Situation Analysis
through Image sensor data & Social Media

: Experiment in case of Manhattan
How physical events are reflected on social media?

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Group 5: Members
1. Problem Definition
2. Experiment
3. Analysis
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1. Problem?
Many people tweet about an event.

Can we confirm the reflection through Web Observatory?
Real (physical) event can be detected / predicted by sensing data & social media that involves many people. e.g. parade, protest, concert, etc.
In other words…

Social Event Detection Model through Web images & Social Media
2. Experiment

Target city: Manhattan

Social Media

Tweets about the event by Sentiments from tweets & Hash tags

Sensing data

Surveillance camera images (from 149 stations)
2–2. Architecture

Traffic/Surveillance Images → Image processing → Concept Classifier

Concept Classifier
More than 100 concepts → Detection of a new event

Crawling tweets → Social Media data → Web data

Concept modeling
2-2. Architecture

Traffic/Surveillance Images

Web data

Crawling tweets

Social Media data

Image processing

Concept Classifier
More than 100 concepts

Detection of a new event

Concept modeling

Natural Language Processing

Visualization (Wordcloud, Histogram)

Analysis & Prediction
3. Analysis
3. Analysis Procedure

- **Temporal Change**
  - Before–After effect of the event with Tweets
    - Changes across timestamp
    - Visualization with Cartodb, D3js

- **Concept Mapping**
  - Concept classifier to image with probability model
    - What is the highest peak of concept in each image?
    - Colombia University

- **Word Cloud**
  - Hottest words based on frequency
    - Wordcloud, Histogram
    - Sentiment Analysis
3-1. Image Processing for sensing city

Crowd Density Estimation $\rightarrow$ Density aware event detection
3–2. Social Sensor (Twitter) Analysis

- Confirm Responses/reactions in Social Media (Twitter) using hash tags such as ‘#MillionMarchNYC, #BlackLiveMatter

- Measurement of 5 ranges as follows:
  The response of before-after event is expressed
  Very Negative / Negative / Neutral / Positive / Very Positive
3–3. Sentiment Analysis in Tweets

- Spatial Temporal Analysis
- Movement pattern of the specific event
- Demo
Ground Truth
3–4. Word Cloud based on Frequency

• The hottest word is “millionmarchnyc”, “blacklivesmatter”.
• Do they conform with each other?
Conclusion
4. Conclusion

**Event Detection Model**

Surveillance video images can detect an event in physical world.

**Sentiment Analysis**

By visualizing data, sentiments analysis about an event in social media is expressed with conformity.
Thank you.