

Overview of the NTCIR-14 FinNum Task

Fine-Grained Numerical Understanding in Financial Social Media Data

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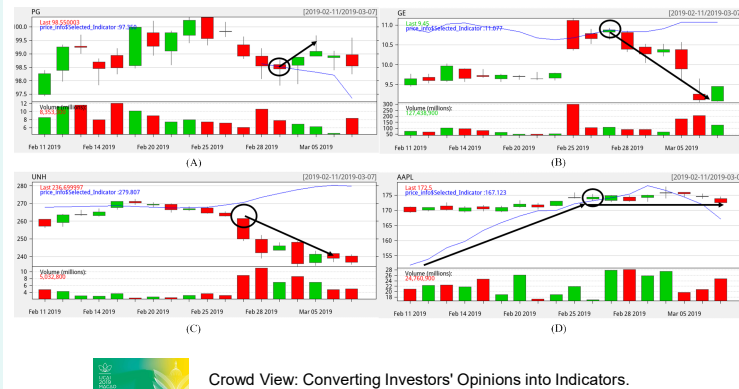
Fine-Grained Opinion on Social Trading Platforms

\$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
Apr 26th, 1:39 am
Bullish

\$AAPL support identified \$198.8 ... next move to \$215
Apr 12th, 7:02 pm
Bullish

\$TVIX making a new 52 week low.
Apr 12th, 7:02 pm
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
Percentage	relative	838	105	170	1113	12.55%
	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%
		114	14	22	150	1.69%
Product/Version		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を抽出し、その文脈を理解するための研究です。数値の抽出は、金融市場の分析において重要な役割を果たしています。本研究では、多言語環境下での数値抽出と、ドキュメントレベルでの数値理解を課題として取り上げました。また、数値の抽出精度を向上させるための新しい手法を提案し、その有効性を検証しました。本研究の結果は、金融市場の分析に貢献するだけでなく、他の分野でも応用可能な技術を開発する上で重要な示唆を与えています。

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

