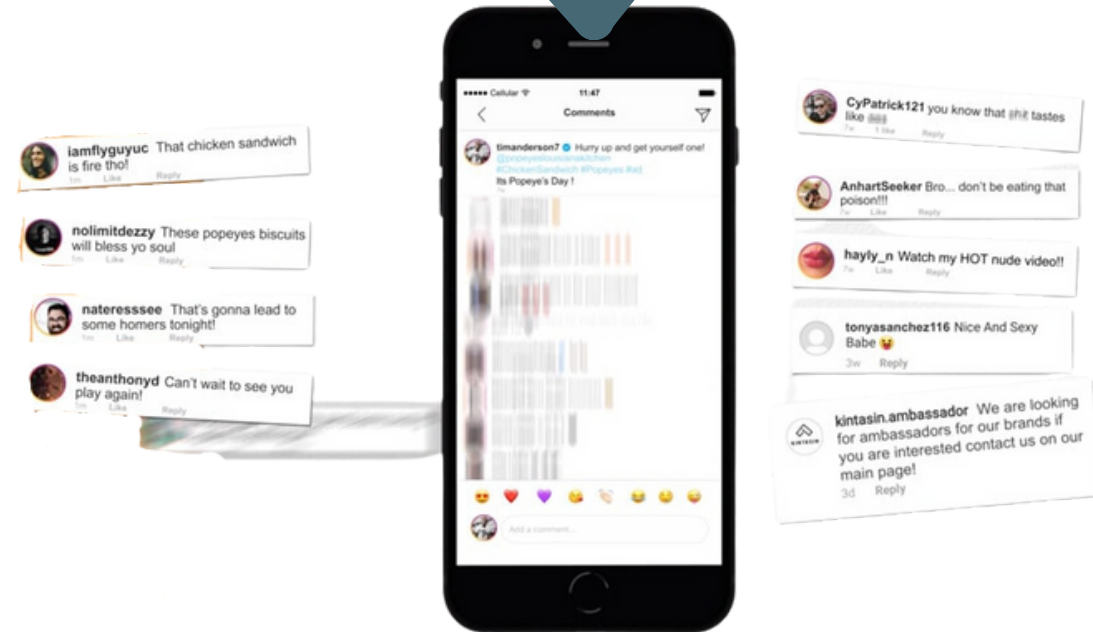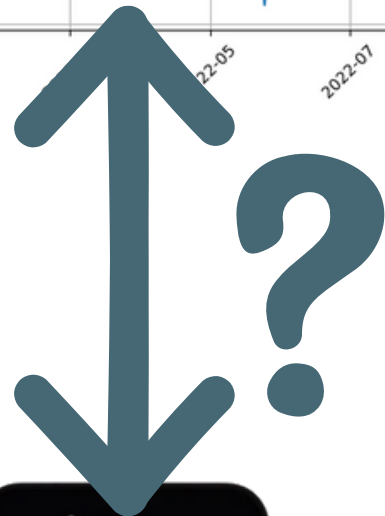# Natural Language Processing

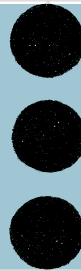Yuen Tak Cheung

Keung Yat Long

Overview

- **Comment** of social media may affect **stock price** of a company
- Analysing **textual content** from social media may brought us **insight**
- **Prediction** may be done by the **relationship** between **comment** and **stock price**
- Case study: **Tesla** as the subject of analysis

Our Dataset

Financial dataset

Date	Open	High	Low	Close	Adj Close	Volume	Stock Name
30/9/2021	260.333344	263.043335	258.333344	258.493347	258.493347	53868000	TSLA
1/10/2021	259.466675	260.26001	254.529999	258.406677	258.406677	51094200	TSLA
4/10/2021	265.5	268.98999	258.706665	260.51001	260.51001	91449900	TSLA
5/10/2021	261.600006	265.769989	258.066681	260.196655	260.196655	55297800	TSLA
6/10/2021	258.733337	262.220001	257.73999	260.916656	260.916656	43898400	TSLA
7/10/2021	261.820007	268.333344	261.126678	264.536682	264.536682	57587400	TSLA
8/10/2021	265.40332	265.459991	260.303345	261.829987	261.829987	50215800	TSLA

30/9/2021	285.709991	287.829987	281.619995	281.920013	278.792847	32343600	MSFT
1/10/2021	282.119995	289.980011	281.290009	289.100006	285.893219	30086300	MSFT
4/10/2021	287.399994	287.75	280.25	283.109985	279.969635	31350700	MSFT
5/10/2021	284.049988	290.399994	284.049988	288.76001	285.556946	24993000	MSFT
6/10/2021	285.779999	293.630005	285.51001	293.109985	289.858673	28002600	MSFT
7/10/2021	295.179993	296.640015	293.920013	294.850006	291.579437	20430500	MSFT
8/10/2021	296.220001	296.640015	293.76001	294.850006	291.579437	17685700	MSFT

• Provide historical stock market data

Tweets dataset

Date	Tweet	Stock Name	Company Name
2022-09-29 23:41:16+0	Mainstream media has done an amazing job at brainwashing people. Today at	TSLA	Tesla, Inc.
2022-09-29 23:24:43+0	Tesla delivery estimates are at around 364k from the analysts. $tsla	TSLA	Tesla, Inc.
2022-09-29 23:18:08+0	3/ Even if I include 63.0M unvested RSUs as of 6/30, additional equity needed	TSLA	Tesla, Inc.
2022-09-29 22:40:07+0	@RealDanODowd @WholeMarsBlog @Tesla Hahaha why are you still trying t	TSLA	Tesla, Inc.
2022-09-29 22:27:05+0	@RealDanODowd @Tesla Stop trying to kill kids, you sad deranged old man	TSLA	Tesla, Inc.
2022-09-29 22:25:53+0	@RealDanODowd @Tesla This is you https://t.co/3Ml1XawSEb	TSLA	Tesla, Inc.
2022-09-29 22:24:22+0	For years @WholeMarsBlog viciously silenced @Tesla critics. Failing to silenc	TSLA	Tesla, Inc.
2022-09-29 22:23:54+0	$NIO just because I'm down money doesn't mean this is a bad investment. The	TSLA	Tesla, Inc.

30/9/2021	285.709991	287.829987	281.619995	281.920013	278.792847	32343600	MSFT
1/10/2021	282.119995	289.980011	281.290009	289.100006	285.893219	30086300	MSFT
4/10/2021	287.399994	287.75	280.25	283.109985	279.969635	31350700	MSFT
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7/10/2021	295.179993	296.640015	293.920013	294.850006	291.579437	20430500	MSFT
8/10/2021	296.220001	296.640015	293.76001	294.850006	291.579437	17685700	MSFT

• Tweets related to stock market discussion

NLP

Natural Language Processing

Enabling computers to understand and process human languages

Application

- Voice Recognition
- Character Recognition
- Natural Language Understanding
- Sound Synthesis

01 Preprocessing

- Sentence Segmentation
- Word tokenization

02 Linguistic Analysis

- Part-of-Speech Tagging
- Text Lemmatization
- Stop word elimination

03 Structural Analysis

- Dependency Parsing
- Noun Phase Chunking

04 Semantic Analysis

- Named Entity Recognition
- Coreference resolution

Sentiment Analysis implementation

Briefly elaborate on what you want to discuss.

Add a main point

Briefly elaborate on what you want to discuss.

Add a main point

Briefly elaborate on what you want to discuss.

Add a main point

Briefly elaborate on what you want to discuss.

Add a main point

Briefly elaborate on what you want to discuss.

LSTM implementation

Result

Add a main point

Briefly elaborate on what you want to discuss.

Add a main point

Briefly elaborate on what you want to discuss.

Add a main point

Briefly elaborate on what you want to discuss.

Add a main point

Briefly elaborate on what you want to discuss.

Conclusion

Add a main point

Briefly elaborate on
what you want to discuss.

Add a main point

Briefly elaborate on
what you want to discuss.

Add a main point

Briefly elaborate on
what you want to discuss.