주가/블록체인 예측을 위한 네트워크

V2017110 김병준
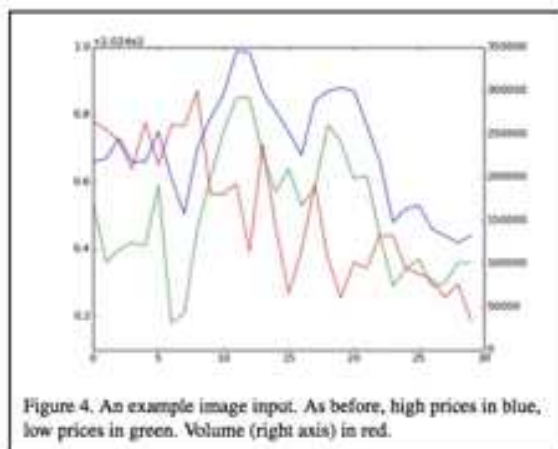
❖ Input Data

Column Name	Meaning
DATE	Time (which minute of the day)
CLOSE	Closing price (price at the end of the minute)
HIGH	High price (maximum price during the minute)
LOW	Low price (minimum price during the minute)
OPEN	Opening price (price at the beginning of the minute)
VOLUME	How many contracts were offered to be bought/sold in the minute

Table 1. Minute–by–minute data provided by [1]

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	date_id	datetime_id	market	rpt_key	last	diff_24h	diff_per_24h	bid	ask	low	high	volume	created_at	updated_at
2	31/05/2017	##########	bitstamp	btc_eur	1996.72	2029.99	-1.6389243	2005.5	2005.56	1950	2063.73	2314.50075	##########	##########
3	31/05/2017	##########	bitflyer	btc_jpy	267098	269649	-0.9460447	267124	267267	267124	267267	70922.8801	##########	##########
4	31/05/2017	##########	korbit	btc_krw	3003500	3140000	-4.3471338	3003500	3004000	3002000	3209500	6109.75287	##########	##########
5	31/05/2017	##########	bitstamp	btc_usd	2237.4	2239.37	-0.0879712	2233.09	2237.4	2154.28	2293.46	13681.282	##########	##########
6	31/05/2017	##########	okcoin	btc_usd	2318.82	2228.7	4.04361287	2319.4	2319.99	2129.78	2318.82	4241.64152	##########	##########
7	31/05/2017	##########	korbit	etc_krw	22740	23150	-1.7710583	22700	22730	21000	25500	855853.37	##########	##########
8	31/05/2017	##########	bitflyer	eth_btc	0.1034	0.08855	16.7701863	0.10915	0.1034	0.10915	0.1034	21670.567	##########	##########
9	31/05/2017	##########	korbit	eth_krw	311800	274500	13.5883424	311800	311950	272500	336000	327416.949	##########	##########
10	31/05/2017	##########	bitflyer	fx_btc_jpy	266600	275066	-3.0778068	266276	266640	266276	266640	70921.7271	##########	##########
11	31/05/2017	##########	okcoin	ltc_usd	25.42	24.931	1.9614135	25.364	25.42	23.2	25.514	171028.35	##########	##########
12	31/05/2017	##########	korbit	etc_krw	22740	23010	-1.1734029	22700	22730	21000	25500	855853.37	##########	##########
13	31/05/2017	##########	korbit	eth_krw	311900	272500	14.4587156	311900	311950	273000	336000	326531.243	##########	##########
14	01/06/2017	##########	bitstamp	btc_eur	2005.56	2013.41	-0.3898858	2005.56	2006.01	1950	2063.73	2317.21965	##########	##########
15	01/06/2017	##########	bitflyer	btc_jpy	268271	269440	-0.4338628	268271	268300	268271	268300	71179.5208	##########	##########
16	01/06/2017	##########	korbit	btc_krw	3003500	3140000	-4.3471338	3003500	3004000	3002000	3209500	6116.84208	##########	##########
17	01/06/2017	##########	bitstamp	btc_usd	2248.39	2242.44	0.26533597	2247.77	2248.38	2154.28	2293.46	13701.6986	##########	##########
18	01/06/2017	##########	okcoin	btc_usd	2320.42	2228.4	4.12942021	2320.99	2321.49	2129.78	2322	4260.26152	##########	##########
19	01/06/2017	##########	bitflyer	eth_btc	0.1034	0.08813	17.3266765	0.10915	0.1034	0.10915	0.1034	21524.4153	##########	##########
20	01/06/2017	##########	bitflyer	fx_btc_jpy	268000	275064	-2.5681296	267858	268000	267858	268000	71179.5208	##########	##########
21	01/06/2017	##########	okcoin	ltc_usd	25.505	25.003	2.00775907	25.437	25.505	23.2	25.514	171285.683	##########	##########
22	01/06/2017	##########	bitstamp	btc_eur	2014.99	2016.7	-0.084792	2014.9	2014.99	1950	2063.73	2330.30475	##########	##########
23	01/06/2017	##########	bitflyer	btc_jpy	268750	269507	-0.2808832	268295	268500	268295	268500	71668.0919	##########	##########
24	01/06/2017	##########	korbit	btc_krw	3017000	3159000	-4.4950934	3017000	3004000	3002000	3209500	6126.34296	##########	##########
25	01/06/2017	##########	bitstamp	btc_usd	2248.35	2238.58	0.43643738	2248.35	2248.69	2154.28	2293.46	13742.1109	##########	##########
26	01/06/2017	##########	okcoin	btc_usd	2323.5	2229.99	4.19329235	2323.5	2323.51	2129.78	2323.5	4263.03152	##########	##########
27	01/06/2017	##########	korbit	etc_krw	22700	23000	-1.3043478	22700	22730	21000	25500	848605.961	##########	##########
28	01/06/2017	##########	bitflyer	eth_btc	0.1034	0.088	17.5	0.10915	0.1034	0.10915	0.1034	21376.2655	##########	##########
29	01/06/2017	##########	korbit	eth_krw	311950	275000	13.4363636	311650	311950	274000	336000	326480.64	##########	##########

INPUT

Figure 4. An example image input. As before, high prices in blue, low prices in green. Volume (right axis) in red.

R : Volume
G : High
B : Low

(t - 30) ~ t 까지의 데이터
그래프로 변환

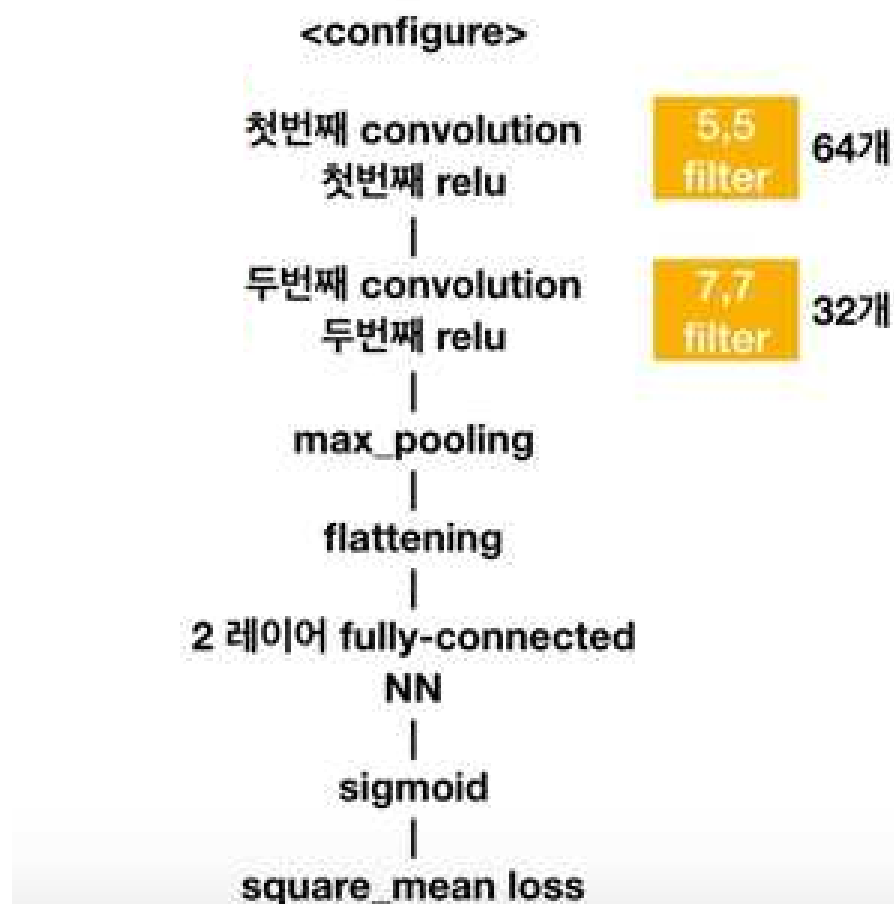논문에서는 size=32*54   channel=4(RGBA)
이미지 사용

CNN

그래프 개형에서 feature 를 잡아내자
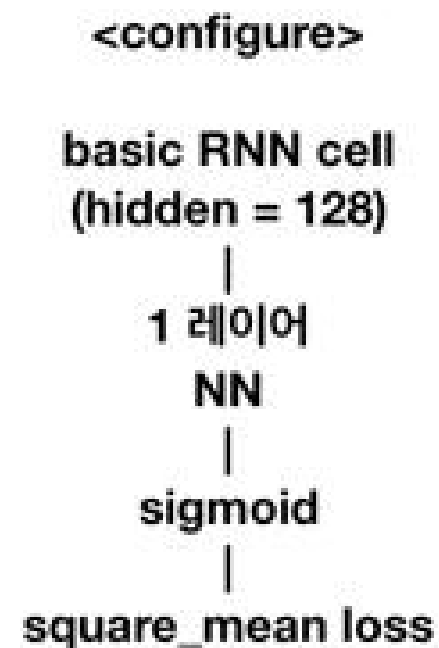
PREDICT

$$\log \left(\frac{p_{t+5}}{p_t} \right),$$

t ~ (t+5)
5분 사이의 return 값

값이 양수로 크면, 투자하면 돈번다
값이 음수이면, 투자하면 손해

논문에서 log return 값 사용

<configure>

첫번째 convolution
첫번째 relu

5,5 filter   64개

두번째 convolution
두번째 relu

7,7 filter   32개

max_pooling

flattening

2 레이어 fully-connected
NN

sigmoid

square_mean loss

<configure>

basic RNN cell
(hidden = 128)

1 레이어
NN

sigmoid

square_mean loss

– CNN을 이용한 모델링   RNN

❖ Result

– Stock Trading

• Worse than random predict

• Test Result 49% ~ 65%

– BlockChain

• Test Result 51% ~ 56%

❖ Reference

– Ashwin Siripurapu, "Convolutional Networks for Stock Trading

– http://stats.krx.co.kr