

Overview of the NTCIR-14 FinNum Task

Fine-Grained Numerical Understanding in Financial Social Media Data

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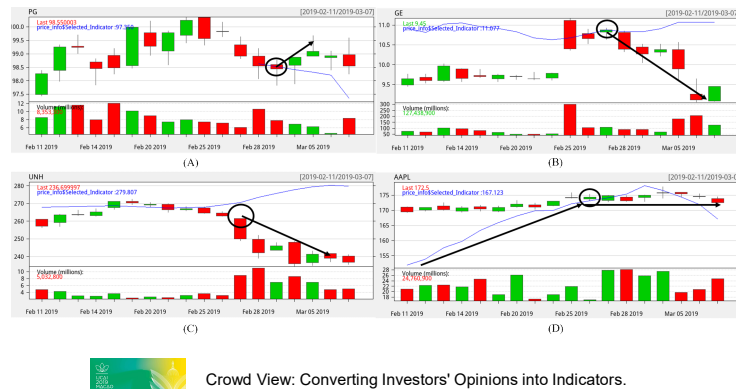
Fine-Grained Opinion on Social Trading Platforms

\$TSLA 256 Break-out thru 50 & 200- DMA (197-230) upper head res (274-279) Short squeeze in progress Nr term obj: 310 Stop loss:239
Bullish

\$AAPL support identified \$198.8 ... next move to \$215
Bullish

\$TVIX making a new 52 week low.
Bearish

Convert Crowd Opinions into Leading Indicator



Numeral Taxonomy & FinNum Dataset

Category	Subcategory	Train	Dev.	Test	Total	Ratio
Monetary	money	2467	261	459	3187	35.94%
	quote	589	52	95	736	8.30%
	change	792	89	152	1033	11.65%
	buy price	143	8	25	176	1.98%
	sell price	319	36	60	415	4.68%
	forecast	103	10	22	135	1.52%
	stop loss	270	33	52	355	4.00%
	support or resistance	25	4	6	35	0.39%
		226	29	47	302	3.41%
	Percentage	relative	838	105	170	1113
absolute		585	70	112	767	8.65%
Option	exercise price	253	35	58	346	3.90%
	maturity date	169	11	22	202	2.28%
		113	5	14	132	1.49%
Indicator		56	6	8	70	0.79%
		167	22	27	216	2.44%
Temporal	date	2364	253	401	3018	34.03%
	time	2079	223	351	2653	29.92%
		285	30	50	365	4.12%
Quantity		741	87	154	982	11.07%
Product/Version		114	14	22	150	1.69%
		6860	753	1255	8868	100.00%

Methods

Features

- Topic
- Format
- Position
- Keywords
- Named Entity
- Brown Cluster
- Part-of-speech
- Term Frequency
- Prefixes/ Suffixes
- Bag-of-Characters
- Numeral Information
- Recognizers-Text Type

Task Setting

- Classification
- Sequential Labeling

Representation

- Skip-Gram
- GloVe
- ELMo
- BERT

Models

- SVM
- MLP
- CNN
- RNN
- RNN + CNN
- Attention-based LSTM

Participants



Experimental Results

Subtask 1			Subtask 2		
Submission ID	Micro F1 (%)	Macro F1 (%)	Submission ID	Micro F1 (%)	Macro F1 (%)
Fortia1 - 1	93.94	90.05	Fortia1 - 2	87.17	82.40
Fortia1 - 2	93.70	88.98	Fortia1 - 1	86.53	80.49
DeepMRT - 1	91.87	87.94	DeepMRT - 1	83.03	77.90
DeepMRT - 2	91.16	84.72	DeepMRT - 2	81.27	75.59
ASNLU - 2	89.72	80.93	aiiai - 1	80.24	74.11
ASNLU - 1	89.40	79.96	aiiai - 2	80.64	73.43
ZHAW - 2	86.45	79.27	ASNLU - 1	79.12	72.51
Fortia2 - 1	89.88	79.26	ASNLU - 2	77.37	70.09
Fortia2 - 2	87.73	78.59	Fortia2 - 2	77.05	68.86
aiiai - 1	86.45	78.09	Fortia2 - 1	79.28	68.33
aiiai - 2	87.41	78.04	ZHAW - 2	75.54	66.44
ZHAW - 1	84.78	75.40	ZHAW - 1	72.67	64.84
WUST	74.02	63.71	Stark - 1	69.08	56.83
BRNIR - 1	74.27	63.53	WUST	60.88	52.93
Stark - 1	78.01	61.75	BRNIR - 1	63.67	51.90
BRNIR - 2	72.91	58.54	BRNIR - 2	61.99	47.14
word-based CNN	55.90	51.67	char-based CNN	43.75	31.12

Error Analysis



FinNum - 2

Semantic Understanding

Numeral Attachment:

\$NE OK NE, last time oil was over \$65 you were close to \$8.
Giddy-up...



Numeral Attachment with Auxiliary Tasks.

Further Directions

Multilingual & Document Level

この論文は、金融市場のニュース記事から、数値の抽出と、数値の文脈を捉えるための方法を提案する。数値の抽出は、数値の抽出と、数値の文脈を捉えるための方法を提案する。数値の抽出は、数値の抽出と、数値の文脈を捉えるための方法を提案する。数値の抽出は、数値の抽出と、数値の文脈を捉えるための方法を提案する。

Learning Numeracy

S&P 500 < SPX > UP 1.53 POINTS, AT
DOW JONES < DJI > UP 8.70 POINTS, AT
U.S. Q3 GDP rises ____ pct



Numeracy-600K: Learning Numeracy for Detecting Exaggerated Information in Market Comments

