,105.94	1,092.86	1,095.01	1,095.01	1,065,200

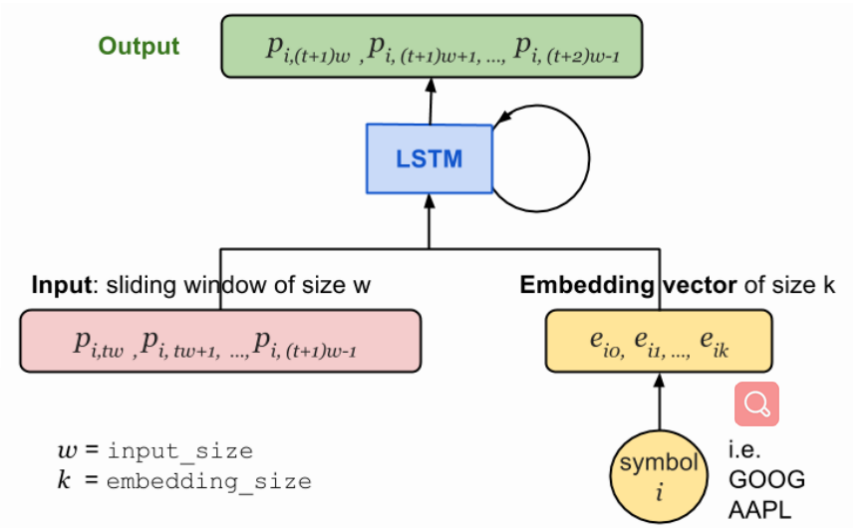
Dataset

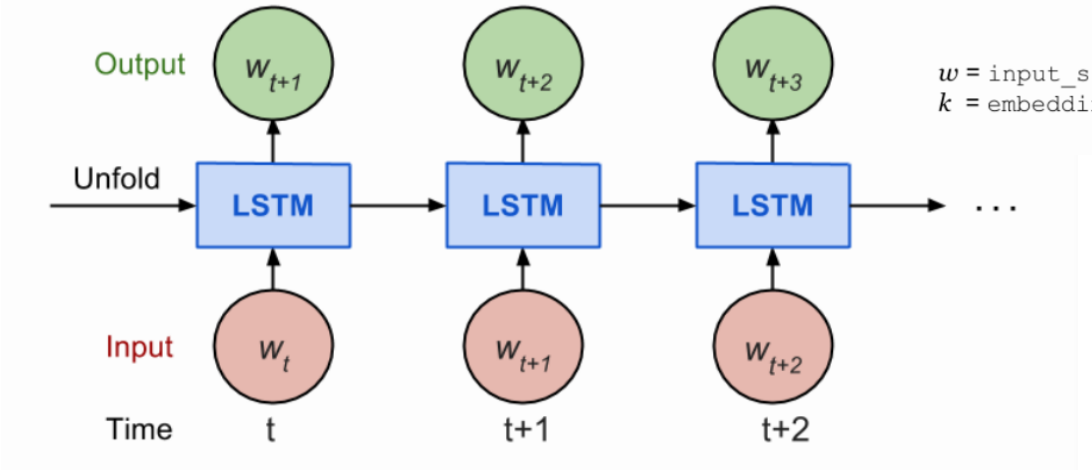
- Fundamental Data from **Morningstar API**
  - Revenue, Net Income, Gross Margin, EPS ...
  - Return on Asset, Return on Equity ...

	2009-12	2010-12	2011-12	2012-12	2013-12	2014-12	2015-12	2016-12	2017-12	2018-12
Revenue (USD Mil)	23,651	29,321	37,905	50,175	59,825	66,001	74,989	90,272	110,855	136,819
Gross Margin (%)	62.6	64.5	65.2	58.9	56.8	61.1	62.4	61.1	58.9	56.5
Operating Income (USD Mil)	8,312	10,381	11,742	12,760	13,966	16,496	19,360	23,716	28,882	31,392
Operating Margin (%)	35.1	35.4	31	25.4	23.3	25	25.8	26.3	26.1	22.9
Net Income (USD Mil)	6,520	8,505	9,737	10,737	12,920	14,444	16,348	19,478	12,662	30,736
Earnings Per Share (USD)	10.21	13.17	14.89	16.16	18.79	20.57	22.84	27.85	18	43.7

Some Current Stock Prediction ways...

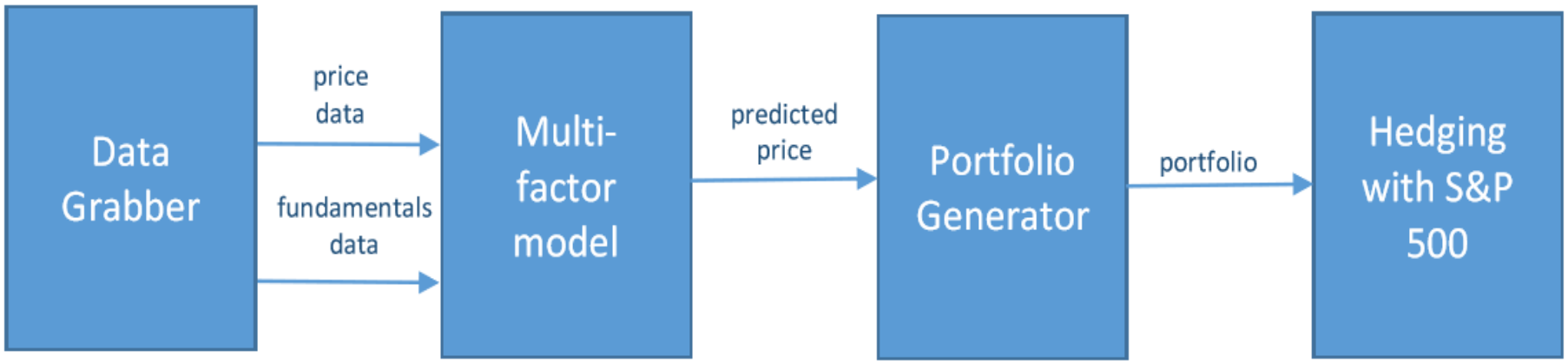






Our Stock Prediction System...

Data Flow Chart:



Q & A